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Property Valuation and Market Cycle

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Foreword by Stephen Roulac

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Logic will get you from A to B. Imagination will get you everywhere
Albert Einstein

Foreword: Cycles, Property, and Valuation—Interdependent and Mutually Impactful

Having been integrally involved in the renaissance of market cycles research and practice, initiated a quarter-century ago by the thought leadership exemplified by Stephen Pyhrr organizing a session at the American Real Estate Society meeting in 1994, it is most rewarding to see the energy, ideas, and insights reflected in this collection of provocative chapters by leading scholars, researchers, and practitioners exploring various aspects of valuation in the context of market cycles. While market cycles are an ever-present element of the valuation process, the literature of the market cycles/valuation nexus is less than robust, making this volume a most pertinent, timely, and needed contribution to the valuation and market cycles literature.

Market cycles are very important to the valuation function, for real estate cycles have been a critical underlying reason for the financial successes and failures of real estate investments throughout history. Cycles are a major determinant of success or failure because of their pervasive and dynamic impacts on real estate revenues, cash flows, returns, risks and investment values over time (Roulac, 1996). Indicative of the importance of market cycles is that:

> *More than 50% of real estate research over the 1983–2012 sample period has been devoted to investigating what determines RE prices/values and what—from an investment perspective—causes the related cycles and bubbles.* (Kämpf-Dern et al., 2018, p. 67)

Consequently, it is fully appropriate that market cycles implications be linked to property valuation (d'Amato & Coskun, this volume-b). But that said, the consequences of market cycles—when uncertainty-induced volatility shoves aside perceived-certainty/stability—can be vexing in the extreme to those property professionals whose role is to value properties and property interest (d'Amato & Coskun, this volume-a). Because of growing investor focus on real estate as a distinct asset class that deserves increased portfolio allocations, investors and portfolio managers are placing increased emphasis on the identification, analysis, and decision-making implications of real estate cycles (Pyhrr et al., 1999).

Connecting market cycles to valuation reflects a more expansive and inclusive world view that explicitly incorporates consideration of multiple factors that may inform, influence, and impact market value (Roulac, 1982b). Those with a narrow, rather limited view of the world—which may be characterized as *silo thinking*—may be so self-referential in their approach as to not appreciate the lessons that can be gleaned from other sources and circumstances (Roulac, 1982a). Just as it is a fundamental truism that the most astute strategists, generally, and those engaged in the marketing discipline, specifically, draw the very best of insights from outside their specialized field of emphasis and knowledge domain, so, too, does the same proposition verily apply to directly integrating market cycles considerations into property valuation.

Indeed, a variation of the meaning of cycles—bicycling, specifically bicycle racing rather than such varied phenomena as discussed below in the extracts from the award-winning Pyhrr et al. article (1999)—may offer instructive insights and lessons. To this point, consider lessons that might be learned from the *Tour de France*, the French version of the extraordinary *Giro de Italia.* By studying the lessons of what it takes to succeed in competitive cycling at the highest level, one can gain insights into market cycles, which alpha-seeking investors might most rewardingly employ (Roulac, 2008).

The editors of this volume, Maurizio d'Amato and Yener Coskun, are to be commended for their initiative in envisioning this volume, recruiting a stellar crew of contributors, and orchestrating the collection of chapters that promise rewarding reading for the property scholar and practitioners alike. While market cycles are multifaceted, in the property context their consequences are most often ultimately manifested in capital market pricing, values, flows, and component composites (Roulac, 1978). Indeed, not only can capital market circumstances trigger cyclical market movements, but they can also magnify those market movements. To this point, it is especially noteworthy that the editorial partnership combines Dr. Amato's leading scholarly and applied valuation expertise with Dr. Coskun's capital markets' scholarly and policy leadership.

Core Economic Concepts Matter

Market cycles are the manifestation of core economics concepts and also characterize marketplace phenomena and activity of critical elements of economics: land, labor, capital, technology, and information. While property looms large in the economy—representing more than half of economic activity in the world as well as being the largest personal household expenditure and the second or third largest corporate business expense, plus determining the outcomes of so many aspects of social-economic activities including education, health, and personal relationships (Roulac, 2022)—some property players may not appreciate, generally, and incorporate in their strategies and decisions, specifically, the significance of economics concepts. Too many property practitioners and even some property scholars are

innocent of the implications of what might be considered core economic concepts that motivate and trigger economic phenomena. Economics concepts are integral to the comprehension of property markets behavior, generally, and property performance, specifically. In this regard, property market behavior is interdependent with the concept of market cycles in comprehending property performance in the province of valuation.

The variability of practical performance is often recognized in the context of robust expansion and/or debilitating declines. Too seldom considered is that these two phenomena are interdependent and connected, for they are the essence of the manifestation of market cyclicality in the extreme. While no small number of scholarly research papers and professional practitioner articles may refer to market cycles and/or explore the implications of market cycles in the context of writings on other topics, seldom are the implications of such phenomena explicitly connected to core economic concepts beyond the basic theme of classic supply and demand intersection.

It is instructive to consider the implications of the brilliant discovery of the Italian economist Vilfredo Pareto concerning concentration tendency: the majority of the aggregate productivity of agricultural enterprises being produced by a minority of those 27 agricultural enterprises. In particular, Pareto observed that 20% of the agricultural enterprises in a particular place accounted for 80% of the aggregate agricultural production (Pareto, 1896).

Pareto's great contribution, which has become popularized as the so-called 80/20 rule—meaning that 20% of the elements in a set would account for 80% of the product or value and 80% of the elements would account for 20% of the product or value—can be applied in multiple interests and circumstances including, most specifically, property. Pareto's teaching—that a small proportion of an activity or asset accounts for a disproportionate share of the aggregate volume and/or value of that activity and of that asset class—is appropriately considered to be a foundational premise of market cycles.

The motivation for applying Pareto's insight to the pattern of financial flows is the teaching that a high proportion of value gain is concentrated in a few years, where a high proportion of value lost may be concentrated in even fewer years. Extending this point, for financial flows extending over some 10–20 years, gains may be concentrated in several or only a few years, perhaps 3–5, whereas losses are likely to be more evenly concentrated perhaps every 2–3 years. In many investments, in the majority of years financial flows may tend to be flatter and, generally, modestly increasing or decreasing. This follows because changes in cap rates tend to be somewhat modest on the upside, but extreme on the downside, while changes in cash flows tend to be very strong on the upside and more modest on the downside. Companies gaining market share and greater profitability are simultaneously in a position to have greater prospects to capture new customers and also to have more.

The financial physics of market cycles in the application is that recognition of major change patterns and the reaction to that recognition tends to be concentrated in a discrete time interval. These time intervals represent a limited slice of a longer duration of a broad trend of economic activity, generally, and in relation to investing

horizons, specifically. Connecting this insight to market cycles patterns, significant change—both positive and negative—occurs in a compressed time. This is in sharp contrast to the long-term horizon of broad economic trends and extended investing time horizons. The very time character market cycles mirror Pareto principles concentration patterns.

Cycles Are Pervasive and Ubiquitous

Cycles are pervasive and ubiquitous, touching upon and affecting virtually every aspect of nature, the unbuilt environment, the built environment, the economy, and society. Cycles embrace patterns of behavior that repeat and are recurring. That said, such patterns—as distinguished from one-time events and/or fundamental realignments—are more readily perceived and comprehended after the fact than in real time. It is far easier to recognize market cycles after the fact than to apply this insight in real time. To this very point, a dramatic market crash and major downturn in the mid-1970s real estate market reflected a pattern of market cyclical behavior which at that time was not readily recognized (Roulac, 1975, 1976).

Recognizing cycles involves discerning the distinction between (1) the anticipated repetition of circumstances and events and (2) a pattern continuing until those patterns change. Sometimes such a pattern change may be modest; other times it may be significant. Some cycles are mild; others are extreme. Some cycles are characterized by exuberance, others by despair. At varying times cycles may manifest profound changes and at other times inertia. In this regard, recent events on the health front have provided society broadly—in every circumstance, in every context, in every place—a highly impactful, first person, empirical experience of cycles. An appreciation of cycles is integral to comprehend societal health circumstances and well-being conditions at any point in time.

As one of the many phenomena characterized—even defined—by cycles, health domain challenges have heightened policy makers' and the public's awareness of the ubiquity and persistence of cycles. Within the health front, at different times of the year many of these trigger certain recurring health challenges while other health challenges may not occur annually, but from year to year, decade to decade. On the larger scale, the health challenge of a pandemic impacts large numbers of people broadly—not situationally concentrated in a single place, but extending to many places with much harsher and much more pervasive consequences.

Cycles are not confined to real estate and health care, for as Pyhrr, Roulac, and Born observed, cycles are both everywhere—in nature and beyond—and interdependent:

> *Among the dynamic cyclic patterns that have repeating and predictable behavior are a quartz watch crystal vibrating 10 billion times a second, an Ice Age every 100,000 years, the Milky Way spinning on its axis every 200 million years, as well as the sunrise, sunset, the new moon, the full moon, high tide, low tide, heartbeat and seasons. Other cycles that occur in the same place, and offer again and again, but do not recur in any set time period include earthquakes, floods and forest fires.*

Comprehension of cycles, specifically understanding, planning for and exploiting predictable cycles concerning the food supply, was central to the emergence of hunting and gathering societies and their location decisions. Basic, then, is to understand that "a cycle is a sequence of events that repeat," Consequently, the capacity to perceive events as susceptible to repetition as opposed to being isolated, random and non-recurring is crucial to coping with nature, political economy, business and investing.

With growing contemporary interest in both history and futurism, reflected by an interest to learn lessons of the past and comprehend the implications of change, cycles are central to effective functioning in a contemporary world. Indeed, cycles are basic to such diverse involvement as surfing—the tide cycle; dairy farmer—weather, seasonal milk production and daily milking; and music—coherence, rhythm, the tonal system cycle from rest to complexity to return to rest.

Cycle impacts from space (the solar system), the Earth's atmosphere and the Earth itself are manifested as forces that affect the physical environment in which we live. Changes in the physical environment, in turn, affect human behavior and economic activity. Human behavior and economic activity affect supply and demand forces in the real estate markets, which in turn affect the financial performance of properties through changes in rents, vacancy rates, operating and capital expenses and capitalization rates, Changes in financial performance, which are caused by these external forces, are measured through rate of return and risk analysis, which are the key parameters that determine rational investment decisions. . . . Most of all of the physical forces from the solar system to Earth to our immediate physical environment are cyclical, then it is logical that property performance is also cyclical. (Pyhrr et al., 1999, p. 9)

Beyond the pervasive evidence of cycles in nature, many facets of life, and the built environment, cycles have profound impacts on property involvements (Pyhrr et al., 1999).

The meaningfully superior business performance of the 20% of enterprises accounting for 80% of the productivity may be directly linked to enterprise scaling. To this point, enterprises producing a disproportionate share of total output, relative to the universe of all such enterprises engaged in that activity, are most often larger than those enterprises producing a lower value of output.

These consequences of growth being derivative of greater experience have been analytically considered. In particular, enterprises are larger because they have successfully expanded their business, and successful business expansion concurrently leads to and is the derivative of more experience being in business. More experience is commonly perceived as both a source and indicator of greater competence, and this perceived greater competence attracts more customers and therefore higher revenues, plus greater competence leads to both business decisions and actions characterized by superior acumen and more revenue. Thus, more experience, greater competence, and superior decisions are the explanatory foundation for the Pareto insight known as the 80/20 rule.

It has been determined that greater experience leads to performance improvement of a 10–30% reduction in costs, linked to business volume doubling. Bruce Henderson and the Boston Consulting Group (BCG) branded this phenomenon of margins increasing as business revenues grow "the experience curve" (Hagel et al., 2009).

Significantly, the BCG *experience curve* was advanced contemporaneously with what has come to be known as the highly influential *Moore's Law*. Gordon promulgated in 1965 by Intel co-founder Gordon Moore who postulated that the number of transistors in a dense integrated circuit doubled initially every year, which productivity pace was then revised to every 2 years, and subsequently specified as 18 months (Moore, 1965).

Distilling the learnings from numerous studies across multiple industries, Bruce Henderson noted that the study of price and cost data led to the discovery that costs decline by some characteristic amount—consistently 20–30%—each time production volume doubles (Henderson, 1988). Henderson observed that this cost decline is realized regardless of the company's rate of growth, or cumulative experience, and is surprisingly consistent, across different industries (Henderson, 1988). Henderson asserted that the fundamental relationship between cost and experience is supported by "a large amount of empirical evidence" (Henderson, 1968).

This experience curve phenomenon reflects the consequences of the following:

- *Sustained time in business can lead to expansion of business volume.*
- *Ever higher profit margins are realized concurrent with larger production scale.*
- *Companies that expand achieve meaningful business economics advantages—specifically, lower costs—over those that do not.*
- *Greater market share leads both to pricing power and also competitive advantage, leading to prevailing in competing for new sales and new customers.*
- *The business expansion that leads to lower costs therefore results in higher margins, the outcomes of which combine to reflect superior business performance, evidenced by higher market share and higher profitability relative to other companies operating in the same sector.*

Cyclical or Transformational?

Crucial to the effective application of the implications of market cycles insight to decision making and to valuation is discerning whether particularly notable events—specifically, events of great consequence—are part of a recurring pattern or a *new thing* (Roulac, 1975, 1982a). This very challenge is reflected in commentaries concerning what life post-pandemic might be like. Some expect a "return to normal." Others anticipate that what is to come in the future might never be quite the same as the past: such expectations might be framed as a self-fulfilling prophecy of a positive, better "new normal." A third group holds the perspective that such changes are not from status A to status B, but rather that recent events are not just a precursor to a new set of circumstances, but prospectively represent both a multiplicity of changes and continually changing circumstances, which lead to anticipation of the "next normal."

Because of their pervasive and dynamic impacts on real estate returns and risks, real estate cycles have a significant impact on the financial success and failure of real estate investments.

> *Once an essential component of the real estate body of knowledge, real estate market cycles declined in stature in the later decades of the 20th century, until Pyhrr led a renaissance of interest, through panels at ARES meetings and a series of papers, coauthored with colleagues including Born, Roulac, Webb and Mueller.* (Roulac et al., 2016)

Contextual perspective, insight, and acumen are critical to distinguish between cycles and change, repetition and new direction, continuity and discontinuity, consistency and transformation (Roulac, 1996). Applying the implications of market cycles requires facility to distinguish between patterns and the "new, new thing." To this point, an article in the *Journal of Real Estate Portfolio Management*, addressing striking an informed, reasoned balance between the recurring patterns of cycles and fundamental changes, noted:

> *Effective real estate investing depends to a very large extent on understanding real estate market cycles, transformation forces and structural changes. The essence of real estate portfolio management is crafting strategies that reflect insights into and the appropriate differentiation between (1) the cyclic phenomena (that may be expected to recur, albeit in perhaps different forms); (2) forces that transform society's relationship to place and space; and (3) structural changes that are both different from what has been before and also long-lived and profound in impact. Differentiating market cycles, transformation forces and structural change from trends that may reflect a nonrecurring, short-lived pattern of preference or activity is basic to effective real estate portfolio management.*
>
> *In practice, the concept of real estate market cycles is usually used more to support self-serving assertions of probable market recovery than to guide future real estate investment decisions. Misperceiving the implications of past real estate cycles, the majority of market participants craft strategies relying on past trends as continuing unabated. Investors who fail to understand the changes in future real estate cycles may therefore make decisions that are suboptimal, if not dangerous.* (Roulac, 1996, p. 1)

Drawing the distinction between patterns and the "new, new thing" is daunting, for the interactions of multiple traditional factors may challenge the identification and evaluation of underlying causal forces for:

> *The condition, activity and direction of change of the multiple and divergent real estate markets are influenced by a multitude of cyclical forces. Sometimes many market segments move in a common direction, while at other times, some market segments thrive at the expense of others.* (Roulac 1993, p. 27)

These considerations influence the implementation of applied valuation analytics that inform decisions, financial reporting, and professional work, as assessments of particular assets, interests, and enterprises may be:

- *One time or ongoing*
- *Formal or informal*
- *Impressionistic or rigorous*
- *Narrow or broad in scope*
- *Internal or external*

- *Explicit or implicit*
- *Unstructured or structured*
- *Conceptual or specific*

Such varied considerations are more saliently and efficaciously considered from a strategic perspective, considering systems interdependency, rather than a pure transactional trade orientation, which by its very nature may be narrower and less encompassing in determining which factors should appropriately be taken into account (Roulac, 1977). To this point, Pyhrr, Roulac, and Born observed:

> *A number of authors have addressed the strategic importance of measuring the dynamic impacts of cyclical economic factors on real estate investment performance. In a classic prescriptive article, Roulac (1982) recited a litany of changes during the 1960-1980 period including volatile inflation and markets, increasing complexity of financing mechanisms, shifting national markets and the internationalization of markets combining to produce increased economic uncertainty.* (Pyhrr et al., 1999, p. 18)

Operationalizing the implications of these change forces may be enhanced by "including real estate cycle considerations in the analysis of real estate investments" (Pyhrr et al., 1999). Though many may perceive that operationalizing the implications of change is daunting, in fact such considerations can be addressed through a market forces model, as Pyhrr, Roulac, and Born posit, for the:

> *Roulac Market Forces Model vividly illustrates that and considers multiple perspectives of major capital sources, including pension funds, financial institutions, foreign investors, securities and corporate investment, and their implications of space users, real estate services providers, developers and the public sector....* (Pyhrr et al., 1999, p. 51)

The Roulac Market Forces model promotes:

> *... understanding of the interconnectedness of the multiple cyclical forces that determine real estate market results. For each of six four-year periods, from 1972 through 1995, eight basic measures of real estate markets, including the overall economy, office demand construction, property values, volume of transactions, debt capital available for speculative real estate, equity investor interest and tax incentives, were address.* (Pyhrr et al., 1999, p. 51)

To address whether an event is a recent element of a cyclical pattern or a transformational change requires initially recognizing the event, then comprehending its causal forces, next comparing the event's causal forces to prior experiences, and finally assessing the inherent character of that event and its consequences. That this is no small undertaking explains why disregarding whether events are cyclical or transformational is often favored over explicitly grappling with such a dauntingly difficult mental challenge.

Real Estate Cycles Decline and Renaissance

Market cycles is a mainstream topic and theme of interest to practitioners and scholarly researchers alike as of the third decade of the twenty-first century. Those not schooled in the complexities of property practice—most specifically, analytics, deal-making, and investing—may not recognize that this circumstance has not always prevailed. Students of market cycles recognize that there are cycles of interest within cycles, for the very field of cycles is itself subject to secular forces. Although market cycles in earlier years of the twentieth century was an important specialty topic within the broader property discipline, in the years following the Second World War, the very momentum and upward direction of markets caused people to have the perception that property values moved only in one direction (Roulac & Barr, 1973).

Indeed, an important writing—recognized as the definitive research paper in contemporary times concerning market cycles—noted the presence of cycles within cycles (Pyhrr et al., 1999). Not only are there real estate cycles broadly considered, but there are also notable cycles within the academy, specifically concerning market cycles research. The paper, recognized as the winner of the Best Manuscript in the Real Estate Cycles category at the 2013 American Real Estate Society (ARES) Meeting, addressed this very question: "Is there a market cycle in market cycles research?" (Roulac et al., 2016). A comprehensive study of all papers presented to scholarly research societies from the mid-twentieth century into the twenty-first century detected some very illuminating insights into the patterns of market cycles research over time:

> *Real estate cycles research indeed is cyclic, with multiple cycles: cycles over time, by geographic region/society, by property type focus, cycles linked to specific economic events such as overbuilding and the recent financial crisis, etc. Overall, cycles research is growing.* (Kämpf-Dern et al., 2018, p. 76)

Prior to the mid-1990s, the subject of market cycles was largely out of favor in property markets, among property practitioners, generally, and within the academy, especially. Stephen Pyhrr's role in supervising the PhD thesis of Wally Born at the University of Texas, Austin, coupled with his successfully employing market cycles in his professional work in the Texas real estate market in the 1980s and early 1990s, prompted his initiative to proselytize the importance of market cycles—beyond his own investment company's work—through initiating a Market Cycles Panel session at the 1994 meeting of the American Real Estate Society. Pyhrr's initiative was most prescient: the attendance at that particular panel was by far the largest of any session not only at that particular ARES meeting but for virtually any scholarly academic meeting ever. That standing-room-only session was followed by a series of papers that extended and expanded market cycles research, both at scholarly research meetings and in published articles in leading journals by Pyhrr, Roulac, Born, and others (Pyhrr et al., 1999). In this regard:

> *A landmark in the development of theoretical and applied research on real estate cycles was the collection of cycle articles that appeared on the subject in a special issue of the* Journal of Real Estate Research *(Volume 18, Number 1, 1999), and authored by a variety of*

> *individuals, including Pyhrr, Born, Webb, Roulac, Mueller, Laposa, Grissom, DeLisle, Tsolacos, Mejia, McGough, Kummerow, Dokko, Edelstein, Lee, Bjorklund, and Söderberg. The lead article in that issue advanced the idea that there are cycles of interest in real estate cycles.* (Kämpf-Dern et al., 2018, p. 44)

To provide guidance to the proliferating interests of scholars in cycles research, Pyhrr, Born, Manning, and Roulac advanced a taxonomy of cycles to organize the body of knowledge of cycles research concerning the multifaceted nature of cycles (Pyhrr et al., 2003). Notably, in that paper the authors observed:

> *A taxonomy of place, property and real estate is needed to bring clarity to the discipline, and thereby to serve the needs of all those who have property involvements and interact with the property process. In particular, the taxonomy is needed to guide teaching and research, to guide decisions by and about the emerging real estate dotcom and e-commerce companies, and to guide those who would understand the role of property in an e-business world . . . The real estate discipline currently lacks coherence and consensus about what the essence of real estate is and what the operative paradigms are for comprehending and making order of the discipline.* (Pyhrr et al., 2003, p. 2)

A subsequent comprehensive study of market cycles research by Kämpf-Dern, Roulac, and Pyhrr documented the substantial uptick in market cycles by property scholars and researchers (Kämpf-Dern et al., 2018). As noted by Kämpf-Dern, Roulac, and Pyhrr:

> *Cycles research has . . . gained overall importance over time. . . . While overall real estate research in 1983–1992 grew much stronger than cycles research in 1993–2002, cycles research steadily grew at approximately the same rate as overall real estate research . . . .* (Kämpf-Dern et al., 2018, p. 59)

> *The absolute peak of cycles research was reached in 2009 with 74 papers. In total, the 2003–2012 period with 513 cycles papers (and thus 51 papers presented on average) accounts for 70% of all cycles research, thus even outpacing the overall share of the real estate represented by scholarly meetings' presentations during the same period. This greater incidence of cycles research suggests that researchers (in general) respond to rapidly changing market phenomena, focusing more on the causes and consequences of real estate cycles, which mirrors the overall cycles of economic and real estate activity.* (Kämpf-Dern et al., 2018, p. 60)

From being long neglected, market cycles research in the twenty-first century accounted for some 5% of scholarly research:

> *Overall, cycles research represents 4.8% of the aggregate of real estate research produced globally during the 1983–2012 period, with 5.2% during the 2003–2012 period, with ups and down in response generally to regional and global cycle conditions.* (Kämpf-Dern et al., 2018, p. 67)

In view of the renaissance of interest in property cycles by scholarly researchers, this volume is most welcome and timely.

Appraisers Treat Both Highest and Best Use and Market Cycles with Benign Neglect

Notwithstanding that over the last quarter-century market cycles have evolved to be a primary focus of interest within the academy and for property researchers (Kämpf-Dern et al., 2018), valuation practitioners have been less inclined to include explicit consideration of market cycles in implementing valuation reports. Valuers confining their analytics to a single year of projected property performance, both explicitly and implicitly, is an important reason that market cycles are not prioritized in many valuation reports. Appraisers valuing a property on the basis of a one-year projected financial statement would necessarily consider market cycles only implicitly—or not at all.

If a multi-year financial model is employed, often an appraiser will presume a constant rate of change—most prevalent upwards rather than downwards—of revenues and expenses, and this presumption in the application is an implicit rather than explicit consideration of market conditions (Roulac, 1977, 1982a). Necessarily, such an approach reflects the anticipation that market behavior is linear, one-directionally consistent rather than cyclically variable, meaning that the change path of revenues and expenses may vary in both pace and direction (Roulac, 1982a).

Market cycles in the context of valuation tend to be treated by property valuers in the same way that the highest and best use (HBU) concept is addressed in preparing an appraisal report, for benign neglect dominates explicitly considered calculation (Kämpf-Dern et al., 2018). Given that valuers and appraisers tend to address the two critical elements of property valuation—use of the property and the cyclical character of markets—in similar ways—neglect or implicit rather than considered and explicit—it is instructive to explore the premises and consequences of how appraisers approach the use aspect of property. Doing so offers a window into the inclination toward directly adopting the role of market cycles in property valuation.

As a practical matter, the vast majority of appraisers default to an implicit interpretation/conclusion that the property's current use is its highest and best use. Reliance on this heuristic is often motivated by the objective to circumvent the resources and time required for more thoughtful consideration of property use, essentially defaulting to the proposition that the property's present owner would of course make the best decisions.

This stylistic premise that the current use is the best use defaults to a position anchored in the once widely embraced—yet now recognized as quite dubious—proposition that rationality governs decisions with economic consequences and that market efficiency characterizes the market context in which such decisions are made (Roulac, 1985). The thinking goes that the current property owner is presumably responsible, reason-based, and resourceful in doing what is best for the property. Consequently, the condition of the property at any one point in time presumably reflects the best thinking of the property owner concerning that property. The line of reasoning in the immediately preceding sentence essentially reflects the implicit

presumptive application of the theory of efficient markets to property decisions (Roulac, 1985).

The efficient market thesis—initially conceptualized and commonly thought of in the context of tradable corporate securities (Roulac, 1976)—holds that:

> *In an active market buyers and sellers continually seek to determine whether there is an opportunity for gain by buying or selling a particular security.* (Roulac, 1985)
>
> *The collective interaction of the decisions by thoughtful, motivated, engaged market participants determines the fair/reasonable price for a particular security.* (Roulac, 1985)
>
> *If a market participant at any time perceives a security is undervalued, that market participant would buy and thereby bid up the price of that security. That market participant presumably would continue to do so until that security was fairly valued.* (Roulac, 1985)
>
> *If a market participant were to perceive that security was overpriced, then that investor would be motivated to sell that very security (A) that they owned in their portfolio or (B) borrow and then sell that security in a short sale transaction. In the former instance, the sale of the security from their portfolio is motivated to avoid a prospective loss. In the latter instance, that short sale transaction is motivated by the opportunity to profit from a perceived price/value divergence that others in the market have yet to recognize.* (Roulac, 1985)

The very character and function of the corporate securities markets can be viewed as a behavioral form of *crowd machine learning*, as much as collective activity and experiences over time improve the decision making of the crowd. In the technology realm machine learning leads to superior applications and practice, for just as people learn from what has been done before, strategy consultant BCG promoted the concept that an enterprise's cumulative experience can lead to competitive advantage theory, to lower costs and to superior quality.

The premise of *machine learning* is that *technology of machine learning* is facilitating some analytic process from its prior analyses, and predictions over time develop more accuracy and insights. While this phenomenon may apply in certain contexts—specifically those characterized by linearity rather than dynamic discontinuance functions—the transferability of those premises to property markets is problematic, for property markets are dynamic and periodically discontinuous, as manifested by unanticipated fundamental changes and/or unrecognized market cycles.

Applying the above line of thinking—pertinent to the attributes of securitized interests—to non-securitized property interest is problematic. Whereas the fungibility of corporate securities—meaning one share of a class of shares of a corporate enterprise's stock is the same as all other company shares of that same class—facilitates the division of ownership of a company into multiple, discrete parts, a non-securitized asset such as property is monolithic. The consequences of this monolithic character of non-securitized property are that transactions of that property necessarily are binary, for in the vast majority of instances, you buy or sell the totality of the property, not a discrete part of that property (Roulac, 1972).

Through the mechanism of securitization many knowledgeable, motivated investors may own shares of any one company. Absent securitization, one or very few individuals could own an interest in a particular property. Therefore, the universe of those who could and would be interested, engaged, and involved in price—seeking that particular property, if that property is owned in non-securities form—is much smaller.

Though emotions can cloud and may influence approaches to all investing activity, emotions in the property sector tend to be more pronounced than might apply in corporate securities. Consequently, the behavioral finance phenomena that apply in the corporate securities markets may apply even more profoundly than in the property markets. Property pricing, then, reflects fewer property participants' lower level of analytic sophistication and greater behavioral influences. As with most things and phenomena, behavior may be cyclical. Cycles most significantly apply in the behavioral realm: behavioral factors are reflected in cycles, as well as the magnitude and direction of patterns in the repricing and activity of physical goods and enterprises.

Cycles Applications Lag Cycles Insights

The editors are to be commended for producing this collection of chapters that represent an important contribution to recognizing, addressing, and bridging the gap between property valuation and property market cycles (d'Amato & Bliozor, this volume). Appreciation for the research and commentaries that comprise this volume may be enhanced by considering the fundamental institutional structural aspects that contribute to this gap between property market cycles and property valuation.

The scholarly research and textbooks advocate a more comprehensive assessment of a property and each component thereof, not merely in the current time horizon but over a multi-year model. In particular, Pareto observed that 20% of the land accounted for 80% of the aggregate of all of the land in a particular place. Notwithstanding this teaching, appraisal practice has evolved to reflect a fast, expedited production approach, derivative of modest budgets and tight client delivery time frames. Consequently, as a practical matter the valuations of many income properties are considered from a one-year perspective. To this very point, the income statement—the basis for valuation analytics that represents investors' calculations that inform buy-and-sell decisions and therefore determine property values—necessarily is a one-year depiction intended to reflect the appropriate representation of current circumstances. Market conditions, rents, and occupancy as well as expenses are translated into a simplified one-year number set distillation presumptively representative of the projected performance of the subject property.

Not uncommonly, those valuing a property—for internal decision purposes or a third-party and professional appraisal—consider that interest, averaging rents, occupancies, and expenses are a *good enough* representation of the market conditions intelligence that informs rents, occupancy, and expenses, and therefore are employed

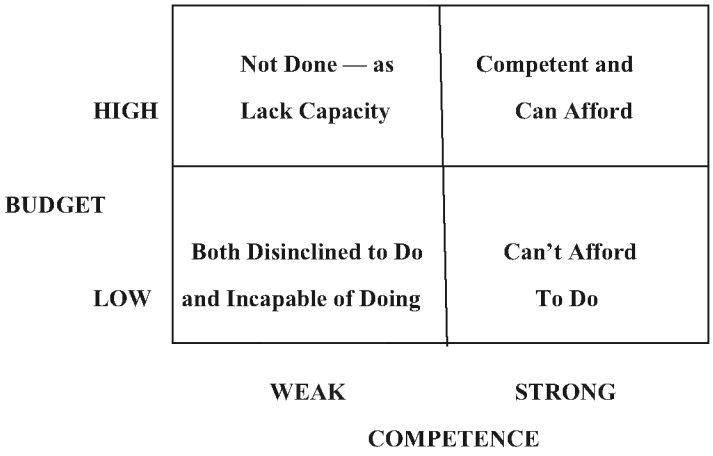


Exhibit 1 Institutional challenges to thoughtful property analytics

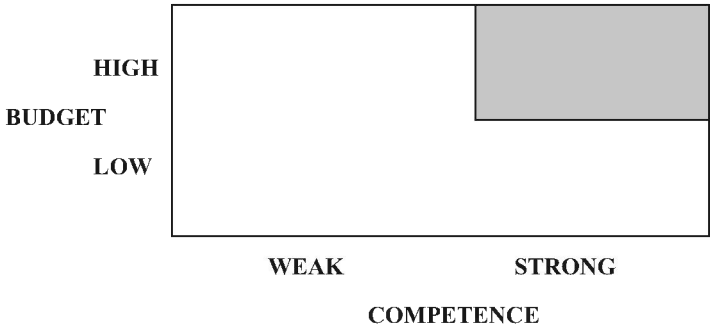


Exhibit 2 Thoughtful/sophisticated property analytics actually implemented is limited

in preparing the provisional financial statement upon which the appraisal is based. Unavoidably, a one-year income capitalization valuation methodology must necessarily be implicit rather than explicit, concerning the integration of market cycles into the valuation process. In such circumstances, market cycles are seldom addressed, let alone explicitly applied.

Applying market cycles for many appraisers is particularly vexing, especially for those with a heavy assignment schedule, limited resources to fulfill those assignments, and modest budgets for any one engagement. Thus, the combination of personal training, delivery schedule, pressure, and modest budgets motivates a *streamlined, get-it-done-fast style*, which does not allow much time for investigation, reflection, and the forecast of probable futures. And even so, not so many appraisers/valuers may be inclined, trained, capable, and skilled to produce more probing, sophisticated, comprehensive analytics. Consequently, the majority of multi-year financial forecasts tend to apply common assumptions concerning the

pace, direction, and magnitude of change for critical model factors, specifically rents, occupancy, and operating expenses.

In the vast majority of circumstances, the central question is what magnitude of positive changes might be anticipated, for very seldom is the prospect of projected future operating performance declines insufficiently considered by valuers. The premise of the current year being representative of all other future years, as well as the propensity of valuers and analysts producing multi-year financial models to show consistent patterns of change over time in key forecast elements, reflects the innocence of how market cycles intelligence might appropriately be employed to implement valuation assignments (d'Amato, this volume-c).

Certain property valuers and analysts aware of the significance of market cycles might choose—for reasons of convenience, budget, client expectations, etc.—to disregard the role of cycles in property valuation. Others might directly incorporate property cycles insights in making some implicit, informal adjustment of the discount rate and possibly cash flow factors as well. A select group of valuers and analysts may actually elect to produce professional work informed by property market cycles intelligence. Such an approach to developing an explicit model of how the future might apply involves modifying each of the key elements of the financial assessment to reflect how:

- *Critical financial metrics may change in different directions—sometimes positive and sometimes negative*
- *Different elements of financial metrics may reflect different magnitudes of change—sometimes small and sometimes large*
- *Number patterns in some years may be flat and in other years may not be*

To implement analyses that reflect changes in direction and changes in magnitude resulting in projected financial flows being sometimes flat and sometimes changing requires much more analytic intention, initiative, and professional competence than are characteristic of a large segment of property valuers and investors, and researchers. Truth be told, not all property analysts and appraisers possess the analytic competence to produce the same thoughtful, diligent, nuanced property analyses as described above.

Those choosing to extend their analytic horizon beyond the current year choose between an analytic *make-or-buy* and a *free-ride-borrow* option as follows:

- *The* make option *of preparing their own original forecast*
- *The* buy option *of sourcing the numbers for probable future property performance from a research service forecast*
- *The* free-ride-borrow option *involving consulting multiple research services concerning their cycles insights and predictions*

In this regard, in implementing the implications of market cycles insight, the valuer combines the roles of data collector, model interpreter, and numbers mechanic to derive a value.

In a comparably small set of those who do possess such capacity, the opportunity to proceed with the most sophisticated, professional analytics work is often limited

because of budget constraints. Customers of sophisticated property analytics services providers—those leading property analysts who by their inclination, talent, team, resources, and capacity to attract clients favor and willingly pay for more thoughtful and resource-intensive assessments—recognize that such sophisticated analytics approaches—employing discrete, explicit, period-by-period data plus analytically informed specification of each salient maker of multiyear market models—are more likely to produce forecasts that represent actual future performance (Roulac, 1979).

The conditions and their associated implications, as described above, may be considered in the context of variations between budget and competence in a basic 2X2 Logic Matrix reflecting *budget, low and high* on one axis, and *competence, weak and strong* on the other axis, whose relationships are depicted in Exhibit 1.

As shown in Exhibit 1, circumstances of limited budget and competence can lead to neglect rather than the artful application of a thoughtful property analysis. Many engaged in property analytic work lack the competence to do more sophisticated, analytically demanding property analysis or would not even think to undertake such more advanced analyses. Strong competence may be frustrated by a limited budget, leaving only the narrow set of circumstances in which a high budget is matched to strong competence to deliver superior analytic reports and professional work. This reality is depicted in Exhibit 2.

This perspective of Exhibit 2's budget/competence interaction practice, as shown in the gray shading reflecting the practical reality of property analytics, depicts the paucity of thoughtful property analytics work that is actually implemented. In Exhibit 2, the empty/white space represents the reality that the majority of property analytics actually undertaken does not exemplify an advanced thoughtful and sophisticated approach. The shaded space reflects the limited share of property analytics that exemplifies an advanced thoughtful and sophisticated approach. Thoughtful property analytics represents such a small share because the vast majority of property analysts are not sufficiently competent to do more analytically challenging work, few clients recognize the value of superior property analytics, and few clients are actually inclined and able to budget for such work.

The inevitable implication of budget, constraints, and competency limitations for properties is that many property decisions are based on less than competent financial analytics for:

- *Lesser competence dominates strong competence.*
- *Low budgets dominate high budgets.*
- *Most investment decisions are based on limited-quality analytic work rather than high-quality analytic work.*

Given the less than impressive status of property analytics applications, it is most pertinent to recognize that disciplined sophisticated property analytics—informed by market cycles insights—can facilitate capital commitments enabling projects to proceed that would not be green-lighted if more stringent evaluation criteria were to apply. Thus, lenders make loans on properties with less property information than might be available were certain professional property services performed and their

results provided. These circumstances combine to exacerbate lenders' and investors' risks.

Lacking more pertinent, higher-quality professional analytics, decisions concerning capital commitments appropriately are based upon more cautious, conservative criteria than might apply were such decisions informed by a higher level of professional property analytics. Lenders' caution in conservatism may be derivative of general thinking to provide a margin of error in a financially responsible, fiduciary context; implicit risk aversion; or informed response to the institutional realities of property market function and competitive considerations. One outcome of this approach is that property market function, pricing decisions, and financial economics of all market participants are compromised rather than optimized.

These outcomes follow from the consideration of the easy availability of capital. This stimulates new building construction that might not be justified were that decision subjected to an informed, professionally competent analytics assessment that appropriately considered market cycles. Concurrently, high capital costs and less than accommodating constraints and restrictions on capital access may limit availability of capital to new development ventures, which, in other circumstances, might readily be financed.

Lenders may hedge their lending bets, either informally and implicitly or by consciously applying knowledge learned through less than pleasant experience:

- *Sustaining loan losses from properties that were collateral for mortgages failing to pay scheduled debt service on a timely basis*
- *A shortfall in mortgage debt service payments actually collected, relative to scheduled mortgage debt source payments*
- *The property representing the collateral security for the mortgages ultimately failing to have sufficient value to repay the mortgage indebtedness*

Lenders may hedge their lending bets through building a *margin of error* into their funding decisions concerning loans that those lenders might reasonably wish to finance, given that the information available to make the lending assessment is less robust, reliable, and rigorous than it might be were more competent property valuations performed. Thus, borrowers may not achieve as favorable financing arrangements—in terms of pricing, Loan To Value (LTV) ratios, and loan terms—as would apply absent the sense of caution applied by lenders, collectively, leading to underwriting criteria.

Such primitive, restrictive lenders' underwriting guidelines—in which extreme conservations substitute for informed analytic sophistication and application—coupled with very difficult capital access conditions can frustrate the best-intentioned projects supported by analytics that document most professionally prepared, property market-justified ventures by denying their promoters and sponsors the essential *mother's milk of property development:* the requisite capital needed to fund their projects.

Integrating the themes discussed above concerning analytic sophistication and lenders' underwriting standards underscores the interdependency between property market cycles and lender decision processes (Roulac, 2000, 2019). This

interdependency of lender attitudes and analytic competency/sophistication—both of which are characterized by applicability (Roulac, 2020)—influences capital availability, functionally making capital more or less available, which in turn acts as a self-fulfilling prophecy in causing good markets to go bad and enabling bad markets to recover.

Consequently, underwriting standards are subject to the cyclical phenomenon, varying in stringency depending upon perceived market conditions, most especially lenders' recent experiences. Thus, property markets cycles lead to cycles of regulatory and standards (Roulac, 2000) These underwriting standards, in turn, influence expectations of appraisal report quality, credibility, and integrity, as well as appraisers delivering value opinions that may be more or less conservative, depending upon market conditions.

Behavioral Factors Loom Large

Notwithstanding the merits and benefits to be realized from directly addressing market cycles and the widespread application implications and prospective consequences in the context of property markets, operationalizing market cycles perspectives is challenged by fundamental behavioral considerations. To this point, Pyhrr, Roulac, and Born concluded their comprehensive study synthesizing commentary on real estate cycles by considering the behavioral factors that challenge the explicit incorporation of investing strategies and practices through market cycles perspectives:

> *While the strategic implications of real estate cycles for investors and portfolio managers are straightforward, implementation of the concept of real estate cycles into investment decisions can be very complex, because of the interdependency of multiple cycle phenomena. Notwithstanding this implementation complexity, three crucial interdependent themes need to be considered by investors and portfolio managers who would incorporate the lessons of real estate cycles into their investing strategies—detachment, persuasion and flexibility.*
>
> *Detachment—Detachment is needed to have the independence of perspective to perceive how real estate cycles influence a specific real estate decision. Because real estate cycles are much more readily recognized on a posteriori rather than a priori basis, inevitably the detachment to recognize real estate cycles parallels contrarian thinking concerning market conditions and future outlooks.*
>
> *Persuasion—Once one has determined the applicability of real estate cycles to justify a particular decision, the next challenge is the persuasion to motivate those who must decide amongst alternative resource allocation opportunities to act. This persuasion challenge can be daunting, since the action sought will often be directly contrary to consensus thinking and what is perceived to be consistent with the collective ideas of the majority of market participants. Those who possess the detachment to perceive the implications of cycles are in the minority, and those who can combine that detachment with the persuasion skills to motivate senior executive and board decisions as well as to attract institutional investors' capital commitments are a still smaller minority.*

> *Flexibility—The real estate investors and portfolio managers who would incorporate real estate cycles insights into their business must be both flexible in how they pursue certain fundamental tasks, such as leasing, and also in the relative priority and emphasis directed to different real estate business activities. Flexibility concerning leasing takes the form of customized leasing rates and terms, tenant selection criteria and duration. The role of flexibility follows from assessment of market conditions. In particular, in markets that are perceived to be moving strongly upwards (recovery or expansion phases), lease terms might be less stringent, leases might be of shorter duration and tenant assessment criteria more relaxed. In softening markets (contraction phase), by contrast lease terms would tend to be more demanding and of longer duration: stronger tenant quality and credit strength would be emphasized.* (Pyhrr et al., 1999, p. 59)

Advancing Market Cycles Insights to Inform Valuation

Calls to constrain financial miscalculation advocate imposing constraints on property markets. Advocating such a thing might be achieved by international financial standards that would provide more consistency, clarity, viability, and transparency in valuation reporting and thereby mitigate the extreme circumstances that can lead to more pronounced superficiality than might be valued (Parker, this volume). Notwithstanding the extraordinary importance of property cycles, the research record of property market cycles intelligence is fragmented, highly technical, and consequently less than broadly accessible (Kauko, this volume).

Calls for appraisers to adjust valuations and so-called real market value could be considered a compromise in credibility in the ways in which fundamental questions are asked (de La Paz & Tárraga, this volume). Among the rewarding insights and teachings of this volume concerning the intersection of valuation and property approval are the challenges over whether a point of a particular evaluation assessment is made at the peak or trough, the up or down stage of a cycle (d'Amato, this volume-a).

The very nature of the application of efficiency-motivated decision rules—known in academic research as a *heuristic*—may in fact lead to decisions that are less than prescient, even sub-optimizing, if not perverse. To this very point, heuristic to rather simplified, easily implementation of analyses, that in fact contribute to cyclicality, as much as a *one-analytic-process-fits-all* mentality can exacerbate valuation miscalculation and lead to outcomes characterized more by an unintended consequence than superior market function (Coskun, this volume).

Economic development, cyclical behavior, and the consequences in real estate markets are interdependent and mutually informing (Sahk, this volume). Though many property practitioners are inclined to specialize, focusing on the narrow parameters of their particular interests, fundamentally the business cycle is important. In continuing the impact of the business cycle, to undertake a property valuation without considering the impact of the business cycle is a problematic proposition (Herath & Maier, this volume).

An important insight concerning valuation context and property cycles is that there is a fundamental imbalance between the knowledge about property markets

and projects between borrowers and lenders (Grover, this volume). Recognizing the disconnect of addressing new problems with old methodology, new analytic methodologies are needed (d'Amato, this volume-b). The inherent backward-looking historic perspective of built in valuation is not well equipped to deal with the inherent cyclicality of a highly involved cyclical environment (d'Amato & Coskun, this volume-a). Variability is inherent in economic affairs, most especially in the property markets. Analytic approaches that recognize this fundamental phenomenon offer more prospects for meaningful and reliable value computations (d'Amato et al., this volume).

Integrating property market cycles and valuation processes through capitalization models that explicitly incorporate cyclical phenomena may offer superior insights to what might otherwise apply (d'Amato, this volume-c). Considering and combining the consequences of valuation processes, transaction prices, and market activity offers superior insights than might be realized were those significant interdependent elements considered in isolation rather than in an integrated framework (Mooya, this volume). Given the inherent complexity underscoring property valuation, more sophisticated mathematical formulations can yield important insights (Michaeltz & Artemenkov, this volume).

The central take-away from this stellar collection of chapters is the confirmation that just as marketing pros promote the imperative of the *message-to-market-match*, so, too, must property analytic techniques appropriately match market conditions—and market cycles forces, specifically—the teaching of which was promulgated four decades ago:

> *Investment analysis and valuation techniques must be compatible with the dynamic market they seek to measure. . .Explicit economic approaches that forecast every relevant item in the investment analysis and employ reasonable real return numbers are preferable to static models that have long dominated the United States markets.* (Roulac, 1982, p. 564)

This volume calls on property scholars, researchers, practitioners, investors, and valuers to be mindful of the implications of market cycles in valuing property interests.

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Acronyms

AVM	Automated Valuation Model
CYC	Cyclical Yield Capitalization
CCA	Cyclical Capitalization Approach
GFC	Global Financial Crisis
GRM	Gross Rent Multiplier
TAPA	Transactional Asset Price Approach

Chapter 1
Introduction



Yener Coskun and Maurizio d'Amato

Abstract This controbution is a general introduction to the book. Some very basic economic concepts are recalled to stimulate the attention of the real estate professional as well as the academic on market impefections. The se imperfections in our view is something we should know, is a challenge to our way to see the reality instead of something to hide. The final part describe the general organization of the book.

Key words Property valuation · Property market cycle · Market imperfections

Although the popular belief among unsophisticated market participants implicitly involves the idea of a high-return asset class, unending economic uncertainties in real estate markets suggest that real estate markets may also tend to lose their short-/long-term visibilities due to apparent cyclical value shocks. Empirical literature has also long been revealed that there is no fully trustable safe heaven asset that may persistently overcome the disruptive effects of the return uncertainties. However, appraisers may overstate/understate the value because they fail to consider the impacts of economic and market cycle variables (see Pyhrr et al., 1996); categorically, real estate values are also very open to volatility shocks. Beside various regional and country-specific uncertainties, we may argue how hard to estimate a long-term fair value of (real estate) assets under the shadows of various globally important catastrophic events observed in the last two decades such as the September 11 attacks in 2001, dot-com bubble (2000–2003), global financial crisis (2007–2010), and currently evolving Covid-19 pandemic lockdown. This situation

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suggests (Costantino et al., 2009; Geltner, 1989; Green, 1997) that the value of real estate (and other asset classes) highly depends on the cycles and uncertainties.

Cyclicality, Asymmetric Information, and Real Estate Appraisal

Cyclical behaviours of property markets have serious value effects specifically on banking, securities, and insurance business beside the (in)direct effects on real estate markets. However, literature reveals firm-/industry-wide risk management practices through (self-)regulation and market discipline have serious limitations to develop timely answers to the risks arising from the cyclical behaviours of the real estate market and general economy. It is also not usual to observe appraisal practices openly utilizing cyclical factors in property sectors. The usual practices generally ignore formal adaptation of cyclicality factors, but instead employ some alternative analyses/datasets at the best for attempting to reflect the cyclical nature of the property markets such as using different cash inflow estimations based on mid-long-term scenario analyses or using different generally arbitrarily selected low/high discount factors. Valuations are carried out on comparable selection or information normally closer to the time of valuation. The fair/objective dataset selection would be specifically important in real estate markets having low market transparency and high asymmetric information problem.

The role of market cycles in the value formation in real estate prices attracts considerable research attention recently. This book presents theoretical and practical discussions to solve the puzzle of integrating cyclicality component into real estate valuation practices with some possibly new contributions. At least the last two decades (Kaklasuskas et al. 2012; Renigier et al. 2019) of the world implies that uncertainty/cyclicality is the integrated part of the economy, real estate researchers, valuers, market professionals, and standard-setters should spend more time and energy to solve the cyclicality-based real estate value in practice. Analyses of real estate market cycles began with the pioneering work of Kuznets (1930) who describes swings as a medium-range economic cycle that is 15–25 years and related to immigrant inflows/outflows and the consequent changes in construction activity. Hoyt (1933) analyses land values in Chicago between 1830 and 1933. Born and Pyhrr (1994) attempt to include property market cycles in a valuation process. Studying the determinants of Canadian commercial property prices, Clayton (1996) suggests that major market cycles may be detectable in advance potentially leading to arbitrage opportunities. Mueller and Laposa (1996) analyse rent distributions in different alternative market cycles. Dokko et al. (1999) built a property cycle model linking property value and net operating income. In their work, 20 office markets showed different cyclical behaviours that may be represented by their 3-parameter econometric specification. It seems that the recent real estate valuation literature more frequently refers to the relation between cyclicality and value, thanks to the frequent cycle-connected value volatilities in property markets. For example,

d'Amato et al. (d'Amato, 2015, 2017a, b; d'Amato et al., 2019a, b) applied a cyclical capitalization approach for the London office market by integrating property valuation and time series analysis. In brief, it is widely accepted in both theoretical and empirical literatures now that the estimated value of income-producing properties is sensitive to market movements. This sensitivity probably becomes more severe in the long term because of the estimation of fundamental and exit values. As broadly discussed in the existing literature and in this book, international standard-setters also recognize the cyclical and volatile nature of the property value estimation (Renigier et al. 2018). As discussed by d'Amato and Coskun (2020) in this book, IVSC, RICS, and TEGOVA set various rules and develop explanations on the role of uncertainty in real estate valuation. However, these globally accepted valuation standards have no methodological emphasis on the linkage between cyclicality and the value. Therefore, rule-making gap is clear in the nexus, and there is no clear answer to the relevant questions such as how cyclical nature of the property markets and general economy affect the value of a property or how property value may reflect the impacts of cyclicality. This is arguably a big concern for the reliability of the global property valuation standards and also value estimations in the related financial and real estate sectors. The attempt to integrate real estate market cycles with property valuation is not a new concept. In his work on determining the overall capitalization rate, Kazdin (1944) addresses the importance of including business cycles in calculating the capitalization rate. However, the first attempt to include property market cycles in an analysis was the work of Bow et al. (1994). Their work laid the fundamentals for examining the relationship between property market cycles and valuation. Dokko et al. (1999) further attempt to build "... a theory of real estate cycles that demonstrates the interrelationships among the economic cycle, real estate rental rates and property value cycles over time". Income-producing properties are normally appraised using methodologies which estimates "...an indication of value by converting future cash flow to a single current value. Under the income approach the value of an asset is determined by reference to the value of income, cash flow or cost savings generated by the asset..." (IVS 2020, IVS General Approaches and Method, para 40.1). In the appraisal process of an income-producing property, valuers often define a set of market condition and economic trends that are assumed to remain stable into the future. Cash flow calculation is based on similar assumptions. For this reason, many appraisals overstate or understate the value because they fail to consider the impacts of economic and market cycle variables (Pyhrr et al., 1996). After the global financial crisis, the role of the market cycle has become more important both in theoretical/empirical literature and in professional world. In fact, the myth of an ever-increasing real estate market is something more than an implicit assumption; it is a "latent way of thinking" behind the appraisal report based on the income approach methods that become pro-cyclical (DeLisle & Grissom, 2011). In fact, Roulac et al. (1996, 1999) provided a qualitative study on important cyclical relationships and conclude that real estate markets are influenced by the general economy, demand, construction, property values, volume of transactions, investment for real estate, investor sentiment, and tax climate factors. Furthermore, price/return volatility has long become

one of the main features of real estate portfolio management, thanks to the cyclical nature of the real estate assets. This derived behaviour connected to the underlying economic cycles. Declining visibility during up/down market conditions generally makes difficult to estimate the value in real estate appraisal and hence may result in appraisal biases and value-connected risks in various industries. A further issue is how information is organized and managed by valuer and advisors. The cyclicality of real estate market is amplified by the imperfect nature of the information. Consequently, the valuation is subjected to different biases that may have different dimensions. In literature, cognitive and appraisal bias, as a systematic deviation in judgments, has been analysed in several aspects related to valuation problems (Yiu et al., 2006). The valuation process is tight between a heroic hypothesis like a forecast of an ever-growing or stable rent and an information that is sometimes asymmetric and affected by cognitive bias. For this reason, the best way to deal with information asymmetries in the value estimation is to improve the quantitative information quality of the property appraisals. As suggested by Born and Pyhrr (1994), appraisers should develop cash flow models that explicitly incorporate cycle impacts in order to produce realistic present value estimates and valuation conclusions. However, it is observable that existing real estate valuation models/practices have long suffered from the lack of sufficient emphasis of a cyclicality component. Therefore, in the chapters of the book, this may result in a gap between market and estimated appraisal values. The use of high-end modelling approaches with a long-term data structure may help to develop a better value estimation. Moreover, AVM applications are moving towards spatio-temporal modelling; we think it is the time to increase the role of time series even in the valuation in persons. This opportunity may open the daily work of a valuer to an integration between the comparable collected and the valuation trends. Unfortunately, the attempt to develop a healthy link between property market analysis and property valuation seems a forthcoming goal. This book tries to propose several possible solutions trying to explore also the reason why there is a distance between property market cycle and property valuation.

The Content of the Book

This book is dedicated to contribute on the academic and professional debate on how to address the role of property market cycle in the valuation and counselling activities. It is collocated in a grey zone between the academic debate and the everyday task of appraisers especially involved in the valuation of income-producing properties. We explored issues in the intersection of property cycles, real estate value, and property valuation standards with the aim of highlighting problems currently considered real estate valuation literature. Particularly, this book seeks of answers to the following questions: How does the cyclical nature of the property market create appraisal bias? How does property market cycle affect real estate market analysis and property market rating? How to identify property cycles with and address cyclicality through valuation standards? Do regulatory

responses help to minimize property cycles and value uncertainties? How to fill the gap between property valuation and property market cycle? In this domain do traditional income approach methodologies can modify? Does hedonic approach help to solve housing valuation problems in a cyclical environment? Although some of these questions are not new, it seems that the existing literature is still struggling to find satisfactory answers. The book is divided into two different parts. The former part is related to the analysis of property market cycle at the theoretical level and their influence on the real estate market. The latter part of the book discusses various aspects of business cycle and its impacts on value, the regulatory role, and some methodological solutions that may be helpful to take into account the role of the market cycle in the valuation process. Each part is briefly introduced by few words that explain the detail of the content of the part.

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Part I
Inside Property Market Cycle

Chapter 2
Property Market Cycle



Maurizio d'Amato and Esra Alp Coskun

Abstract The present chapter is an introduction to the first part of the book dealing with the problem of porperty market cycle at theorical level. It seems that property market cycle as an indirect violation of market perfection. This is the reason why in this book we try to create a relationship between property market cycle analysis and professional valuations. This part is a necessary premise to such kind of integration. In this introduction the general organization of the contributions of the first part is provided.

Key words Property market cycle · Property market · Market perfection

The basic idea of cycles appears in the book of Genesis, Chapter 41, describing the Pharaoh's dream of the seven fat cows and the seven lean cows, which Joseph rightly interprets as seven good years followed by seven bad years (Pollock, 2015). Pioneering works in this field were proposed by Hoyt (1933) for the US and Cairncross (1934) for the UK market. As a result of their investigation, property/building cycles were considered as a local phenomenon, normally independent from the economy. More and more property market cycle analysis has been considered strategic, and important remarks have been raised on the consequence of inaccurate time series data. The growth in the power of calculation in this field has been considered a strategic tool to prevent future bubbles (Barras, 1994; McGough & Tsolacos, 1995). Although the important role in our economy, the debate is mainly focused on the causes and the nature of the property market cycle often separated from valuation practice. This part addresses the importance and the role of the

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property market cycle both in the professional standards and in literature in order to propose possible technical solution in the valuation professional activity.

There have been few attempts to include property market cycle in the valuation process. The most important contributions in academic and professional literature in this directions have been published by Kazdin (1944) invoking a real estate market cycle analysis whilst determining the overall capitalization rate and more extensively Born and Pyhrr (1994) focusing on the relationship between direct capitalization and property market cycle whilst observing the weakness of a constant overall capitalization rate. Recently, the information about real estate market are increasing more and more, and valuer may deal with property market cycle in a different way. Time series on price, rent and cap rate are available for the valuer purposes. Recently approved European Valuation Standards 2020 provides indication on the property market cycle in the definition of holding period assuming "...sufficiently long to allow for all leases to expire and for subsequent renewals or re-lettings....This could reflect several market cycles within the holding period..." (European Valuation Standards, 2020. para 7.31 Part II, Valuation Methodology). This is particularly relevant if we consider the growing synchronicity among different housing markets (Mack et al., 2011; Miles, 2017) mainly caused by traditional fundamentals affecting demand and supply for housing and capital flows together with property investment and immigration policy (Duca, 2020). Regularity in the property market cycle has been detected also in the commercial market (Scott & Judge, 2000). Therefore, the valuer may be asked to take and include these regular cycles in the valuation process (Constantino et al,. 2009; Renigier et al., 2019).

This part provides the theoretical evidence of the important role of the property market cycle in the valuation process and more generally in the real estate market (Renigier et al, 2018; TeGOVA, 2020). In the first contribution, Kauko exposes a literature review on the role of the property market cycles and their linkage to economic cycle. It is important to highlight that in the conclusion, he stresses the need of a more detailed analysis in the field of the property market cycle according to the literature Grover and Grover (2013, 2014). Finally, he proposes the use of a valuation methodology forward looking or in alternative a methodology based on subjective risk. In the following chapter, Parker exposes a complete review on the role of the property market cycle and the valuation process. He addresses the problem of a valuation challenged by the infrequency of trading asset and the consequent valuation lag in the direct property market. This is a problem that a valuer should face in dealing with the valuation process. For this reason, a coordinated action on valuation frequency at international level may represent an efficient answer. Starting from the recent definition of cyclical asset included in the IVS 2017 and IVS 2020, d'Amato and Renigier provide an analysis on how property market cycle affects the input of a valuation according to US and UK income approaches facing the real estate market crisis (Kaklauskas et al., 2013). Taltavull de la Paz and Juarez Tarraga underline the importance of the role of property market cycle and their role on the valuation process. In the final chapter, Siniak and Maurizio d'Amato propose the theoretical background of the cyclical capitalization models and their relationship with property market cycle.

Real estate market bubbles and generally speaking property market cycles may play an increasing role in the valuation process. The third part provides an academic and professional introduction to the cyclical valuation problem raised by this book. This will help the reader to understand better the importance of recent methodological improvements in the valuation process.

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Chapter 3
On the Essence of Property Cycles



Tom Kauko

Abstract Property cycles are of two kinds: one is the physical cycle of demand for and supply of property (i.e. real estate; land and buildings with right to build, including renewal areas); the other is the financial cycle that triggers investment and development activity. To a varying extent, these phenomena are considered global with international repercussions, and with increased economic and financial globalisation, the cyclic element in property markets has increased too. However, despite the massive economic significance of property cycles, it appears as if the body of knowledge surrounding and underpinning the academic debates that also inform practice has been relatively fragmented so far. Today, at the dawn of big data, this might indicate ignorance or disagreement about specific methods of analysis rather than lack of access to statistical time-series records. At any rate, much of this literature tends to be highly technical and therefore not completely accessible for every observer, even on the academic side of research programmes. Because of this shortcoming, this chapter comprises a summarising and non-technical account on the topic. Additionally, the discussion is framed in a valuation-cyclicality context.

Keywords Asset · Cyclicality · Economic globalisation · Financial globalisation · Methodology · Property cycles · Research methods · Valuation

Introduction

A cycle is commonly defined as 'a series of events that are regularly repeated', and a business or property cycle defined as when '... sinusoidal waves pass through a series of peaks and troughs, where the economic activity moves from boom phase to bust and back to boom repeatedly' (Grover & Grover, 2013, p. 503). To cite RICS (2015), '[a] property cycle is a logical sequence of recurrent events reflected in factors such as fluctuating prices, vacancies, rentals and demand in the property market'. Property cycles are of two kinds: one is the physical cycle of demand for

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and supply of property; the other is the financial cycle that triggers investment and development activity. To a varying extent, these phenomena are considered global with international repercussions, and with increased economic and financial globalisation, the cyclic element in property markets has increased too. The type of cycle is dependent on four 'key economic principles: depression, recovery, boom and recession (also frequently referred to as boom, downturn, upturn and stabilisation)'. The durations vary between 4 and 12 years, although some analysts refer to even 18-year property cycles. The chapter reflects on the essence of property market cycle giving the tools for a comprehensive introduction. The epistemology is interesting here: the essence of a property cycle is in its switch between any of the above-mentioned four distinct stages. Thus, the ontology here is arguably less interesting: the 'being' is one and the same for us, as we cannot see any direct differences between each of these stages. In short, we cannot know anything about the cycle first-hand. From this follows that what we believe to 'be' in the case of the cycle really is irrelevant here – as is what we see as a consequence of the cycle – because we cannot experience first-hand that either. Thus, identification of the four stages, using second-hand evidence, is the key to successful tackling of the topic.

On the other hand, an agreed-upon general research tradition based on this epistemology has not yet been forthcoming. Despite the massive economic significance of property cycles, it appears as if the body of knowledge surrounding and underpinning the academic debates that also inform practice has been relatively fragmented so far. Today, at the dawn of big data, this might indicate ignorance or disagreement about specific methods of analysis rather than lack of access to statistical time-series records. At any rate, much of this literature tends to be highly technical and therefore not completely accessible for those of us who prefer to keep track of the whole picture. Because of this shortcoming, this chapter comprises a summarising and non-technical account on the topic. Additionally, the discussion is framed in a valuation-cyclicality context.

A variety of approaches to analyse property cycles exist to date, as each of them focuses on a particular theme; a comprehensive review of these is provided by Jadevicius et al. (2010). To contextualise the present selection, the approach by Grover and Grover (2013, 2014a, b) is considered particularly helpful here: this approach recognises the strong historical evidence in favour of the view that we cannot avoid cycles but only moderate them, perhaps. It needs to be born in mind however that not everyone agrees with this assumption – or world-view.

Grover and Grover (2013, 2014a) do look into the identification of property cycles, in general, and also with the residential/housing sector, in particular (2014b), and arrive at a logical and coherent storyline that touches on a wide range of particular issues. In the present chapter, the main point is not to regurgitate all the same information, but to develop some of these issues a bit further: first of all, if property prices and rents grow too fast and too much compared to the corresponding pace and magnitudes of economic fundamentals (i.e. incomes and consumer prices), and also without a simultaneous upgrading of the amenities and infrastructure of the surrounding built environment, we might have evidence to speak about a bubble developing; second, we need to look at what appraisers and valuers could do to solve this problem, or at least to moderate it, both within their

own core activity and when assisting economic policymakers at various tiers of government ranging from the local and regional to national and supra-national.

Property Cycles - Economic Cycles

In lay terms, markets fluctuate as a result of all sorts of external factors that cause uncertainty about the future, and political changes are part and parcel of this (see, e.g. French, 2017). Cyclic movement then means some kind of regularity of extreme fluctuations of market indicators. These regular fluctuations, cycles, might be related to either macroeconomic or financial movements, or they are local endogenous real estate phenomena.

Since the 2007–2008 global financial crisis, plenty of discussions have focused on the interrelationship between general economic and property cycles. This is not to say that such discussions did not take place earlier; in fact, research on cycles was already carried out in the nineteenth century,[1] but it is the sheer devastation caused by this particular crisis that has led to new more analytic comments on the matter. While it is widely agreed that cycles are unfavourable for economy and society at large, some uncertainty still exists as to what their exact definition and context are, as well as to how to identify and perhaps control them (see Grover & Grover, 2014a, b). The broader market fluctuations are different across sectors of the economy, and as these sectors become interlinked via the banking system, booms and busts in one industry are transmitted to other industries via multiplier effects. The remainder of this chapter will revisit this set of topics and offer some guidance for those who are more focused on the real estate side of phenomena, rather than general business considerations. A more thorough examination of these issues and their relationship is provided by Grover and Grover (2013), who manage to convince us about the need to separate between two forces at play: one, external economic shocks that, because of weak adjustments, lead to oscillations in various indicators including property market indicators (i.e. waves), and two, endogenous property cycles possibly caused by the development of technology, when each cycle tends to create similar vintage buildings that then are likely to ratchet up the economy (i.e. actual property cycles) and in this way define an epoch in real estate economic terms.

So a relative consensus exists about the detrimental impact of property cycles on other areas of economy and society at large. Indeed, large market upswings and downswings seem to invite risk takers to such gambling that in other times would fall far outside what is considered 'rational behaviour' or 'rational expectations' (cf. Grover & Grover, 2013, 2014a). It is therefore unsurprising that, speculative

[1] Grover and Grover (2013, p. 508) pose an interesting question as to why the industry has not learnt anything from the similarity of Hoyt's study of Chicago between 1830 and 1933 to more recent analyses of property cycles. But we cannot really answer this question in other ways than to admit that it is in the human nature.

investors notwithstanding, market stability tends to be the preferred state of affairs for strategic financial decisions in all areas of business. Regrettably, whenever huge booms occur, the pattern is invariantly that speculators just fuel this until the market development no longer can sustain itself, like the Ponzi scheme, and eventually bursts. After boom comes bust.[2]

Here, it is to note that the exact conversion points cannot be forecasted accurately although this challenge is worth taking on, as shown by Tsolacos (2012) below. This difficulty is the result of complexity, because the economic movements upwards and downwards follow not only the historical trend but also how related factors change: the more cash in pocket, or more credit available, the more one can spend on property. Property price movements then follow, with a lag and, in the same direction, movements in income and GDP, and inversely corresponding movements in interest rate indicators and existing stock (e.g. Grover & Grover, 2014a, Kajuth et al., 2016; Berki & Szendrei, 2017); related factors such as unemployment (as an approximation of income) are occasionally included in the list of input variables too (see Drachal, 2016).

When tracing the movements, the analytically treatment needs to separate between the macro- and micro-level elements of the property cycle. The former is about the macroeconomic and financial fluctuations – also often cyclic by nature. The latter, in turn, is something endogenous to the local property or housing market itself and related to the determination of capitalisation rate and market value. So, of these two influences, only the micro element can then be an appraiser problem. However, but also in this case, the existence of a local market cycle poses additional challenges for the analysis. What is the frequency of the peaks and lows? And what are the amplitudes of these?

While bubbles may not be as frequent as media says, and property cycles are not the same as general business economic cycles, the same kind of mechanisms applies in these two phenomena. Much following the rationality and behaviour of stock markets, the received wisdom is much about price development that exceeds fundamentals in all cases of cyclic behaviour. However, in some cases, the explanation based on rational expectations might hold better (cf. Clayton, 1996; Kim & Kim, 1999). It is anyway difficult to observe the development of a bubble and, by implication, to subsequently verify a cycle. Therefore, it is also difficult to predict when one is emerging. Moving to property cycles, the inelasticities of supply and absence of short selling pose extra challenges in relation to understanding general economic cycles. We also must note that buyers have different views about the relevant fundamentals (Grover & Grover, 2014a).

[2] As I am putting the final touches onto this chapter, the corona crisis is in full swing in Europe, North America and much of the rest of the world. The short- to mid-term forecast is that the magnitude of this cataclysmic state of affairs is going to exceed all the wildest fears of what an extreme 'bust' could be. Some of the most globalised industries (including a substantial chunk of the commercial real estate sector) will experience devastating consequences. Eventually, a less globalised state of business and life is bound to emerge from the ashes. Strict border control and return of manufacturing could become the new reality.

The Duration of the Cycle

Because of the centrality of real estate for the occurrence of the latest financial crisis, a general importance of real estate for the economy is even recognised by UN (2010). The amplitudes of the fluctuations and the adjustment times are however less clear-cut phenomena and express strong variation depending on which indicator we track. For example, sales volumes tend to fluctuate more than price levels, which was what Berki and Szendrei (2017) confirmed using error correction models and national housing data of Hungary for 2001–2016. In a more theoretical sense, we can find lots of literature on economic cycles to base our definitions and characterisations on. For diagnostic purposes, we can use Kondratieff's long cycles (Fig. 3.1) and also shorter cycles (i.e. Kuznets cycles of 15–25 years; major cycles of 7–11 year's duration related to investment cycle; minor ones of 3–5 year's duration related to inventory cycle) with various degree of synchronisation between them, as Grover and Grover (2013) show (cf. Girouard et al., 2006). To isolate them from all the data noise, and amalgamate the different types of cycles, requires sophisticated statistical time-series methods or, preferably, mathematical techniques of spectral analysis; the main problem here has to do with the length of time-series needed to decompose the overlapping cycles of different durations (see Grover and Grover, pp. 511–513; cf. Birch & Sunderman, 2003; Chin & Fan, 2005; Wheaton, 2005). The problem of data limitations is furthermore different in different countries (cf. Grover & Grover, 2014b, Kajuth et al., 2016; Drachal, 2016).

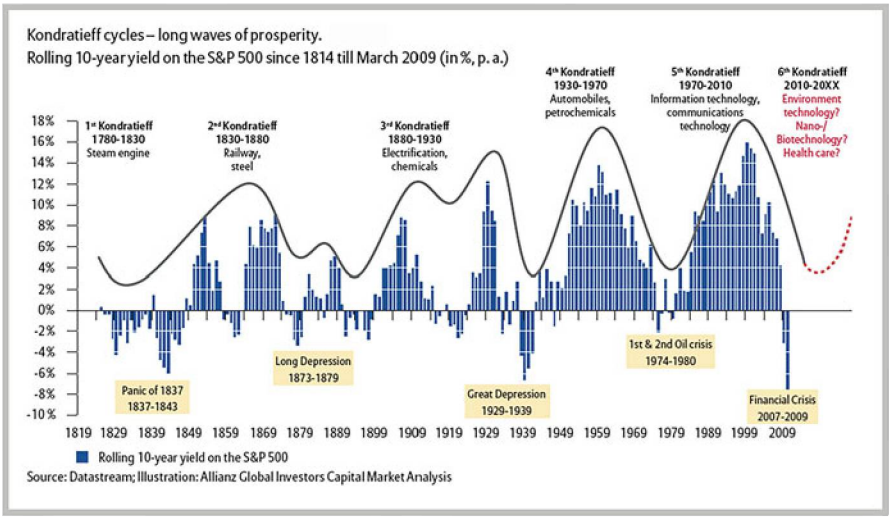


Fig. 3.1 Kondratieff's study of price trends

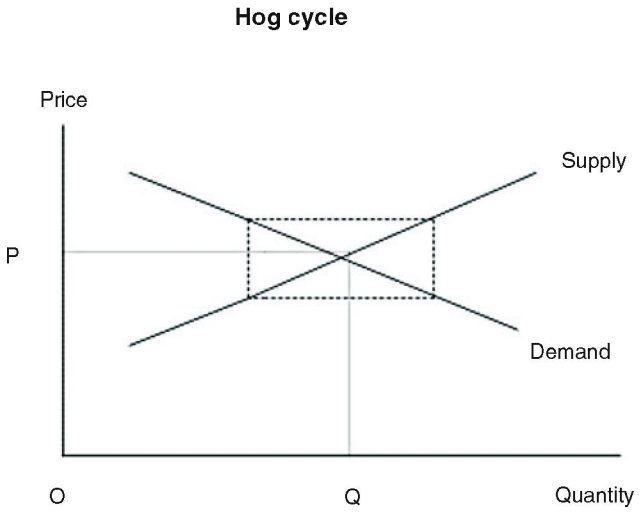


Fig. 3.2 The Hog cycle

Particularly within the property market context, the slowness of the production process is one of the key influences on cyclicity. We refer to the Hog cycle (Fig. 3.2): a simplistic model about how locally driven alternating increases and decreases in price and quantity result in a movement of supply and demand, where the price and quantity all the time approach equilibrium as a result of error correction of buyers and sellers; in this case, the supply and demand are in constant imbalance, mainly due to the long production times. One of the most common manifestations of this is when house prices overshoot because of supply constraints (e.g. Berki & Szendrei, 2017). These models of cycles demonstrate the basic principles of cyclicity, but are much based on ideal representations.

On the evidence side, we can examine various recessions: The Great Depression of the 1930s, the oil crisis 1973–1975, the South East Asian banking crisis 1997–1998, the dot-com crisis 2000–2001 and, most recently, the global economic and financial crisis stemming from the US credit crunch and subprime mortgage crisis 2007–2008 (some call this the new Great Depression), with its (in many cases) still ongoing repercussions across national economies in Europe (aka the European sovereign debt crisis). But are these cyclic patterns specifically property oriented? Apart from the last one, which by definition was tied to property values, this is an ambiguous issue (cf. Grover & Grover, 2013).

In this vein, it is relevant to examine the root cause of the cycles: is it real estate itself (i.e. micro effect), or is it financial and macroeconomic movements? In some cases, the reality might be in between these two explanations.

When we look at the commercial property price development across Western countries, in Germany, the trend is completely different than what the trend is in other countries (Fig. 3.3). This is because this country was detached from the global financial boom and bust cycle until after 2010. This observation about Germany

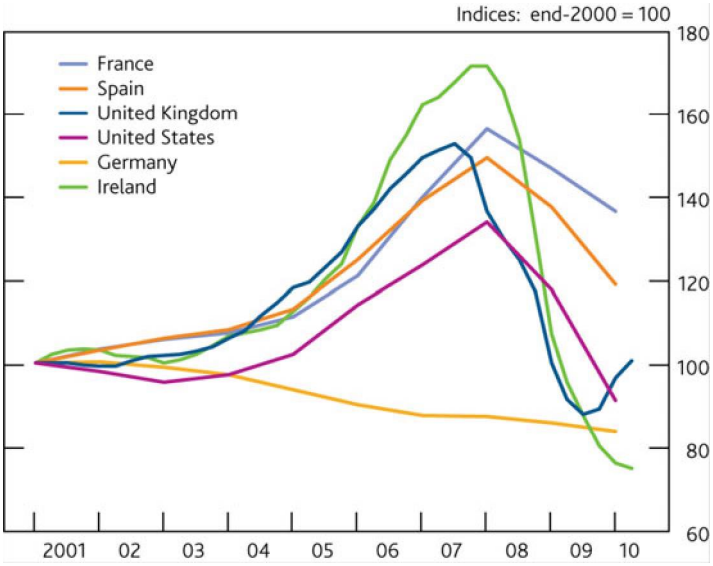


Fig. 3.3 International commercial property prices. (Source: Bank of England Financial Stability Report June 2010)

being an anomaly in the sense that the global financial crisis did not hit this country so hard is also confirmed from house price time-series (see Kajuth et al., 2016). The reasons are at least of two more kinds: one, banks are predominantly local or national, and two, buying property is traditionally not common among occupiers and, as a consequence, also not interesting for investors. This proves that the local circumstances might matter more than global networks in a sufficiently large and self-contained economy. Subsequently, Kim and Lim (2018) concluded that, while Germany may not have experienced a housing bubble yet, one is likely to occur in the near future.

Kim and Chung (2015) conclude that house price changes in the UK have impacted the business cycle and the switching of the economy between expansion and recession stages. In contrast to the closely knitted ties between the banking sector and the industry found in isolated Germany, the corresponding situation in this country is strongly based in global macroeconomic market performance.

According to Francke (2010), in the Netherlands, the housing market trajectory up to the financial crisis 2007–2008 coincides with the global and US-based trajectories. The real interesting finding here is however that the trend is caused by specifically Dutch housing policy circumstances such as favourable mortgage policy and taxation, rather than just being expressions of impact waves from over the Atlantic. So also the national situation matters here.

Given the acceptance of various influences on stable market trends, what then constitutes a property crisis? At least what was experienced in Finland and Sweden

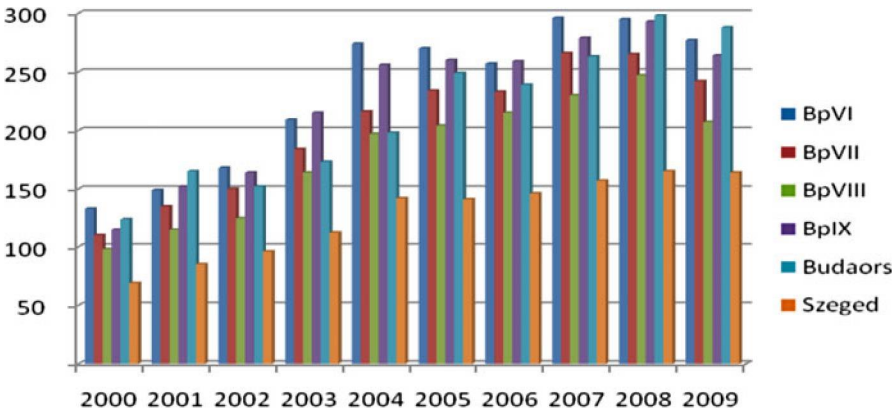


Fig. 3.4 Price development in selected Hungarian municipalities (mean price per sqm.). (Source: Own calculations; data provided by Hungarian National Statistical Office (KSH))

in the late 1980s can be characterised as true property boom and bust sequence. Here, the problem was that, using a standard income approach with assumptions of constantly growing rents,[3] banks overestimated the property value when, in reality, it was about to decline. In Finland, even swampland in the northern regions had a value completely out of touch with reality in terms of realistic land use. Due to a new situation where the old extremely regulated market context had changed to a deregulated economy during the mid-1980s, the bank managers were not prepared for what happened next.[4] Namely, in the increasing price climate (around 1986–1989), the values were drastically overestimated. In the beginning, this happened only with, say, a multiplier of three, and then later, when the boom turned into serious bust (around 1990–1993), the supposedly three times overvalued property in reality had only one third of its original value. (So this caused a ninefold error in valuation magnitude.) However, banks had already issued loans marked at the threefold value, so when the banks got repossession of this overvalued stock, the banks lost their capital and liquidity, and consequently, the managers, without exceptions, lost their jobs. Eventually, the market recovered, but we can in this case talk about an almost decade-long economic and property cycle.

In the same vein, we can also look at the case of Hungarian housing market 2000–2006. Here, housing mortgage subsidies were introduced in 1999, but then in 2003 abolished. The effect was a sudden increased demand (thus, with 1-year lag after the elections, so 2000 and 2004, respectively, see, e.g. Kauko, 2013, p. 18), as a result of buyers having more to spend, and then a corresponding decrease, when the next government withdrew them. Figure 3.4 shows this price development broken down for various local circumstances (i.e. four municipalities in inner Budapest; a

[3] A wrong assumption, as shown by d'Amato et al. (2015, 2017a, b, 2019).

[4] Smith et al. (2006) call this kind of overheated market place 'casino', where buyers throw money and agents become ignorant.

suburban municipality in the Budapest region; a large provincial town). The trend is clear here: steady increase throughout the early 2000s, followed by stagnation and first signs of downfall towards the end of the decade. This is furthermore consistent with the national price trend in this country (see Berki & Szendrei, 2017).

So, whereas Germany is closer to the micro-level cyclicity, in the UK, the cyclicity is more caused by the macro-level. The Netherlands, Finland and Hungary seem in between cases in this respect – with national-level regime changes being at the core of the cyclicity.

The Art of Forecasting and the Benefits Thereof

Making sense of the different elements of cyclicity and forecasting them require specific methodology of analysis (e.g. Grover & Grover, 2013). To be fair, lots of attention have been devoted to study how exact magnitudes of economic indicator values change in the real estate sector. However, the results here are not too successful due to the problem of sparse data dominated by large portfolios as Grover and Grover (2013, p. 513) point out. Indeed, to forecast *turning points* in real estate market, time-series data is so far an under-researched topic. However, as economic sentiment indicators are used for predicting GDP growth turning points, Tsolacos (2012) set out to analyse and predict turning points in office rental growth using this alternative methodology. His probit modelling approach obtained satisfactory predictions of both upturns and downturns in rent growth in London City, La Defense (Paris) and Frankfurt. This is without doubt an important finding as directional forecasts have been neglected at the expense of structural or reduced form models of predicted fluctuations.

Another kind of theme with relevance for real economic predictions is proposed by Hott (2012): the influence of *herding behaviour* on house prices. This is when investor sentiment perceived by groups affects individual investment decisions beyond what is considered economic rationality. In other words, an increasing number of people start to believe that investment in property is a good decision, which subsequently increases price levels more than what price fundamentals would justify. The key point here is that, due to phases of under- and overvaluations in the housing markets, house prices fluctuate more than their fundamental values (i.e. value determined by present and future aggregated income, population and mortgage rates and by past, present and future construction activities, p. 181), and therefore, the widespread opinion that house is a safe asset does not actually hold. However, herding offers here only a partial explanation for the fluctuations; lots of fluctuations and even bubbles that build and burst are likely to occur anyway, due to various reasons with either micro or macro origin, as already discussed (cf. Kajuth et al., 2016; Berki & Szendrei, 2017).

The study of *linkages* between different asset markets, both domestically and internationally, represents yet one more important research direction in this genre. Liow (2016) examines linkages between business cycles, stock market cycles and

real estate market cycles across G7 countries and 24 years. The results suggest that fairly strong linkages between markets can be identified, when business, stock market and real estate market cycles are analysed using spillover index methodology. This finding is important for future research on the linkages of the real economy and the financial sectors. Moreover, the practical implications of this research concern portfolio diversification strategies for different time horizons.

As a follow-up to this study, Liow and Schindler (2017) extended the topic to volatility spillovers across European office markets. The practical question of diversification benefits for investors was now brought to the fore as office property and stocks are two important asset components for many European investors. These authors used time-series data for 16 major European office markets and an error correction mechanism modelling approach together with the same spillover index methodology as in the prior study. Four kinds of lessons were learnt here: (1) increasing integration of office markets tends to decrease the diversification opportunities; (2) London transmits the volatility to other European markets; (3) linkages between yields and capital growth are stronger than linkages across rental markets, as the latter are essentially driven by domestic demand and supply; and (4) asset market volatility cycles and business cycles are evidently interrelated. (The issue of global connections in this context is examined further below.) Elsewhere, Grover and Grover (2014b) find house prices interlinked within three groups of European countries depending on their price developments leading up to the year 2008: (1) a fast lane, Spain, Belgium, Ireland, the UK, the Netherlands and France; (2) average performers, Scandinavia, Italy and Greece; and (3) the slow movers, Germany, Austria, Switzerland and Portugal. These authors also conclude that house price trends diverged considerably before and after the bubble.

So turning points, behavioural aspects and linkages represent some of the topics at the core of the problem of forecasting market developments for various asset classes. As for the public economic and implications of volatility and how it can be predicted, the issue is about how to avoid over- and undershooting of economic indicators. In other words, prepare for downturns while keeping the upwards sloping trends in reasonable control. Because of the substantial role of the US housing bubble in the credit crunch, we can speculate if the global financial crisis could have been moderated, or even avoided, if prudent property valuations had been made at the time of issuing bank loans and if governments and other institutions were concerned about raising the quality of property information. These questions require counterfactual logic to answer, and that is something where the issue of institutions becomes relevant.

Institutional Aspects Therein

When we take a more of a bird's-eye view of the phenomena above, the focus shifts to general tendencies and broad movements. Institutional effects do have the tendency to cause external shocks, and as Grover and Grover (2013, p. 506) point out, a wider business cycle might be reflected in cyclical patterns in the property market.

According to Grover and Grover (2013, p. 507), the cyclicity '... could be damped down by various institutional factors'. At a closer examination, we realise that both micro- and macro-level factors influence the markets. This causes turbulence, which will be for better or for worse for a given market, depending on its starting conditions. Particularly in Central and Eastern European countries, these concerns about financial stability implications of developments in the market are serious, when price dynamics become disconnected from developments in underlying fundamentals of demand and supply (Égert & Mihaljek, 2008). In these circumstances, the problems are particularly serious considering interest rate fluctuations, demographic and labour market movements and establishments of new market and financial institutions.

What is puzzling here is that a country could, in principle, contain financial bubbles by informed policy changes (cf. Baker, 2008; Sapir, 2008; UN, 2010). Namely, sufficient detachment from the global financial system can dampen the effects of crises, as a country becomes less affected by the credit crunch. So, at first sight, the logical preference here should be for a nationally and locally regulated economy as opposed to a liberal globalised economy.[5] However, empirical research has reached completely different conclusions: actually, the less the real estate economy is regulated, the lesser the up- and downswings become, and the easier it is for the market to converge towards a point where markets remain stable (Horváth & Révész, 2014).[6]

At any rate, when we move towards a more mature market context, which is also what most market players want, the need for drastic policy or legal measures decreases. Thus, this path is about trial and error with big regulative corrections being necessary in the beginning of this search, when the environment is immature and much burdened by the past mistakes, and later smaller adjustments, when a path towards a more mature context is found. This importance of setting the apt institutions for the market is a basic argument and supported by various data (see, e.g. Chin & Dent, 2005; Bochniarz & Cohen, 2006; Horváth & Révész, 2014).

Lastly, the land use and planning apparatus is to be seen as one very important type of institution in this discussion, as it impacts property development activity (see, e.g. Kauko, 2003). Especially, in England, it is claimed that planning restrictions constrain the supply of building land and new development and thereby contribute to steep and permanent price increases (Bramley, 2013). Furthermore, property development is cyclic activity, as it follows prices and the circumstances of demand *vs.* supply. Grant (2009) suggests that, while planners think that they can in the long run influence consumer preferences, the market reality will eventually resist it. So it can be argued with good reason that the role of macroeconomic up- and

[5] Obviously, even the most liberal economies require some fundamental economic regulations. It is to note that this discussion concerns the regulation of credit markets and is not to be confused with another debate on the regulation of the planning system and land use (more on that further below).

[6] This view may still be an alternative view, in so far as regulation still is prescribed by many real estate economists as policy solution.

downturns is paramount for the relationship between planning and property development. (The role of valuation in this context is also worth a closer look, further below.)

Real Estate: Partly Local and Partly Global Territory

At the end of our discussion on cyclic behaviour, a small reflection on the scales involved might be in place. Since the end of the 1980s, property markets have become an increasingly global phenomenon, as economic globalisation also means exposure to macroeconomic factors that, thanks to financial institutions such as the World Bank, are similar in different parts of the world. As a consequence, the transmission mechanisms by which property cycles are transmitted from major economies to minor ones have increased (see Grover & Grover, 2013). However, this whole picture is in fact more complicated than mere globalisation.

While many argue for real estate being increasingly international activity, much of this industry is still seen as local (by definition tied to specific micro-location and the spatial extent of externalities matters), regional (consider, e.g. where construction companies and estate agents operate) and national (consider, e.g. state-level housing/planning policies), even if increasingly tied to global economy and issues such as EU or UN sustainability directives.

In general, national markets vary in terms of how their demand and supply side actors are organised. It much depends on the size of the given real estate market; if there is enough domestic demand for and supply of real estate stocks (if physical aspect is the criterion) and assets (if the financial aspect is the criterion), the need to attract international interest in this market is not that great, and then a global approach is not essential. So in a bigger and established market, one could argue that real estate is less global/international than in a smaller and evolving market. So, for example, and leaving aside London prime property submarkets, in the UK, real estate is more local, regional and national than in most other European countries. However, even when looking at larger European countries, perhaps the regional level is the best way to approach the issue of price development, as Kajuth et al. (2016) show for house prices in Germany – using all 402 administrative districts in the country and a period of 11 years. Findings by Drachal (2016) suggest the same, when correlating unemployment with house prices across 17 city regions in Poland.

On the other hand, local and global scales need not to be contradictions; in a global city such as London, the prime office, retail and residential markets depend on rather international investment and at the same time have very specific geographical locations. The overall point to emphasise here is that capital (investment) is far more mobile than labour (people).

One of the assumptions underlying this conceptualisation is that valuation is well-placed to counter harmful impacts of cyclic market behaviour. Value (either actual transaction or estimate of market value) is by definition local, and one could also say that valuation is predominantly local activity (exceptions include the determination

of discount rate, portfolios and perhaps taxation). To a great extent, the value depends on the particular attributes of the micro-location, broader area and externalities of nearby land uses. It also connects with cycles, and here the previous value trajectory obviously matters too.

Valuation and Value

The overall topic of this volume is cycles and valuation. It is therefore in order to relate property value to its underlying value fundamentals, given cyclic market environments. This would reveal disparities between observed values and their fundamental basis and, by implication, affordability problems. When this state of affairs is recognised, possibilities to correct a trend arise. One such possibility would be to smooth the extreme peaks and lows by applying plus or minus adjustments to the observed magnitudes. Where these adjustments would be retrieved from is then partly a technical and partly a strategic (and even political) question; these figures or ratios could, for example, be derived by relating price developments to other indicators such as income level (Fig. 3.5) and consumer index. At the local level, also quality levels of buildings and their locations could serve as such an indicator (Fig. 3.6). The direction of the adjustment for any given year would be proportional to the shown magnitudes, but in the opposite direction. From a normative perspective, the question is about the possibilities opened up by responsible valuations.

So, if valuation and market analysis were integrated into institutional design, economic policymaking in particular, some of the casual mechanisms that cause fluctuations might and would be easier to handle. In an overheated market situation, price increases lead to further price increases due to the inbuilt bias of the system. As Grover and Grover (2014a, p. 220) note, in such a situation, 'there are no moderating countervailing influences' by pessimists who remain outbid by optimists. The

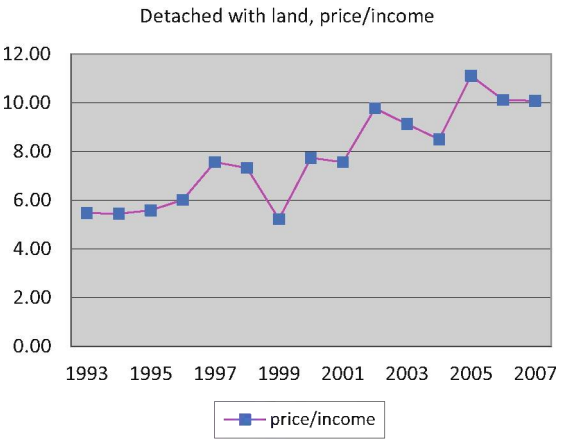


Fig. 3.5 House price development related to income level in Trondheim (for specific segment), Norway. (Source: Own calculations; data provided by the property registry information centre of Norway (Norsk Eiendomsinformasjon AS))

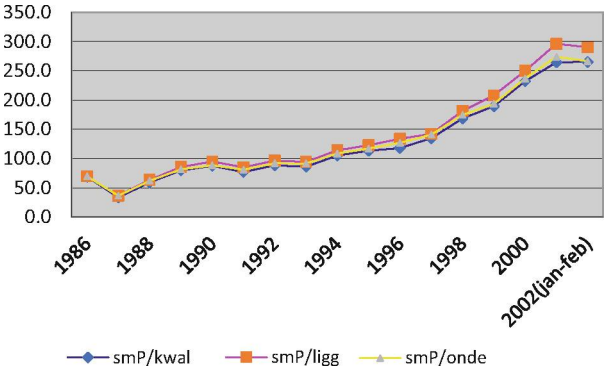


Fig. 3.6 House price development related to quality indicators (for specific segment) in Amsterdam, the Netherlands. (Source: Own calculations; data provided by the tax office (Gemeentebelastingen) of Amsterdam)

reverse is true when the market is cooling down: then pessimists rule and optimists cannot balance the trend by their bids. Because of this glitch in the system, we need the intermediaries to give us a more objective view of the price development. Whether a judgemental or computational outcome, this trajectory needs to be moderated in the ways suggested above, for example, by relating the prices to corresponding income or quality indicators for an available historical data set (Figs. 3.5 and 3.6).

This value stability argument is further explored in Kauko (2017, chs 4–6) and in Kauko (2010). Many would disagree at this junction – their argument would be that 'price is price', a concept always related to the transaction completed in market equilibrium. However, if we talk about value, this diversification of viewpoints makes sense: different groups of actors within property and construction markets focus on different aspects of the economic value of property assets in the market place. This is about extending the value and market framework towards long-term and non-economic factors involving intrinsic value, market psychology, transaction motive and cyclic behaviour (Lorenz et al., 2017).

Conclusions

The starting point taken in this chapter is as to if property cycles can be considered an independent phenomenon or just an expression of economic cycles. How to identify property cycles, so as to be able to prevent their excessive build up in the future? Grover and Grover (2013, 2014a) conclude that a series of cycles of different duration and cause might be a more fruitful conceptualisation rather than holding up a view about one single property cycle. This sounds logical – if for no other reason than the existence of different real estate sectors. However, the issue is more complex than what seems to be the case at first sight.

Considering the global nature of events, it is probably fair to say that macroeconomic and financial aspects are here the most important ones. However, microeconomic (supply and demand, location) and institutional (i.e. law, regulation and policy issues) should not be neglected either. Finally, we also need to take account of behavioural aspects – be it the real estate economist's equilibrium model, behavioural researchers toying with the rationality concept or some more advanced paradigm, such as one related to complexity thinking. To summarise, property cycles and economic cycles are defined by four stages: depression, recovery, boom and recession; these cycles can have both macro- or micro-level causes, the duration of the cycles varies, and they tend to overlap to avoid well-documented problems; policy responses may be necessary to improve the economic or physical sides of the property and housing markets; it is important that responsible valuations include considerations of the effect of the cyclicity on property value. Lastly, an innovative forward-looking approach would arguably move the discussion a quantum leap forwards. Namely, one of the issues that touch all those points above concerns how risk is being comprehended and measured. When a methodology based on historical time-series data fails to work sufficiently, another type of methodology based on subjective risk might be worth looking into. What historic data cannot reveal, an open-minded evaluation of what is going on in demand and supply sectors can be of help. For example, is it likely that restructuring industries or ageing households need less space in the foreseeable future, and, if so, what are then the implications for property value? In such an approach, banks and investors would use the scenario about the development of an individual property asset as the basis for their rating; by the same token, the risk would also concern the individual asset. And when these forecasts are aggregated, we can also say more about the cyclicity of a given asset type at a given location.

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Chapter 4
Addressing Cyclicality Through International Financial Standards



David Parker

Abstract The role of international financial standards generally and valuation standards specifically is considered in the context of providing consistency, clarity, reliability and transparency in valuation reporting. From the viewpoint of managing global contagion, a content analysis of IVS 2017 is undertaken to identify the elements of instructing, undertaking and reporting valuations for financial statement and secured lending purposes. While such formalisation of process provides the benefits of consistency, clarity, reliability and transparency, it is noted that IVS 2017 does not govern the lending decision by debt providers creating a residual global contagion risk. Further, possible contributors to cyclicality including valuation lag, valuation frequency, valuer rotation and ethical conduct are considered within the framework of the International Valuation Standards which are contended to offer some constraints to cyclicality.

Keywords Valuation · Cyclicality · Risk · International Valuation Standards

Introduction

The overarching goal of international financial reporting, accounting and valuation standards is the facilitation of capital mobility globally, being a particularly important issue for international property investment and worldwide corporate real estate. While the international standards framework provides a common approach to the preparation of financial statements and basis for secured lending worldwide, it also potentially increases systemic risk in the financial and capital markets through global contagion.

While the International Valuation Standards have addressed historic problems of "over-valuation" of assets in booming markets, ensuring that assets are valued for inclusion in financial statements and for the purpose of secured lending on a rational

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and supportable basis, market cyclicality may still create temporal issues due to valuation lag.

To investigate the management of such temporal issues in the construction of the International Valuation Standards framework, content analysis of IVS 2017 will be undertaken to identify those mechanisms and provisions inbuilt into IVS which may enable the management of cyclicality within the valuation process.

It may be contended that the identification of those mechanisms and provisions inbuilt within IVS which may enable the management of cyclicality within the valuation process will inform the property industry and the property profession of the range of approaches available to ameliorate the impact of market cyclicality on the valuation process, with such identification also facilitating the suggestion of possible improvements for the future.

Further, the subsequent adoption of such approaches by the property industry and property profession may result in more orderly valuation increases in rising property markets and decreases in falling property markets, so facilitating more informed decision-making.

Literature Review

While there is an extensive literature on the interaction between valuation and property market cycles (see, e.g. Born & Pyhrr, 1994; Hendershott, 2000), relatively little has been written on cyclicality in the context of international financial standards generally and valuation standards specifically.

Parker (2016) outlines the role of the international financial reporting, accounting and valuation standards framework in the facilitation of capital mobility globally with Crosby (2000) considering valuation accuracy and valuation variation in the context of valuation standards.

However, while little has been written on cyclicality and valuation standards, those valuation issues exacerbated by cyclicality have received extensive coverage in the literature including valuation variation and valuation accuracy. Other contributory issues such as valuation frequency and valuation lag as well as valuation ethical issues have received less attention in the literature.

Numerous papers have investigated valuation variation (see, e.g. Adair et al., 1996; Crosby et al., 1998) with Parker (1999) reporting a case study of the simultaneous valuation and sale of commercial, retail and industrial properties in the context of valuation accuracy.

Limited attention has been given in the literature to valuation frequency and valuation lag or appraisal smoothing, with Clayton et al. (2001) finding variation over time as the quantity and quality of contemporaneous transaction information changes. Similarly, limited attention has been given to valuers and ethical issues with Levy and Schuck (2005) investigating the theoretical potential for client influences to bias valuation, Baum et al. (2000) investigating the influence of valuers

and valuations on the UK commercial investment market and Hurley (1996) placing valuers as professionals within a broader ethical framework.

Significantly, relatively little has been written on cyclicality in the context of international financial standards generally and valuation standards specifically with the following seeking to contribute to this gap.

International Financial Reporting, Accounting and Valuation Standards Framework

The aim of international financial standards generally and valuation standards, in particular, is to bring consistency, clarity, reliability and transparency in valuation reporting as:

> *Clients need to understand that a valuation produced in Massachusetts, Manchester, Melbourne, Moscow or Matabeleland is reliable in its standards and methodologies.* (Gilbertson, 2002)

Within the international financial standards framework, the principal standards for consideration are the:

International Financial Reporting Standards (IFRS)
International Accounting Standards (IAS)
International Valuation Standards (IVS)

with a range of national financial reporting, accounting and valuation standards sitting beneath the international standards in those countries that have agreed to be within the international framework.

IFRS and IAS are set by the International Accounting Standards Board which is a not-for-profit public-interest organisation with oversight by a monitoring board of public authorities, having a mission to bring transparency, accountability and efficiency to the financial markets around the world fostering trust, growth and long-term financial stability in the global economy (Elder, 2018).

IVS are set by the International Valuation Standards Council which is an independent not-for-profit organisation that produces and sets standards for the valuation of assets around the world in the public interest, with a mission to establish and maintain effective, high-quality international valuation and professional standards to contribute to the development of the global valuation profession, thereby serving the public interest (Elder, 2018).

As Elder (2018) notes:

> *International standards are high-level principles-based standards that are designed to provide consistency and transparency throughout the profession.* (Elder, 2018, p. 87)

> *We often hear, when speaking about international standards, that the listener is very excited and supportive, but concludes that 'they won't work here – we are different. We have our own culture, legal systems and regulations that make our market different'. This is a fallacy; international standards are designed to work everywhere.* (Elder, 2018, p. 87)

> *The key initial focus is on recognised international standards used by professionals engaged in pricing assets and how they exert influence on market activity. International standards provide a common language for business so that business transactions are understandable across borders. They achieve this by creating a framework for the exchange of information that is consistent and comparable, thereby bringing a common understanding and transparency to market information.* (Elder, 2018, p. 84)

and:

> *It is important to envisage the totality of the individual standards and how each of them can contribute to the creation of an improved transparency for the market, which aids market efficiency.* (Elder, 2018, p. 89)

Elder (2018) argues that the application of an international standards framework serves to reduce imperfections in the property market, with the freer flow of more information creating a transparency that may assist in offsetting such events as the liquidity crisis of 2007 that led to the global financial crisis in 2008.

Further, Elder (2018) contends that the adoption of an international standards framework increases transparency, reduces risk and so increases property values:

> *By reducing risk, the introduction and adoption of international standards can, in certain circumstances, encourage investors to take a longer-term view of their investments. It achieves this by improving market knowledge and providing confidence to the market to make longer-term decisions.* (Elder, 2018, p. 86)

The international framework of standards, therefore, serves to provide a common language to the international financial community and capital markets facilitating the exchange of consistent, comparable information based on a common understanding that provides transparency in market information and knowledge, so reducing risks and facilitating the effective pricing of assets, the global mobility of capital and more efficient markets.

It is ironic that the development of valuation standards is inextricably linked to the cyclical nature of the property market with Parker (2016) identifying three principal phases:

Initial development of valuation standards in the UK:

> Arising from the 1970's UK recession and the 1974 UK property crash, which precipitated a loss of credibility for the valuation profession, RICS established a joint working party with the Institute of Chartered Accountants in England and Wales in 1973 to report on the valuation of property assets, followed by the formation of the Asset Valuation Standards Committee in 1974 which developed guidance notes.
>
> Following Greenwell's (1976) criticism of the traditional capitalisation of income methods as incorrect and illogical and by deduction, leading to inaccurate valuations, RICS responded by establishing a research programme into valuation methods and published *Guidance Notes on the Valuation of Assets* in 1976, the original RICS Red Book, being endorsed by the Bank of England, London Stock Exchange, City Panel on Takeovers and Mergers, banking associations and others.
>
> The Red Book has been regularly updated since, including reflection of the RICS-initiated Trott Report (1980, 1986), Mallinson Report (1994) (incorporated in the 1996 RICS Red Book) and Carsberg Report (2002).

Followed by development of regional European valuation standards:

The European Group of Valuers of Fixed Assets (TEGOVOFA) was created in 1977, now The European Group of Valuers' Associations (TEGoVA), creating a set of regional European valuation standards published in 1981 as the Blue Book or Guide Bleu.

And development of valuation standards internationally:

The International Assets Valuation Standards Committee (TIAVSC) was created in 1981/1982, metamorphosing into the International Valuation Standards Committee in 1996 and the International Valuation Standards Council (IVSC) in 2008, having published the first valuation standards in 1985.

Since 2000, IVSC published IVS reviewed in accordance with IFRS, reflecting international regulatory convergence, with the process coming full circle as the 2003 edition of the RICS Red Book adopted and supported IVS.

The standards promulgated by IFRS, IAS, IVS and RICS are all harmonised and consistent, sitting beneath each other in a hierarchy. Accordingly, IVS are consistent with IFRS/IAS beneath which they sit, and RICS standards are consistent with IVS beneath which they sit and, therefore, are also consistent with IFRS/IAS.

The principal IFRS of relevance for the valuation of property is IFRS 13 *Fair Value Measurement* which provides a framework for the measurement of fair value for and the requirements for disclosure in financial statements, based on the fundamental premise that fair value is a market-based measurement not an entity-specific measurement. For the purposes of the preparation of financial statements, IFRS 13 defines fair value as:

The price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants at the measurement date.

Further, IFRS 5 *Non-Current Assets Held for Sale and Discontinued Operations* is also of relevance for the valuation of property with the principal IASs of relevance for the valuation of property being:

IAS 16 *Property, Plant and Equipment*
IAS 17 *Leases*
IAS 36 *Impairment of Assets*
IAS 40 *Investment Property*

The principal IVS of relevance for the valuation of property are:

General Standards:

IVS 101 *Scope of Work*
IVS 102 *Investigations and Compliance*
IVS 103 *Reporting*
IVS 104 *Bases of Value*
IVS 105 *Valuation Approaches and Methods*

Asset Standards:

IVS 300 *Plant and Equipment*
IVS 400 *Real Property Interests*
IVS 410 *Development Property*

Within the RICS Red Book, the following are of relevance for the valuation of property:

Professional Standards:

PS 1 *Compliance With Standards Where a Written Valuation is Provided*
PS 2 *Ethics, Competency, Objectivity and Disclosures*

Valuation, Technical and Performance Standards:

VPS 1 *Terms of Engagement (Scope of Work)*
VPS 2 *Inspections, Investigations and Records*
VPS 3 *Valuation Reports*
VPS 4 *Bases of Value, Assumptions and Special Assumptions*
VPS 5 *Valuation Approaches and Methods*

Valuation Applications:

VPGA 1 *Valuation for Inclusion in Financial Statements*
VPGA 2 *Valuation of Interests for Secured Lending*
VPGA 4 *Valuation of Individual Trade-Related Properties*
VPGA 5 *Valuation of Plant and Equipment*
VPGA 8 *Valuation of Real Property Interests*
VPGA 9 *Identification of Portfolios, Collections and Groups of Properties*
VPGA 10 *Matters That May Give Rise to Material Valuation Uncertainty*

As IVS have become accepted as the principal International Valuation Standards and the RICS Red Book has become the dominant professional body statement of valuation standards applicable internationally, national valuation professional body standards are becoming less relevant. For example, the Australian Property Institute historically produced a wide range of valuation standards, guidance notes, business focus and client focus papers for use by those members in valuation practice but have now repealed most and adopted IVS supported by jurisdictionally relevant technical information papers such as ANZRP TIP1 *Acting as an Expert Witness*.

Accordingly, from the viewpoint of property market cyclicality, as valuers contemplate undertaking a valuation within a jurisdiction, there is a plethora of IFRS, IAS and IVS, RICS Red Book standards and applications and national professional body standards, guidance notes and so forth for consideration in addition to any statutory and/or regulatory provisions that may be applicable within a particular jurisdiction.

Market Cyclicality and Global Contagion

Globalisation has increasingly gained pace since the end of the Second World War, following the Bretton Woods Agreement on international monetary policy, commerce and finance. The emergence of container shipping and growth in international air travel in the 1970s were early examples of global developments facilitating increasing international integration in trade and commerce. As globalisation evolved, it became apparent that national accounting standards would be both inadequate for and complicate international business and investment with the apparent need for international accounting standards leading to the formation of the International Accounting Standards Committee in 1973 by accounting bodies from Australia, Canada, France, Germany, Mexico, the Netherlands, the United Kingdom, Ireland and the United States (Parker, 2016).

Elder (2018) notes that:

> *The market is now a global market with trillions of dollars being transacted on a daily basis. The real estate markets have followed, with billions of dollars flowing around the globe in cross-border transactions* . . . . (Elder, 2018, p. 85)

and:

> *As markets expand across borders, we have the situation where professionals are working to more than one standard and . . . more than one standard means no standard.* (Elder, 2018, p. 87)

Market cycles exacerbate an already imperfect property market, magnifying issues both positively and negatively and making the already challenging role of the property valuer even more challenging, as summarised by Gilbertson (2002):

> *Deals happen. There is not a perfect market. This imperfection makes a valuer's task very difficult. The valuer has to interpret where the market is going. A valuation is like a snapshot in time.*
>
> *Imagine a photograph containing a ball in flight. Is it actually going up or down? That's what the client wants to know. He would really like to know where the ball will be after an agreed period of time, but that is probably too difficult for all but the crystal ball gazers.*
>
> *Valuers have to reflect, not make, the market. A valuation could be a surrogate pricing process. Whereas, worth is what the purchaser is prepared to pay. What is value? Does value exist? Can value really be measured or is it ethereal?*
>
> *Does a valuer work in the property market, or measure the market in property?*

Whereas property markets of the last century were local and generally unconnected, a negative aspect of globalisation is that property markets are now much more connected with the global flow of capital, in particular debt capital, leading to the risk of simultaneous booms in different world markets and simultaneous busts in different world markets, effectively global contagion.

While such bodies as the International Monetary Fund and the World Bank have a role in managing the risk of global contagion, property markets probably face the greatest risks in the statement of the value of property assets on the equity side of the balance sheet and in the extent and nature of debt on the liabilities side of the balance sheet.

Concerning the statement of the value of property assets on the equity side of the balance sheet, IFRS, IVSC and the RICS Red Book prescribe the requirements for valuation of property for financial statements, such that the basis of the valuation and credibility of the valuation should be consistent around the world. While this does not stop the contagion of falling asset values globally due to a catalyst financial, economic or political event, it provides a high level of transparency around property values for the purposes of managing and containing the contagion.

Significantly, IVS 105 *Valuation Approaches and Methods* explicitly addresses cyclicality in the context of cash flow forecasts within the discounted cash flow method:

> *50.19*
> *Valuers must ensure that seasonality and cyclicality in the subject has been appropriately considered in the cash flow forecast.*

With cash flow forecasts often extending 10 or 20 years into the future, the potential for property market cycles to impact the cash flow over such time periods is considerable. It is interesting, therefore, that the requirement to consider cyclicality while not optional is mandatory ("must") but should be appropriate, leaving scope for valuer discretion in application.

Further, within the context of terminal value, IVS 105 *Valuation Approaches and Methods* explicitly addresses cyclicality:

> *50.21*
> *The terminal value should consider:*
> *(e)*
> *for cyclical assets, the terminal value should consider the cyclical nature of the asset and should not be performed in a way that assumes "peak" or "trough" levels of cash flows in perpetuity (and)*

Interestingly, for terminal value, consideration of cyclicality is optional rather than mandatory ("should") but links closely to para 50.19 so that the mandatory consideration in the latter should provide a robust cash flow for optional consideration in the former. Given that the terminal cash flow is usually capitalised to give a terminal value in the discounted cash flow, adoption of a "peak"- or "trough"-level cash flow would have a significant impact on the NPV or IRR, unless adjusted by the choice of capitalisation rate. It would appear, therefore, that the standard encourages a concept of normalised cash flow by the final year of the DCF, which would be logically consistent with a valuer's limited ability to forecast rise and fall 10 or 20 years in the future.

While the statement of the value of property assets on the equity side of the balance sheet is addressed in international financial standards, it is probably in the extent and nature of debt on the liabilities side of investor's balance sheets that property markets are at the greatest risk from international contagion. The global financial crisis highlighted the extent of massive leverage held by REITs and other investors around the world, with some REITs in Australia exceeding 90% leverage, exacerbated by the nature of debt being commercial mortgage backed securities which were, at that time, incapable of being renewed.

Concerning the statement of the value of property assets for the purposes of secured lending (debt raising) on the liability side of the balance sheet, the RICS Red Book prescribes the requirements for valuation of property for secured lending purposes such that the basis of the valuation and credibility of the valuation should be consistent around the world if undertaken by an RICS member.

Accordingly, in the management of global contagion risk, the international standards framework concerning the valuation process, valuation for financial reporting and valuation for secured lending are critical elements, and these are considered in the following sections.

Valuation Process: Instructing, Undertaking and Reporting the Valuation

The role of the valuation process in addressing valuation during periods of market cyclicality is summed up by Bruhl in Parker (2016):

> *If property investors, property lenders and property valuers around the world followed (the) pithy maxim "say what you are going to do, do it and say what you have done" many of the problems so commonly arising in valuation could be avoided.* (Parker, 2016, Foreword)

The valuation process involves the key stages of instruction between client and valuer, undertaking the valuation by the valuer and then reporting the valuation by the valuer to the client.

The principal IVS of relevance for the valuation process are:

General Standards:

IVS 101 *Scope of Work*
IVS 102 *Investigations and Compliance*
IVS 103 *Reporting*

Within the RICS Red Book, the following are of relevance for the valuation process:

Valuation, Technical and Performance Standards:

VPS 1 *Terms of Engagement (Scope of Work)*
VPS 2 *Inspections, Investigations and Records*
VPS 3 *Valuation Reports*

IVS 101 *Scope of Work* emphasises a dialogue between client and valuer to ensure that both fully understand what is to be provided in the valuation and any limitations on its use before it is undertaken or reported. To ensure such clarity, IVS 101 requires communication of the scope of work by the valuer to the client to include:

Identity of the valuer, be it a group or individual and any material connections that could limit the provision of unbiased and objective valuation advice
Identity of the client for whom the valuation is being produced
Identity of any other intended users
Identity of the asset(s) being valued
The valuation currency
The purpose of the valuation which must be clearly stated in order that valuation advice is not used out of context
The basis/bases of value to be used, which must be appropriate for the purpose of the valuation
The valuation date, which may differ from the date of the valuation report
The nature and extent of the valuer's work and any limitations thereon
The nature and source of information upon which the valuer relies
Identity of any significant assumptions and/or special assumptions
The type of report format to be prepared within which the valuation will be communicated
Any restrictions on the use, distribution and publication of the report
That the valuation will be prepared in compliance with IVS and that the valuer will assess the appropriateness of all significant inputs

with any changes during the course of valuation being undertaken being communicated between valuer and client. These requirements are echoed and amplified in considerably greater detail in VPS 1 *Terms of Engagement (Scope of Work)* in the RICS Red Book.

If each of the above is discussed and agreed between client and valuer, it may be contended that the valuation, when undertaken, should not include any unexpected surprises.

IVS 102 *Investigations and Compliance* then addresses the process of undertaking the valuation by the valuer, requiring any investigations made during the course of a valuation assignment to be appropriate for the purpose of the valuation assignment and the basis of value, such that sufficient evidence is assembled by means such as inspection, inquiry, computation and analysis to ensure that the valuation is properly supported.

IVS 102 further requires the valuer to keep a record of the work performed during the valuation process and the basis for the work on which the conclusions were reached for a reasonable period after completion of the assignment having regard to any relevant statutory, legal or regulatory requirements. Such records should include all key inputs, all calculations, investigations and analyses relevant to the final conclusion together with a copy of any draft or final report(s) provided to the client.

These requirements are echoed and amplified in considerably greater detail in VPS 2 *Inspections, Investigations and Records* in the RICS Red Book which also imports VPGA 8 *Valuation of Real Property Interests* concerning matters evident or to be considered during the inspection of the asset being valued.

Therefore, if appropriate investigations are undertaken and appropriate records are maintained, the process of undertaking the valuation should be transparent and explicable both at the time of undertaking and at a later date should any form of review or investigation be required.

IVS 103 *Reporting* clearly states:

> *It is essential that the valuation report communicates the information necessary for the proper understanding of the valuation or valuation review. A report must provide the intended users with a clear understanding of the valuation.* (IVS, 2017, para 10.1)

with VPS 3 *Valuation Reports* unambiguously asserting:

> *The report must: clearly and accurately set out the conclusions of the valuation in a manner that is neither ambiguous nor misleading, and which does not create a false impression. If appropriate, the valuer should draw attention to, and comment on, any issues affecting the degree of certainty, or uncertainty, of the valuation . . . ; deal with all the matters agreed between the client and the valuer in the terms of engagement (scope of work) (see VPS 1).* (RICS, 2017, p. 54)

While foreshadowed in IVS 101, IVS 103 requires that the report include:

A clear and accurate description of the scope of the assignment and its purpose and intended use (including any limitations on that use)
The approach or approaches adopted
The method or methods applied
The key inputs used
Disclosure of any assumptions, special assumptions, significant uncertainty or limiting conditions that directly affect the valuation
The conclusion(s) of value and principal reasons for any conclusions reached
The date of the report, which may differ from the date of valuation

with the level of detail appropriate for the valuation report being determined by the purpose of the valuation, the complexity of the asset being valued and the user's requirements while being sufficient for an appropriately experienced valuation professional with no prior involvement with the valuation engagement to review and understand the report.

VPS 3 *Valuation Reports* echoes and amplifies these requirements in considerably greater detail and in close alignment with the requirements of the instructions specified in VPS 1 *Terms of Engagement (Scope of Work)*.

Hence, the report should simply be confirming that which the valuer and the client have previously agreed would be undertaken and so should contain no surprises for the client but merely the codification of that which was agreed to be undertaken.

Valuations for Financial Statements

Given the critical importance of financial statements for a wide range of businesses and not-for-profit, government and other entities around the world, consistency in the measurement of the value of property assets is fundamental to confidence in the financial statements upon which many capital budgeting, takeover/merger, lending and other decisions are based.

Assets are required to be stated in financial statements at fair value. As noted above, IFRS 13 *Fair Value Measurement* provides a framework for the measurement of fair value and the requirements for disclosure in financial statements, based on the fundamental premise that fair value is a market-based measurement not an entity-specific measurement. For the purposes of the preparation of financial statements, IFRS 13 defines fair value as:

> *The price that would be received to sell an asset, or paid to transfer a liability, in an orderly transaction between market participants at the measurement date.*

Parker (2016) notes that the IVSB has previously pronounced that the definition of *fair value* in IFRS is generally consistent with the definition of *market value* in IVS, having regard to, in particular, the reference to market participants, an orderly transaction, the transaction taking place in the principal or most advantageous market and the highest and best use of the asset.

Accordingly, therefore, the valuation of property assets at *market value* as defined by IVS and RICS Red Book may be likely to meet the requirements of directors and officers seeking to determine *fair value* for the purposes of IFRS 13 for those assets covered under IAS 16 *Property, Plant and Equipment* and IAS 40 *Investment Property*.

VPGA 1 *Valuation for Inclusion in Financial Statements* in the RICS Red Book, while not mandatory, provides advice to valuers on key issues likely to be encountered when valuing property for financial statement purposes. VPGA 1 advocates care be taken to ensure strict compliance with applicable financial reporting standards at the date of valuation, with an emphasis on IFRS 13 where relevant and International Public Sector Accounting Standards (IPSAS) where relevant together with jurisdictionally specific legislative, regulatory and accounting requirements.

In the valuation of development property for financial statements purposes, IVS 410 *Development Property* notes that the valuation requirements may be affected by whether the property is classified as being held for sale, for owner occupation or for investment with the going concern assumption meaning that any relevant construction, leasing or other contracts would pass to the hypothetical buyer in the hypothetical exchange, even if not assignable in reality.

In common with valuations for secured lending considered further, below, valuations for financial statements may be likely to include forecasts, particularly if a discounted cash flow method of valuation is adopted. Given the challenges of forecasting rental growth rates, expense growth rates, future capital expenditure and terminal capitalisation rates, there is considerable scope for a divergent potential

range of outcomes further exacerbated in periods of market peaks and market troughs where boom time conditions may often be assumed to last forever or bust period conditions may often be assumed to never end.

To ameliorate the risks inherent in forecasting within the valuation process, IVS focus on the explicit forecast period, the cash flow forecasts, the terminal value and the discount rate:

> Paragraphs 50.8–50.11 of IVS 105 *Valuation Approaches and Methods* address explicit forecast periods, requiring the valuer to have regard to the purpose of the valuation, the nature of the asset and the required bases of value when selecting a forecast period.
>
> Paragraphs 50.12–50.19 of IVS 105 *Valuation Approaches and Methods* address cash flow forecasts and require projected income/inflows and expenditure/outflows (prospective financial information (PFI)) to be based on assumptions appropriate for the valuation purpose and bases of value with the periodic intervals selected depending on the nature of the asset, the pattern of the cash flow, the data available and the length of the forecast period.
>
> Paragraphs 50.20–50.22 of IVS 105 *Valuation Approaches and Methods* address the assessment of terminal value, requiring the valuer to consider whether the asset is deteriorating, of a finite life or indefinite, the extent of future growth for the asset, the risk level of the asset at the end of the cash flow period and any potential tax attributes.
>
> Paragraphs 50.29–50.31 of IVS 105 *Valuation Approaches and Methods* address the discount rate, requiring the valuer to reflect not only the time value of money but also the risks associated with the type of cash flow and the future operation of the asset.

Accordingly, international financial standards serve to ensure that all property assets valued for financial statements are undertaken on a common basis with the resulting valuations being comparable without adjustment. This provides a high level of transparency on the asset side of the financial statements of REITs, institutions and other property investors around the world who adopt international financial standards and ensures that assets in each country are consistently reported regardless of where that country may be on the property cycle.

Therefore, those countries close to the top of the property cycle may be recording property assets at high values in financial statements, and those close to the bottom of the property cycle may be recording property assets at low values in financial statements, with each being reflective of current market conditions prevailing at the time and prepared on a common and consistent basis.

Valuations for Secured Lending

As surely as night follows day, in periods of cyclical upturn when property values are rising, many REITs, investors and property owners will seek to increase the level of debt secured against their properties, and in the ensuing periods of cyclical downturn, the falling values of their properties will start to place pressure on their debt covenants and often prompt sale into a falling market.

While international financial standards cannot deal with the behaviour of REITs, investors and property owners, they can address the consistent valuation of property assets on a common basis so that lenders clearly understand the nature of the security for their loan.

VPGA 2 *Valuation of Interests for Secured Lending* in the RICS Red Book, while not mandatory, provides advice to valuers on key issues likely to be encountered when valuing property for secured lending purposes. VPGA 2 emphasises the importance for the valuer of independence, objectivity and avoiding or managing conflicts of interest, citing PS 2 *Ethics, Competency, Objectivity and Disclosures* which is mandatory upon RICS members.

VPGA 2 focuses on previous (i.e. within 24 months), current or anticipated involvement between the valuer, their firm and the borrower, the asset being valued or any other party connected to the transaction with a requirement for full disclosure to the lender prior to acceptance of the instruction in order to avoid conflicts of interest.

VPGA 2 continues to require the valuer to enquire if there has been a recent transaction or provisionally agreed price for the property to be valued for secured lending purposes. If so, the valuer is encouraged to make further enquiries about, for example, the extent of marketing, the effect of any incentives, whether the price agreed was the best obtainable and so forth. The valuer is further required to request the details of the terms of the lending facility being contemplated by the lender.

While VPGA 2 envisages the basis of value for secured lending to be likely to be market value, it notes certain jurisdictions may have specific requirements such as *mortgage lending value* in Europe and *sustainable* or *long-term value methods*.

Concerning reporting, VPGA 2 requires disclosure of any involvement, whether a recent transaction of the property has occurred, comment on the suitability of the property as security for mortgage purposes give the length and terms of the loan being contemplated and any assumptions or special assumptions together with extensive context commentary on the property and the market.

In the valuation of development property for secured lending purposes, IVS 410 *Development Property* notes that, while market value is normally the appropriate basis, consideration should be given to the prospect of construction, leasing and other contracts becoming void or voidable in the event of one of the parties becoming insolvent and highlight the risk to the lender caused by a prospective buyer not having the benefit of such contracts and associated warranties and guarantees.

Therefore, those lenders receiving a valuation compliant with VPGA 2 should be aware of a wide range of potential and actual risks that may affect the property's suitability for loan security and upon which they can make an informed lending decision. In periods of cyclical upswing, this should allow lenders to approach potential loans on properties with caution and prudence having regard to the current state and direction of the market.

International financial standards, through managing valuation process, valuations for financial statements and valuations for secured lending, provide checks and

balances for valuations through the market cycle. However, other relevant issues in the context of valuations within market cyclicality include valuation lag, valuation frequency, valuer rotation and ethical conduct which are addressed, sequentially, below.

Valuation Lag

A critical issue in the valuation process in periods of cyclical upturn and cyclical downturn is valuation lag, whereby a valuation cannot reflect value at exactly the date of valuation but only value at the date of the most recent relevant comparable transaction.

For example, as markets rise, a sale/purchase transaction of an office building may commence negotiation on 1 January 2017 and be agreed on 1 July 2017 which is primary evidence of value levels in the office market on 1 January 2017. However, the transaction may not settle until 1 September 2017 such that it may not be considered reliable evidence for valuation purposes until 1 September 2017 and merely indicative in the interim. If a valuation of another office building is undertaken on 1 January 2018, it may have regard to the previous sale but, by this point, it will be evidence of market conditions 12 months prior. Therefore, due to the nature of the comparable sales process, valuations are always lagging the market.

The situation may be more challenging in a falling market where no transactions are being undertaken, as occurred during the global financial crisis. While market participants may agree that the value of office properties in a market is falling, in the absence of transactions, the rate of fall and prevailing value levels are unobservable such that the lag between a valuation and the most recent prior transaction may become very lengthy.

Valuation lag would, therefore, appear to represent a fundamental flaw in the application of international financial standards, which are essentially reliant on a continuous flow of up-to-date information on prevailing pricing levels in a market. However, international financial standards do not preclude the application of judgement by the valuer based on experience as to the extent to which a market may have risen or fallen since the last transaction. Such judgment is, however, highly sensitive such that the provisions of international financial standards concerning ethical conduct become particularly important, as are considered further below.

Valuation Frequency and Valuer Rotation

Closely linked to the issue of valuation lag is the issue of valuation frequency. In most office, retail and industrial property markets, transaction numbers are relatively small and spread out over any given time period. While the underlying property market may be in a constant state of change, in a cyclical upturn or cyclical downturn, evidence of value levels through transactions in that market are only intermittently available.

Generally, valuations for financial statements will be undertaken annually though some property funds may seek half yearly and quarterly updates. It is generally held that annual revaluation represents a reasonable balance between sufficient frequency and sufficient availability of transaction evidence to observe movements in the market. More often than annually and transaction evidence may be insufficient to clearly show a market trend, whereas longer than annually may see the market straying unacceptably far from the last valuation estimate.

Also linked to the issue of valuation lag and valuation frequency is the issue of valuer rotation, which comes sharply into focus in periods of cyclical upturn and cyclical downturn. The conventional argument suggests that a truly independent view on the value of a property will only be obtained if a different valuer undertakes the valuation each time, so removing any risk of serial bias in valuation estimates. The alternative argument suggests that there are economies in having the same valuer undertake the valuation repeatedly, as the valuer becomes familiar with the property and its place in the market, but the issue then becomes how many repeat valuations are acceptable before a valuer becomes too familiar with the property and potentially complacent?

Within the RICS Red Book, PS 2 *Ethics, Competency, Objectivity and Disclosures* addresses valuer rotation policy. PS 2 acknowledges that a valuer who undertakes the valuation of the same property for many years may become familiar with the asset or the client such that a perception may arise that the valuer's independence or objectivity may have been compromised, with this risk being addressed by arranging rotation of the valuers undertaking the valuation task.

PS 2 recommends rotation after "a limited number of years" with the exact period depending on the frequency of valuation, any control and review procedures in place such as valuation panels and good business practice, with rotation between valuers within the same firm if that firm is of sufficient size, disclosure of the frequency of being the valuation signatory and a disclosure statement as to whether the proportion of fees from that client for the firm during the preceding year is minimal, significant or substantial. PS 2 notes that RICS considers it "good practice" to rotate valuers at intervals not exceeding 7 years.

Accordingly, within the international financial standards framework, the issue of valuer rotation receives specific attention, whereas the issue of valuer rotation is addressed by convention, and the issue of judgment in addressing valuation lag becomes a matter of ethical conduct.

Role of Ethical Conduct

Given the significance of the role of the judgment, experience and competence of the individual valuer in the valuation process, the ethical conduct of the valuer becomes paramount, and this is primarily governed within the international financial standards framework by the professional bodies, such as RICS, rather than by the IASB or the IVSC.

As the International Valuation Standards Council notes:

> *We believe that International Valuation Standards (IVS) are a fundamental part of the financial system, along with high levels of professionalism in applying them.* (IVS, 2017)

Paragraph 50 of the IVS Framework addresses *Competence* and specifies that:

> 50.1
> Valuations must be prepared by an individual or firm having the appropriate technical skills, experience and knowledge of the subject of the valuation, the market(s) in which it trades and the purpose of the valuation.
> 50.2
> If a valuer does not possess all of the necessary technical skills, experience and knowledge to perform all aspects of the valuation, it is acceptable for the valuer to seek assistance from specialists in certain aspects of the overall assignment, providing this is disclosed in the scope of work and the report.
> 50.3
> The valuer must have the technical skills, experience and knowledge to understand, interpret and utilise the work of any specialists.

The RICS Red Book notes:

> *Consistency, objectivity and transparency are fundamental to building and sustaining public confidence and trust in valuation. In turn their achievement depends crucially on valuation providers possessing and deploying the appropriate skills, knowledge, experience and ethical behaviour, both to form sound judgments and to report opinions of value clearly and unambiguously to clients and other valuation users in accordance with globally recognised norms.* (RICS, 2017, p. 2)

The RICS Red Book supports this through the provision of three interrelated forms of standard:

Professional standards – centred on ethics and conduct, underpinned by knowledge and competence

Technical standards – centred on common definitions and conventions, underpinned by consistent application through recognised approaches

Performance or delivery standards – centred on rigour in analysis and objectivity or judgment, backed by appropriate documentation and clarity when reporting. (RICS, 2017)

together with the valuer being a member of and therefore governed by RICS.

Within the RICS Red Book, PS 2 *Ethics, Competency, Objectivity and Disclosures* deals at length with issues of professional and ethical standards, the RICS Rules of Conduct, valuer appropriateness for the valuation task to be undertaken, disclosure, reliance by third parties and the critical issues of independence, objectivity, confidentiality and the identification and management of conflicts of interest.

PS 2 focuses on RICS members having the appropriate technical skills, experience and knowledge of the subject of valuation, the market and the purpose of the valuation such that they meet or exceed the standards for conduct and competency of professional valuers promoted by IVSC. Given the significance of the role of judgment, members are required to act at all times with integrity, avoid any actions

or situations that are inconsistent with their professional obligations, not allow conflicts of interest to override their professional or business judgment and obligations and not divulge confidential information.

In order to determine if a valuer is appropriately qualified to accept responsibility for a valuation, PS 2 requires satisfaction of the following criteria:

Appropriate academic/professional qualifications, demonstrating technical competence
Membership of a professional body, demonstrating a commitment to ethical standards
Sufficient current local, national and international (as appropriate) knowledge of the asset type and its particular market and the skills and understanding necessary to undertake a valuation competently
Compliance with any country or state legal regulations governing the right to practise valuation

The importance of identifying and managing conflicts of interest is addressed in detail in PS 2 which notes:

> *3.3*
> *Bringing the required levels of independence and objectivity to bear on individual assignments, respecting and maintaining confidentiality, and identifying and managing potential or actual conflicts of interest are of crucial importance.* (RICS, 2017, p. 25)

Accordingly, the IVSC and to a greater extent the RICS Red Book provide detailed guidance to a valuer concerning the framework surrounding the exercise of judgment and the role of experience and competence in the valuation process which, if followed, should ameliorate any erroneous judgements in the more extreme phases of property market cyclicality.

Policy Responses

While the international financial standards framework does much to ameliorate the potential impact of property market cyclicality through varying forms of risk management and mitigation, some risks may only be capable of being addressed through policy responses at a national or international level.

The global financial crisis of 2007/2009 clearly showed the close nexus between property market collapses and banking collapses with the international nature of property investment today meaning that, in the event of international property market collapse contagion, the risk of international banking collapses is magnified.

Accordingly, a national and international policy response is required to address the issue of property market valuations and bank lending, in order to minimise the effect on the banking system of a property market collapse.

One part of such a response may be a co-ordinated international position on valuation frequency within the general provision of continuous and regular revaluation of property assets. Adoption of a formalised annual valuation requirement (or ongoing valuation of one quarter of a property portfolio every quarter) may assist in maintaining currency of valuations, but the problem of insufficient comparable sales evidence remains.

Further, consistent and more regular valuations do not address the problem of property market bubbles as comparable evidence, by its nature, exacerbates a bubble. Further research is, therefore, required concerning the relativity of property value movements to those of other asset classes with the aim of identifying when a property market is simply in a state of "new normal" and when it is in a bubble state.

A further part of such a national or international policy response may be a co-ordinated international position on property lending as a proportion of property value. A global shift to capping lending on individual properties held in managed funds would serve to clearly delineate the equity risk of investors in such funds compared to the debt risk of lenders, potentially leading to an adjustment in the equity risk premium and a repricing of property. A modest debt cap could provide greater security to banks and therefore to the international banking system which would be beneficial for global financial and capital markets.

While IFRS, IVS and the RICS Red Book may assist in managing the process of valuing property assets for secured lending, they do not impact on the form of lending or the level of lending which are decisions for the lending bank or entity. Interestingly, in the REIT markets, some countries introducing REIT regimes have chosen to regulate the level of debt or leverage to be held by a REIT with Spain placing constraints on leverage, India having a gearing limit of 49% with a requirement to provide a credit rating and obtain unitholder approval if gearing is to exceed 25% of the value of assets and Thailand and South Africa maintaining a 60% limit, with the latter also requiring a risk monitoring committee.

Therefore, through policy responses addressing valuation frequency and debt control, national and international policy settings could complement the contributions of the international financial standards framework in ameliorating the potential impact of property market cyclicality.

Summary and Conclusions

Through international financial standards, IASB, IVSC, RICS and national professional valuation bodies have sought to clarify and codify that which should happen in the valuation process, such that valuations produced for financial statement purposes or secured lending purposes are consistently produced around the world and are transparent, so engendering confidence from financial markets and capital markets users.

If valuers follow each of the respective body's standards, valuations produced anywhere in the world will be on a commonly understood basis and easily interpretable. However, the extent to which such a valuation mirrors the market at the valuation date is challenged by valuation lag with the infrequency of trading of assets in the direct property market conspiring against the currency of valuation.

Much therefore rests on the valuer himself (or herself) and their judgment, objectivity and interpretation of the market which cannot be controlled by the black letter regulation of standards and which comes sharply into focus at the extreme end of property market cyclicality close to the peak of booms and at the trough of market collapses. Given the dependence at such points in the property market cycle on the valuer alone, those international financial standards concerning ethical conduct and the codes of conduct and member regulation of professional bodies become the principal control mechanism for the valuation process at the extremes of property market cyclicality.

There is, however, scope to further ameliorate the potential effects of the extremes of property market cyclicality through policy responses in such areas as valuation frequency and the use of debt, both of which go to the core issue for international financial markets and capital markets of reducing the strength of the link between property markets and the banking sector that has so often in the past manifested in property market collapses being a precursor to banking collapses.

A co-ordinated international position on valuation frequency within the general provision of continuous and regular revaluation of property assets would form a timely basis for property lending decisions, and a co-ordinated international position on property lending as a proportion of property value, with a modest debt cap, could provide greater security to banks and therefore to the international banking system which would be beneficial for global financial and capital markets.

There are, therefore, a wide range of approaches available within international financial standards to ameliorate the impact of property market cyclicality on the valuation process, though the valuation profession at large internationally may not be fully aware of same. Coupled with relevant policy changes, international financial standards provide the property industry and property profession with a mechanism by which there may be more orderly valuation increases in rising property markets and decreases in falling property markets, so facilitating more informed decision-making in periods of property market cyclicality.

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Chapter 5
Dealing with Cyclical Assets



Maurizio d'Amato and Malgorzata Renigier Bilozor

Abstract Upturns and downturns of economic cycles may influence real estate market. The importance of real estate market cycle has been stressed in several contributions (Born and Pyhrr, 1990; Grover & Grover, 2013a, b). Although the great importance of the property market cycle for real estate market analysis, a gap between property valuation and property market cycle has been observed (Born and Pyhrr, 1990). Recently, the International Valua\tion Standards raised the problem of valuation of cyclical assets as terminal value of discounted cash flow analysis (IVS, 2017, General Standards IVS 105 Valuation Approaches and Methods, para 50.21 letter e). The recommendation of the International Standard is to replace traditional direct capitalization with valuation methods considering "...the cyclical nature of the asset...". This chapter shows the limits of the present valuation practice in the context of property market cycle. It will be stressed how property market cycle influences property valuation. As a consequence, it is more and more relevant providing solutions to include property market cycle in the valuation process enhancing present valuation methods.

Key words Property market cycle · Income approach · Valuation

Authors Maurizio d'Amato and Malgorzata Renigier Bilozor have equally contributed to this chapter.

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Introduction

Uncertainty is a relevant problem when delivering a property valuation report. In particular "...Valuation uncertainty should not be confused with uncertainty risk. Risk is the exposure that the owner of an asset has to potential future losses. Risk can be caused by various factors affecting either the asset itself or the market in which it trades..." (IVSC, Technical Information Paper 4, Valuation Uncertainty, para 11). In the valuation process, it is possible to observe three "sources of uncertainty". These three components are market disruption, input availability and choice of method of model (IVSC, TIP Valuation Uncertainty 4, para 17). Among others, there is the *input availability* "...in a discount cash flow model the cash flow inputs are based on current expectations for future performance and are therefore uncertain" (IVSC, TIP Valuation Uncertainty, para 25). For this reason, research focused on improving the valuation models may help in diminishing the weight of this kind of uncertainty in the professional activity of the valuer.

The International Valuation Standards warned on the determination of terminal value in the discounted cash flow (DCF) analysis with the following words "...for cyclical assets the terminal value should consider the cyclical nature of the asset and should not be performed in a way that assumes 'peak' or 'trough' levels of cash flows in perpetuity..." (IVS, 2017, General Standards – IVS 105 Valuation Approaches and Methods, para 50.21 letter e).

The terminal/scrap/going out/exit value is an important component of the property valuation method defined as discounted cash flow analysis. This method has been defined as an indication of value "...whereby forecasted cash flows are discounted back to the valuation date, resulting in a present value of the asset or business. A terminal value at the end of the explicit forecast period is then determined and that value is also discounted back to the valuation date to give an overall value for the asset or business..." (IVSC, TIP 1 Discounted Cash Flow, para 6).

The final output of this method is dependent on several inputs such as the variations of rental rates, discount rates and exit yields (Skolnik, 1993). An empirical analysis by Graaskamp (1969) highlighted for the first time the use of DCF as property valuation method among property managers in the USA. The increased importance of the market cycle may be one of these reasons for the growing preference for the DCF model (Roulac, 1996; Phyrr et al., 1999).

In the period between 1960 and 1980, there were several pioneering contributions by Downs (1996), Ratcliff (1972) and Dilmore (1971). A number of inherent issues like the role of uncertainty and forecasting inside DCF (French and Cooper, 2000), the weight of developing a reliable cash flow analysis (Willison, 1999) and the influence of vacancy and market analysis (Rabianski, 2002; Born and Phyrr, 1990; d'Amato and Kauko, 2008; Renigier et al., 2019; Renigier et al., 2018) have been recently explored. Other recent contributions have highlighted the relationship between inputs and the final output (Taylor & Rubin, 2002; Wheaton et al., 2001; Hendershott & Hendershott, 2002). Hutchinson and Nanthakumaran (2000) investigated the relationship between the following key rates and the final value: passing

rents, rental growth rate, holding period, exit yield and discount rate. Millington (2000, p. 187) asserted that this method can be ". . .accurate, but it can also be very inaccurate, and the degree of accuracy will depend upon the accuracy of the valuation inputs".

Whilst it is easy to agree with the recommendations proposed by the International Valuation Standards, they open a new important methodological question requiring the valuer to understand how to appraise the terminal value of properties defined as "cyclical asset". Intuitively, a correct application of discounted cash flow analysis is depending on it. The same concerns raised by the International Valuation Standards may be raised in the direct capitalization that is a discounted cash flow analysis without holding period.

The present chapter is focused on the relationship between property valuation and market cycle. Observing how property market cycle influences property valuation methods allows us to understand better its importance (IVSC 2012, 2013). Observing how property market cycle influences property valuation methods allows us to understand better the needs to take it into account. In the following section, a literature review on the relationship between property valuation and property market cycle is provided. Section "Direct capitalization, terminal value and property market cycle" focuses on how the real estate market cycle influences the variables normally included in a property valuation model both in the Commonwealth and in the US professional practice. Finally, section "Conclusions" provides some conclusions and future directions of research.

Property Market Cycle: Literature Review

". . .The existence of a cyclical motion implies that there are weak adjustment mechanisms in the property market. An external shock could then cause it to continue to oscillate for some time. Property markets are subject to exogenous shocks from a variety of causes. . ." (Grover & Grover, 2013a, b). Few contributions in literature explored the relationship between property market cycle analysis and property valuation methods. The role of cyclicality in the real estate market has been analysed in several scientific contributions. In his pioneering work, Hoyt (1933) examined land values in Chicago between 1830 and 1933 and described for the first time the Chicago real estate cycle. Hekman (1985) observed the cycle in the office sector in 14 cities over the 1979–1983 period, whilst Voith and Crone (1988) observed the cyclicality nature of vacancy rates in 17 office market metropolitan areas. In the USA, Roulac (1996) analysed the relationships among economy, office demand, office construction, property values, volume of transactions, capital for real estate, investor interest and tax climate factors. In a further contribution, Mueller and Laposa (1996) provided an analysis on rent distributions affected by different market cycles. Case and Shiller (1989) and Borio et al. (1994) demonstrated the cyclical nature of real estate prices. Grebler and Burns (1982) investigated cyclicality in six residential and four non-residential construction cycles in the USA between 1950

and 1978. A research on price-income relationship allowed Pritchett (1984) to discover that vacancy rate can be considered the best indicator of the cycle. Pyhrr et al. (1990) managed to provide an overview on the role of market cycle in real estate market analysis. Dokko et al. (1991) showed how local and macroeconomic conditions move together generating cyclical outcomes for local real estate markets. Grenadier (1995) observed and analysed the causes and consequences of prolonged cycles, or persistence, in property markets. Roulac (1996) gave a relevant qualitative study on the importance of cyclical relationships. He concluded that real estate markets are influenced by the economy, office demand, office construction, property values, volume of transactions, capital for real estate, investor interest and tax climate factors. Canadian commercial property prices have been observed by Clayton (1996). Mueller and Laposa (1996) explored rent distributions in different market cycle phases. Renaud (1997) discussed about the globalization of financial markets on property markets around the world, showing the international and domestic factors that contributed to the global property cycle. Björklund and Söderberg (1999) discussed about the influence in the 1980s of a speculative bubble on the Swedish property market cycles. Dokko et al. (1999) proposed a cycle model based on the linkage between property value and net operating income. Grissom and DeLisle (1999) offered a macroeconomic approach exploring the relationship between real estate market cycle with GNP, interest rate, unanticipated inflation, tax shelter and capital gains. In a later paper, Roulac et al. (1999) underlined the importance of the property market cycle for investment and portfolio management. The correlation among property market cycle and different kinds of economic cycles has been highlighted in a further analysis showing the volatility of property market cycle in periods of speculation (Witkiewicz, 2002; Wheaton, 1999). In Rottke et al. (2003), there is a first attempt to include market cycle analysis in the real estate management process. Malpezzi and Watcher (2005) analysed the role of speculation in the real estate property market cycles demonstrating that land speculation is the primary cause of property market cycles. Funcke and Paetz (2013) found how property prices are driven by intratemporal preference perturbations instead of disturbances in financial frictions or price mark-up shocks. An interesting classification of the temporal length of the property market cycle showed several differences; according to Grover and Grover (2013a, b), it is possible to classify four different kinds of property market cycles: a 3- to 5-year inventory cycle (the "kitchen" cycle), a 7- to 11-year major cycle associated with fixed investment (the "Juglar" cycle), a 15- to 25-year-long swing associated with population changes or with transport infrastructure investment (the "Kuznets" cycle) and a 45- to 50-year-long wave associated with major innovations (the "Kondratiev" cycle). Referring to the temporal length of property market cycle, Scott and Judge (2000) analysing British commercial property values in the interval between 1956 and 1996 suggested a property cycle of 7–8 years for the British commercial property market. Four building cycles of different durations were observed by the fundamental work of Barras (2009): a first one endogenously generated building cycle from 8 to 10 years, a shorter cycle from 4 to 5 years mainly caused by demand influence of the business cycle, a 40–50-year-long wave caused by the effect on technological improvements

and finally a 15–20-year-long cycle subjected to speculative investment. Two different cycles have been identified for the commercial property market by Ball and Grilli (1997): the former long cycle running from 1955 to 1980 and a latter shorter one from 1980 to 1996. The greatest part of the contributions focused on the property market cycle analysis with few integration with property valuation profession. On the other side, the International Valuation Standards focused the attention on the role of the property market cycle for valuation purposes introducing the concept of "cyclical asset" in order to avoid the boom-bust effect of the property market cycle and the consequences of the bubble on the economic system. Bubbles exist "when prices are in excess of their fundamental values because investors assume that they may sell their properties for a higher value tomorrow" (Grover & Grover, 2013a, b). This happens when the fundamental value of an asset is determined by the income received over the time. The market value grows on the over than the fundamental value for several reasons as excess demand or irrational expectations. The introduction in the International Valuation Standards of the definition of the cyclical asset showed the growing role of the market cycle in the professional activity of valuers. Rational valuations are strongly dependent on the fact "...that changes in observed prices are reflected rationally in changes meaningful variables..." (Baum and Crosby, p. 8).

Direct Capitalization, Terminal Value and Property Market Cycle

The need of a methodological bridge between real estate market cycle and property valuation is not a recent event. Several studies attempted in the past to fulfil the bridge between property market cycle and property valuation. Kazdin was among the first to stress the importance of including business cycle in capitalization rate calculation (Kazdin, 1944). Trying to fill the gap between real estate market analysis and property valuation, Born and Pyhrr (1990) stressed the problem that the application of DCF analysis compels the appraiser to make three heroic assumptions "(1) constant rates of change in rents and operating expenses over time, (2) a constant overall capitalization rate to convert NOI into market value at the end of the projection period (generally ten years) and (3) a stabilized vacancy rate over the projection period. This is a static modelling that is incompatible with the dynamic market it seeks to measure..." (Born and Pyhrr, 1990, p. 456). In the same way, a further attempt to import property market cycle analysis in the valuation process result is invoked in a further contribution (Dokko et al., 1999). These attempts have been made because of the characteristics of income approach. The application of income approach is based on the assumptions of a proportional relationship between rent and property value. It is possible to observe several different models. They are normally applied in the determination of scrap value both in the DCF and in the traditional direct capitalization. The former is the capitalization of a rack rent for an all risks yield as in the formula 5.1 below:

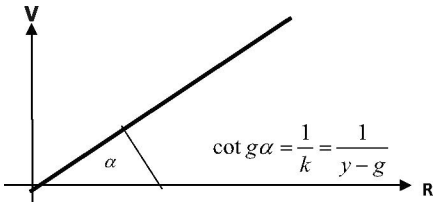


Fig. 5.1 Graphical relationship between property value and property rent. (Own elaborations)

$$V = \frac{R}{k} \tag{5.1}$$

In the formula (5.1), V stands for value, and R is the rack rent of the property, whilst k stands for all risks yield rate. The application of the model is based on the assumption of a stable rent over the time. In this case, we use the Commonwealth terminology. It is possible to assume a variable rent growing at a rate g. In this case, the income capitalization formula would be modified using the dividend discount model (Gordon & Shapiro, 1956; Gordon, 1962) as in the following formula 5.2:

$$V = \frac{R}{y - g} \tag{5.2}$$

In the formula 5.2, R is the rack rent, V is the value, and y is the discount rate or target rate of return, whilst g is the growth rate. This difference determines the initial yield. In the application of direct capitalization indicated in the formula 5.1 (normally for the determination of market value), the effects of the market cycles are supposed to be included in the choice of a stable rent capitalized at unique and constant yield rate. On the other side, the formula 5.2 is considered for the determination of investment value. Observing both the formula 5.1 and the formula 5.2, it is possible to see the proportional relationship between property value and property rent. Rearranging both formulas as follows:

$$\begin{aligned} V &= \frac{R}{k}; V = \frac{1}{k}R \\ V &= \frac{R}{y - g}; V = \frac{1}{y - g}R \end{aligned} \tag{5.3}$$

It seems evident from the formula 5.3 that the relationship between value and rent may be interpreted as a straight line passing from the origin. The overall capitalization rate or the all risks yield is the fundamental part of the angular coefficient of this straight line. Angular coefficient can be represented as the cotangent of angle alpha indicated in Fig. 5.1.

In the application of direct capitalization as in the application of the discounted cash flow analysis, the choice of a constant cap rate (according to US terminology) or all risks yield (according the Commonwealth terminology) is based on a constant relationship between property value and property rent. In reality, both value and

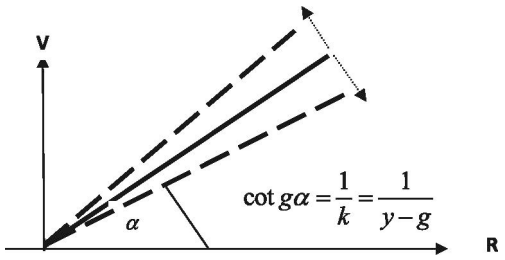


Fig. 5.2 Graphical relationship between property value and property rent. The role of the property market cycle. (Own elaborations)

rents are influenced by property market cycle, and whilst the cap rate (or all risks yield rate) selected by the appraiser in the valuation process is constant, property market cycles may affect alpha angle as in Fig. 5.2.

The variation caused by the influence of property market cycle may determine a change in the supposed constant relationship between property market value and property market rent. As a consequence, a long-term value or an accurate property valuation should consider the range of variation caused by the change all over the time in property value and property market rent. An accurate estimation of this interval may allow the appraiser to reach an accurate opinion of value and an acceptable valuation accuracy. The specific influence of property market cycle can be clarified observing both the formula 5.1 and the formula 5.2. The application of the formula 5.1 is based on either a constant rent or overall capitalization rate or all risks yield. Applying the formula 5.2 is supposed that the rent is always increasing at a constant term called g (growth factor) which can be positive or negative. Both models of direct capitalization present similar criticisms. In the overbuilt real estate market phase, valuations relying on past information because of appraisal bias may increase the speculative bubble. In the recession phases, valuations based on the formulas 5.1 and 5.2 may amplify the recession phase because the "stable" net operating income and yield rate are based on comparables collected in the difficult phase of the market, even if property. In the same way, assuming an ever-growing rent may be a heroic and unreal assumption. For this reason, traditional value techniques are successfully applied in stabilized and even accelerated growth periods, but can be considered weaken and even break down during down markets (DeLisle & Grissom, 2011).

Starting from the well-known Baum and Crosby (1988) and referring to the Commonwealth terminology used for property investment, formula on the calculation of the all risks yield can be calculated as follows:

$$k = \mathrm{RFR} + r - g + d \tag{5.4}$$

In the formula 5.4, k is the capitalization rate, RFR means risk-free rate, r is the risk premium rate, and g factor is a growth rate, whilst d is a depreciation rate. The model indicated in the formula 5.3 will perform correctly if the following three conditions occur: (i) a property market cycle not affected by upturn and downturn of the market, (ii) a property market with long contractual term preventing the owner

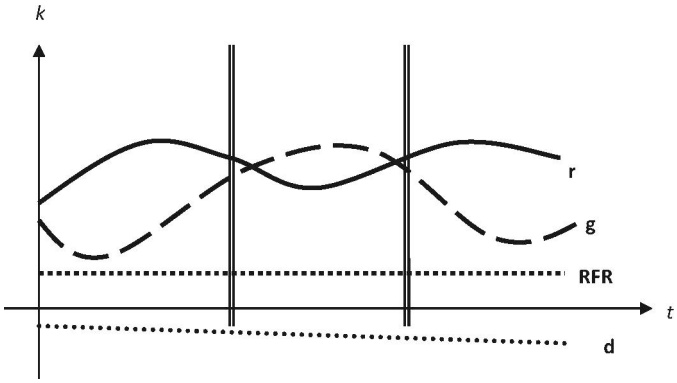


Fig. 5.3 Input variation because of the property market cycle. The Commonwealth terminology. (Own elaborations)

from meaningful variation in the property market cycle and (iii) a property market cycle in which the increase in the risk premium compensates the decrease in the growth factor. Property depreciation is not subject to market cycle and may be linked to the physical deterioration and functional and economic obsolescence. In the same way, modification of a risk-free rate can be assumed constant in the short term from a valuer point of view. On the other side, both r and g are factors that may be influenced by the property market cycle. The former term r is a remuneration for the risk in investing in a specific property market segment, whilst g factor is the rental growth. In the standard financial theory, risk premium can be normally divided into an asset class risk premium and an additional risk premium that may consider the specific differences between the asset risk to be valued and the risk profile of the entire asset class. The second term can be positive or negative and may be strongly influenced by the property market cycle. In fact, risk premium can be estimated using three alternatives: Capital Asset Pricing Model, weight average cost of capital or an intuitive approach (Baum & Crosby, 2008, p. 76). Although the models proposed are reliable and well accepted by the community of professional and academician, the information provided are normally related to the contingent situation at the date of valuation. In this analysis, there is not a linkage between the valuation results and the information on the property market trends. In the upturn phase of the market, the risk premium may diminish, whilst the growth factor may increase. The same terms may be influenced by a downturn phase of the market; in this case, the risk premium will increase, and the growth factor will decrease. In this case, both RFR or risk-free rate and depreciation rate may be assumed constant. Therefore, the formula may not perform adequately because of the cyclicality of inputs. In order to understand how the property market cycle affects the formula previously indicated, Fig. 5.3 shows how the terms of the formula 5.4 vary along the property market cycle.

Describing the relationship between k and time, it is possible to see in Fig. 5.3 that there are three different phases. The first one is a recession recovery rate whose growth factor is decreasing. At the same time, the risk premium tends to increase

because of the specific market phase. In the following phase of expansion contraction, we have a different behaviour. In this case, risk premium diminishes, and the growth factor increases. The interaction between the two forces incorporates the effect of the property market cycle in the valuation process of a property. Passing through the property market cycle phases, depreciation diminishes real estate process along the time. On the other side, risk-free rate is less sensitive to property market phases because it is more sensitive to macroeconomic forces. The change on risk-free rate may be registered in a medium term. As a result, there is a less intense wave that may be included in Fig. 5.1 as a straight line. According to Fig. 5.1, direct capitalization will be successful only if the movement of r and g factor may be compensated with the other terms. In fact, in this case, the k can be considered constant, and a long-term valuation may be addressed. This happens because the all risks yield is constant all over the time. Therefore, if in Fig. 5.1 the variations will not be compensated, the all risks yield will change over time, and consequently, it is possible to observe a meaningless valuation accuracy (Crosby, 2000). In US tradition, the formula 5.2 can be calculated in a different way. In this case, the overall capitalization rate is:

$$R_0 = Y - g \tag{5.5}$$

In the formula, R_0 is the overall capitalization rate. It is determined through the difference between the discount rate and the g factor. From a valuer perspective, the discount rate may not vary in a significant way along the time. On the other side, the g factor may include in this calculation all the future variations in terms of property value and property income. The g factor calculation is subjected to different "premises", it is possible to use several well-known "premises": the Inwood premise, Hoskold premise and Ring model. It will be easier to demonstrate that assuming both the approach to g factor determination means assuming a constantly yearly growth term. In the Inwood premise, the growth factor estimation of g is the product between the sinking fund factor and the total variation of the value along the holding period. Therefore, g factor can be calculated as follows:

$$g = \Delta a = \pm\Delta \frac{Y}{(1+Y)^n - 1} \tag{5.6}$$

The sinking fund factor is based on the discount rate which implies that a portion of the rent (say net operating income) could be reinvested at Y to replace investment. This is the reason why Y represents the return on capital (what is called in the Commonwealth terminology target rate of return) and the sinking fund factor represents the return of capital. The same formula may be addressed using the Hoskold premise. In this case, the overall capitalization rate will be calculated always as in the formula 5.6 using a speculative rate representing a fair rate of return on capital commensurate with the risks involved. This is the Y term and can be seen as the return on capital. In this case, the g factor is calculated in a different way as in the formula 5.7 below:

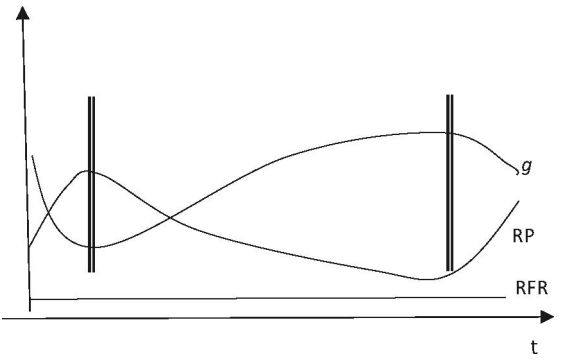


Fig. 5.4 Input variation because of the property market cycle. US terminology. (Own elaborations)

$$g = \Delta a = \pm\Delta \frac{Y_{sr}}{(1 + Y_{sr})^n - 1} \tag{5.7}$$

In order to calculate the return of the capital, it is considered another safe rate for the sinking fund designed to return all the invested capital to the investor in a lump sum at the termination of the investment to replace the asset at the end of the holding period (Appraisal Institute, 2012, p. 532). This is the only variation with the formula 5.6, and the safe rate is indicated in the formula 5.7 with the term Y_{sr}. The component of the discount rate can be considered similar to the Commonwealth approach as the sum between a risk-free and a risk premium. In the valuation process, the valuer considers the risk-free constant and the risk premium variable because of the cycle (d'Amato & Siniak, 2008; d'Amato et al., 2008; Kaklauskas et al., 2012). In the same way, the g factor may be sensitive to the property market cycle. In Fig. 5.4, it is possible to observe a possible relationship between overall capitalization rate and time:

As in Fig. 5.3, in a phase of expansion contraction, risk premium diminishes, and the growth factor increases. In a recession recovery phase, the growth factor decreases, whilst the risk premium increases. The interaction between the two forces incorporates the effect of the property market cycle in the valuation process of a property. On the other side, risk-free rate is less sensitive to property market phases because it is more sensitive to macroeconomic forces in the medium period. Even in the professional valuation practice in the USA, direct capitalization will be reliable if the movement of RP and g factor may be compensated with the other terms. In this way, the OAR overall capitalization rate will give the opportunity to reach a meaningful and a long-term value. The idea of a constant overall capitalization rate or a constant all risks yield may seem not realistic explaining the limits raised previously on the meaningful role of direct capitalization in the upturn and downturn of the market (DeLisle & Grissom, 2011).

Conclusions

In this chapter, the importance of the role of property market cycle in the valuation process is highlighted. In particular, it has been demonstrated how the input normally included both in the direct capitalization and in the determination of scrap value may be influenced by the upturn and downturn of the market cycle.

This is the reason why among the other causes of uncertainty, we find input availability. This concept should have in our view a double dimension. The former is the availability of information at the time of the valuation, and the latter is related to the information along time. The second temporal dimension is necessary to include the role of the property market cycle in the valuation process.

It seems evident that creating a stronger link between property market cycle information and property value may increase the accuracy of opinion of values giving a fundamental contribution to avoid procyclical valuation.

This is particularly true reading the effect of the global financial crisis of 2008 (d'Amato, 2015, 2017, 2018; Costantino et al., 2009). Moreover, because it is estimated that the current Covid-19 crisis makes a greater negative impacts on the real estate values, we may also cautiously speculate that real estate valuers should give more importance to the role of uncertainty and cyclicality on the real estate value. For this reason, it is necessary the exploration of tools (d'Amato, 2018; d'Amato et al., 2008) and strategy to include the dynamics and trends of property market cycle in the valuation process as previously requested since the contribution of Kazdin (1944). An important role may be played by the availability of time series of price and rent. In the next parts of this book, several proposals will be highlighted to address the point.

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Chapter 6
The Logic of a Cyclical Adjustment on Valuation: Some Reflexions



Paloma Taltavull de La Paz and Francisco Juárez Tárraga

Abstract During the global financial crisis, many voices in Europe rose up blaming a deficient valuation of properties that would have artificially increased prices, thus generating greater risk in the financial system by overvaluing mortgage collateral (French and Gabrielli, Pricingtomarket. J Prop Invest Finan 36(4),391–396, 2018). The result of this criticism was a strong pressure on appraisers to 'adjust' their valuations to the 'real' market value, when it was also known that, before the outbreak of the crisis, the interests of the agents were just the opposite. In both cases, it was left to the appraiser's ethical decision to fix the most probable value, compromising its credibility attached to the direction taken by the market. This anecdote, which has been repeated every time the real estate market has experienced a serious crisis (there are two previous crises that occurred in Europe since 1973 with similar claims), is an example of the difficulty of adjusting real estate values in periods of convulsion of their mechanisms, of the anchorage that valuation systems have to the evolution of market prices as well as of the distance from reality that they would have if they were only valued with technical systems. Therefore, in many regulations and valuation techniques recognized by institutions (IVS, RICS, TEGOVA and Appraisal Institute, among others), the recommendation is to perform calculations with more than one technique. On the other hand, the reaction to a fall in values is asymmetric with that which occurs when values increase excessively (appraisers seem to be penalized during falling prices periods but not when they grow), which shows a certain tendency to prioritize business interests in what it should be an objective valuation of any property.

Key words Property market · Market trends · Property market cycle analysis

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Property Valuation and Market Cycle

The difficulty in adjusting the value comes from the variability in the evolution of real estate prices and the heterogeneity of the property itself. The first works on real estate cycles showed such complexity (Pyhrr et al., 1999) and tested the moment in which real estate valuation is key to avoid (or soften) the level of risk in the financial system and the property market investment. The greatest price corrections occur when economic conditions worsen to the point where the economic mechanisms cease to function, affecting the economy as a whole and resulting in a reversal of the expansionary cycle. The growing integration of economies has extended that risk globally, with a contagion effect to other regions of what have traditionally been domestic crises (as occurred in the global financial crisis of 2007).

The existence of cycles in the evolution of property prices, as well as the drastic corrections that occur in the long term, is now a fact already evidenced by the available statistical information. As shown in Fig. 6.1, the Dallas FED and BIS data on housing prices show cycles evidenced in most markets which contains drastic corrections. Curiously, and contrary to what is thought (and has been said above that real estate crises are local), price corrections seem to appear synchronous or slightly delayed in most countries (which would lead to a common global cycle in the housing market not only today – Igan & Loungani, 2012 – but since the 1960s), and there have been at least four in the last 50 years (1973–1974, 1980–1981, 1989–1991 and 2007–2010) with some countries, such as the United Kingdom,

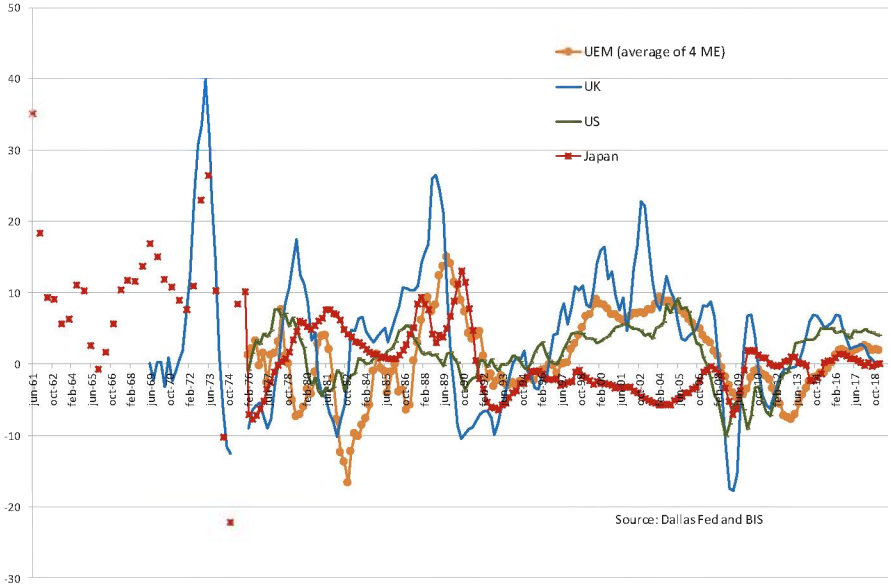


Fig. 6.1 Real housing price change in selected countries (y-to-y %)

with greater volatility in the evolution of their residential prices (and multiple minor corrections) while others (Germany or Japan) with milder price evolution.

Since there is evidence that there are cycles in real estate prices with long duration and ending in a strong correction, the fundamental question is whether or not real estate valuation conventional techniques should adapt their methods to this cyclical evolution adjusting the observed values, as some regulations claim to do, or they should refer what happens in the market in the short term, reflecting its tensions and letting the corrections depending on the purposes for which the valuation is used. Empirical evidence has shown the great relationship between real estate values and financial risk, as well as between house prices and inflation (Bernanke & Gertler, 1995; Mishkin, 2007), which has generated the concern about the evidence that the property values implications go beyond the scope of the real estate market, affecting global risk, having to be considered a matter of macroprudential scope and, therefore, subject to regulation at the macroeconomic level (as in the sequentially Basel II, III and IV regulations).

But the point is whether the inclusion of new methods that adjust valuations by economic cycle cannot lead to greater errors. Most of the shocks experienced by the prices seen in Fig. 6.1 were not advanced by analysts (the surprise at the time of the fracture in growth is one of the particularities of property market) and neither the apparently obvious transmission to other markets, so that it is not clear whether a calculation that corrects the appraisal values according to a forecasted cycle (trying to adjust for a potential bubble) could generate less biased appraisals than those obtained by conventional techniques. Besides, the doubt about that resulting values scores after correcting by cycle could be artificially far from the market values is also a key issue.

Introducing cyclical correction would require to have good cycle forecast estimation or 'convince' professional valuers to make a future prediction of prices, a complex task which could prove impossible to perform at the individual level or for an appraisal society.

This is, without a doubt, one of the main challenges facing the discipline of valuation: capturing value in changing environments of an asset whose main characteristic is heterogeneity, in a market subjected to cycles commonly delayed with the business cycle. Moreover, due to this heterogeneity, there are regions and periods in which market failures prevent the availability of sufficient information to approximate a sensible value (Adams & Tolson, 2019) and that to identify whether or not there are real estate 'bubbles' or rather prices reflect the evolution of their fundamental factors is not that easy (Asal, 2019, Quigley & Hwang, 2006).

The existence and recurrence of cycles in the real estate market have been widely studied in the literature (Pyhrr et al., 1999; Wheaton, 1999; Quigley, 1999; RICS, 1994), and the works agree that they can cause very relevant distortions in the valuations carried out. Pyhrr et al. (1996) argue that valuation theorists and appraisers have historically ignored, for various reasons, the effect of real estate cycles on their valuation tools and models. Born and Pyhrr (1994) conclude, as a result of the study of the real estate market in Houston, Texas, that the impact of the cycles is significant and can dramatically alter the valuations made especially at the

extremes (valleys and peaks) of the real estate supply/demand cycles. Wolff (2010) agrees and points out the importance of having databases to be able to adjust the appraisal value over time and throughout the cycle. The bottom line is how the current valuation captures the processes of price and/or return volatility. One of the fundamental techniques, the comparison method, inserts the market values at each moment in the technical valuation before the value is adjusted by characteristics, thus dragging the 'economic moment' to the real estate valuations. This isn't bad in itself. DeLisle and Grissom (2011) show that traditional valuation techniques are effective in periods of property market stabilization and even in periods of growth, but cease to be effective when price cycles are reversed. The income method is also affected by cyclical developments (d'Amato, 2015) by indefinitely projecting the initial valuation assumptions. Similarly, Phyrr et al. (1999) state that the method of rent capitalization tends to overvalue real estate assets when demand exceeds supply and markets are close to the top and tends to undervalue them in the opposite case. The market (quasi-) equilibrium is key for a correct valuation process, and investors require stable valuation to better take their decision to invest. The aftermath of the COVID-19 crisis will deal with an increase on volatility which will affect valuations worldwide. The increased uncertainty about the near future not only would have a short-term effect but also could stay longer introducing persistent bias to the estimated values from the comparable method. It is broadly accepted that uncertainty about how market can recover after COVID-19 would cause market players to follow a 'wait and see' policy (Baldwin & Weder, 2020: 15–16) and delay their economic decisions. However, as the recovery will take place sequentially country by country, uncertainty would potentially change investor expectations for the future, loss of confidence, with the effect of increased volatility lasting for longer (Cechetti et al., 2020) and with consequent effects on investment decision-making. Valuations will, then, become more volatile which would add to the uncertain investment. Summarizing, the appraisal process tends to constantly overvalue and undervalue property at or near the extremes of the real estate cycle (with varying bias degrees) because traditional methodologies do not include an analytical structure that correctly identifies or links cyclical factors affecting rents, expenditures and capitalization rates (Pyhrr et al., 1999). Maybe, it is the reason (although also the effect of property heterogeneity) why the appraisal method admits normal error rates of 10% around the final estimated value (McGreal & Taltavull, 2012). it seems clear that there is a strong need to adapt valuation systems to the cyclical evolution of property prices as well as that this effort requires of a strong methodological component that provides maximum objectivity to the process. d'Amato's works stand out as one of the few that try to approximate this phenomenon to valuation methods (d'Amato, 2015; Constantino et al., 2009; d'Amato, 2017; d'Amato et al., 2019). This book has been designed in this sense, and especially the second part deals with issues relevant to determining and explaining how property cycles affect valuation, for both subsequent regulation[1] for their effects (mainly fiscal) and market conditions. It also proposes the inclusion of cyclical variables in valuation systems

[1]However, for real estate appraisals, regulation does not seem typical. Instead, rule-making is essentially based on the activities of global (RICS)/regional (TEGOVA, App. Institute) SROs.

and related methodologies, particularly hedonic methods which would allow for quality-adjusted appraisals. The following years will show a challenge for real estate valuation as the market will require to be accurate in a framework with increasing volatility. The capacity to set robust techniques and methods to produce trustable and stable values is a strong requirement from the post-COVID-19 real estate markets. The interest that these aspects have is very great. This book opens a new horizon for thinking about and developing valuation methods that adapt property appraisals to market reality.

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Chapter 7
Property Market Cycle, Commercial Properties and Mortgage Lending Value



Maurizio d'Amato

Abstract Property valuation of income-producing properties is normally referred to as a direct relationship between value and income. This is normally defined as income approach. The valuation process may become unclear because of the upturn and downturn in the market. This problem has been addressed in the last International Valuation Standards introducing the definition of cyclical asset to calculate the exit value (IVS, 2020; IVS 105 para 50.21 lett e). In this paragraph, the calculation of terminal value is specified "for cyclical assets, the terminal value should consider the cyclical nature of the asset and should not be performed in a way that assumes peak or tough levels of cash flows in perpetuity". This paragraph excludes the application of all the most important current methodologies based on income approach. The problem raised for the determination of terminal value may be extended, generally speaking to income-producing properties. The chapter proposes an application of a valuation methodology previously introduced (d'Amato, Int J Strategic Property Manag 19(3):207–219, 2015; Cyclical capitalization. In Lorenz D, Dent P, Kauko T (eds) Value in a changing built environment. Wiley, 2017a; J Eur Real Estate Res 10(2):211–238, 2017b) defined cyclical capitalization as a method to estimate mortgage lending value for income-producing properties. The proposed model creates a bridge between the valuation process and the property market cycle for mortgage lending valuation. Cyclical capitalization is introduced together with a different approach to mortgage lending value. Although it is widely accepted the cyclical behaviour (Roulac et al. J Real Estate Portfolio Manag 2(1):1–17, 1996; J Real Estate Res, 1999; Pyhrr et al. Analyzing real estate asset performance during periods of market disequilibrium under cyclical economic conditions: a framework for analysis. In Kapplin SD, Schwartz Jr AL (eds) Research in real estate, vol 3, pp 75–106. JAI Press, 1990) of the property market in general and the commercial property market in particular, professional practice in property valuation still relies on capitalization of either a constant or a constant growing rent. This would be a serious problem particularly in the recessive period of the market (De Lisle and Grissom, J Property Invest Finance 29(4/5):384–427, 2011). Beside

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theoretical discussion and empirical evidence in the literature, consequence of the Covid-19 period also demonstrates that a constant market rent and hence mortgage lending value assumption are also misleading in practice.

Keywords Real estate market cycle · Cyclical capitalization · Mortgage lending value

Introduction

The global financial crisis (GFC) shed lights on the strategic role of the valuation of real estate for mortgage lending purposes. This crisis was originated in the subprime mortgage lending market of the USA. Several contributions highlighted the consequences of this important crisis for the stability of the economic system. The effect of GFC was investigated on the capital structure of company belonging to the European Public Real Estate Association (EPRA)/National Association Real Estate Investment Trust (NAREIT) Europe Index has (Morri & Artegiani, 2015) showing the increase of levered structure since the beginning of the crisis. The capital structure became more and more levered since the beginning of the crisis. A professional warn was launched in a well-known book on this crisis (Bitner, 2008). A specific role of the valuation process was played by the property market cycle. Real estate market cycle influence is more and more recognized and analysed by academicians and professionals. The International Valuation Standards introduced the definition of cyclical asset as an autonomous and specific group of properties to be appraised. Neither professional documents nor academic debate does not introduce a specific definition of such kind of asset even if it may be assumed as an asset strongly influenced by the property market cycle. This chapter explores the relationship between property market cycle and professional valuation of mortgage lending value of income-producing properties (d'Amato, 2015, 2017a, b; d'Amato & Amoruso, 2018) using more than one all risks yield rate in order to create and integrate between the valuation process and the real estate market cycle analysis. This chapter is structured in the following way. The following section is dedicated to literature review on the basis of value of mortgage lending value and its relationship with property market cycle. Following section presents a brief methodological introduction to cyclical capitalization, whilst next section proposes an application of the proposed solutions to London office market. Finally conclusions and future directions of research are presented.

Mortgage Lending Value and Property Market Cycle

Property market cycles have been analysed from different points of views. A first group of contributions is mainly focused on the different kinds and temporal lengths of property market cycles. For example, Kuznets (1930) described swings with a

medium range of 15–25 years mainly related to the immigration and the construction activity. In the same group of contributions, Hoyt (1933) observed land market in Chicago in the temporal interval between 1830 and 1933 discovering the interaction of different cyclical phenomenon as population growth, rent levels, operating costs of building and land prices. The relationship among the value of new constructions, rents and vacancies and the changes in interest rates. Six residential and four non-residential construction cycles are detected in the USA in the interval between 1950 and 1978. Grebler and Burns (1982) observed six residential and four non-residential construction cycles in the USA between 1950 and 1978. Hekman (1985) observed the cyclicality of office sector in 14 cities in a period starting from 1979 to 1983. Roulac (1996) highlighted the cyclical nature of real estate markets and how they are influenced by the general economy, office demand, office construction, property values, volume of transactions, capital for real estate, investor interest and tax climate factors. In general terms, real estate is connected to different kinds of economic cycles but is volatile, especially in the periods of speculation (Reed & Wu, 2010; Barras, 2009; Witkiewicz, 2002; Wheaton, 1999). Dokko et al. (1991) observed as market conditions at local level and macroeconomic conditions jointly move creating cyclical outcomes in the local real estate market. Case and Shiller (1989), Borio et al. (1994), and Renaud (1995) observed how real estate prices are cyclical. The role of speculation in real estate cycles has been analysed by Malpezzi and Watcher (2005). They arrived at the conclusion that the land speculation is the fundamental cause of property market cycles. Pritchett (1984) proposed vacancy rate as the best indicator of the cycle. Analysing 17 US metropolitan areas, Voith and Crone (1988) demonstrated the cyclicality of the vacancy rate. Temporal length of the cycle is a recurring problem in property market cycle articles. A possible classification can define different kinds of property market cycle. Three to five years can be defined as kitchen cycle; a 7- to 11-year major cycle normally connected with fixed investments is normally defined as Juglar cycle. A further swing mainly caused by population change and infrastructure investment is normally called Kuznets cycle with a temporal length from 15 to 25 years. Finally, a 45- to 50-year-long wave is normally associated with major innovations, and it is defined as Kondratiev cycle (Grover & Grover, 2013; Barras, 2009). Clayton (1996) demonstrated the predictability of major market cycles. Roulac (1996) in a rigorous qualitative study listed the factors influencing real estate markets as, among others, general economic conditions, office demand, office construction, property values and volume of transactions. Soderberg (1999) explored the relationship between the property market cycles and the speculative bubbles in the 1980s. Capital value and rent were used to demonstrate the lack of bubbles in the office and retail property market in the UK (Wang, 2000). Furthermore, property market swings more severely than the swings in economy as a whole (Wang, 2003). Mueller and Laposa (1994) explored rent distribution in several real estate market phases. Dobberstein (2000) showed the pro-cyclical behaviour of the actors of project developers, financiers, investors, consultants and cities in the German office market.

A different group of scientific contributions are focused on the relationship between property market cycle and property valuation and investment. One of the

most important contributions in this field has been provided by Kazdin (1944). He stressed for the first time the importance to include property market cycle in the overall cap rate determination. Pyhrr et al. (1990) provided an important analysis of the relationship between market cycles in real estate market analysis. Roulac et al. (1999) addressed the importance of the market cycle for investment and portfolio management. Dokko et al. (1999) proposed a property cycle model founded on the linkage between property value and net operating income invoking "...a theory of real estate cycles that demonstrates the interrelationships among the economic cycle, real estate rental rates and property value cycles over time...". A proposed integration between real estate market cycle and real estate management process is provided by Rottke et al. (2003). The first actual attempt to create a bridge between property valuation and property market cycle is the fundamental contribution of Born and Pyhrr (1994) defining the traditional valuation techniques based on income approach as "...a static modelling that is incompatible with the dynamic market it seeks to measure..." (Born and Pyhrr 1994, p. 456).

Basis of Value

The relationship between property market cycle analysis and property valuation has been also highlighted even in the professional documents. In the academic literature of the concept of property market cycle is often neglected in the definition of the basis of value mortgage lending value (Renigier-Bilozor & d'Amato, 2017; Renigier-Bilozor et al., 2018, 2019), bases of value are the fundamental assumptions for assessing a valuation for a defined purpose. The main bases of value, alternative to the most important one or market value, are indicated in Table 7.1.

Among others, it is possible to observe the mortgage lending value. Normally, this basis of value is adopted by for the prudent assessment of a property as a collateral for a lending process. The importance of this basis of value has been highlighted by several documents. For example, the EU Directive 2014/17/EU requires "It is important to ensure that the residential immovable property is appropriately valued before the conclusion of the credit agreement and, in particular where the valuation affects the residual obligation of the consumer in the event of default. Member States should therefore ensure that reliable valuation standards are in place. In order to be considered reliable, valuation standards should take into account internationally recognised valuation standards, in particular those developed by the International Valuation Standards Committee, the European Group of Valuers' Associations or the Royal Institution of Chartered Surveyors". Obviously, this is true also for income-producing properties.

There have been several attempts to define mortgage lending value as a different basis of value, although there are several countries that do not have even a specific definition of such basis of value. A lack of contribution on understanding the mortgage lending value has been highlighted (Bienert & Brunauer, 2007). Even the European Banking Authority on mortgage lending value (05/10/2015 page 6)

Table 7.1 Main basis of value according to European Valuation Standards 2020

Fair value	Fair Value may generally be used as a basis of valuation for real estate as between specific, identified participants in an actual or potential transaction, rather than assuming the wider market place of possible bidders. As such, it may often result in a different value to the Market Value of a property. (EVS, 2020; EVS2 para 4.1)
Fair rent	The same concept can be applied to the determination of a Fair Rent between two specific, identified parties. In this context Fair Rent is defined as: "The rent that would be received on the letting of a property in an orderly rental transaction between identified willing market participants possessing full knowledge of all the relevant facts, making their decision in accordance with their respective objectives". (EVS, 2016; EVS2 para 4.1
Fair value for accounting purposes	"The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (International Accounting Standards Board (IASB), International Financial Reporting Standards (IFRS) 13, par. 1; EVS, 2020 EVS2 Valuation Bases Other than Market Value)
Special value	Special Value is defined as an opinion of value that incorporates consideration of characteristics that have a particular value to a Special Purchaser. (EVS, 2020; EVS2 Valuation Other than Market Value para 5.1)
Synergistic value	It is a higher value, created when the total value of several properties (or of several legal interests in the same property) combined is greater that the value of the sum of their parts. (EVS, 2020; EVS2 para 5.3.2)
Investment value	This Special Value is the value of a property to a particular identified party. (EVS, 2016.; EVS2 para 6.1.1)
Mortgage lending value	The value of immovable property as determined by a prudent assessment of the future marketability of the property taking into account long-term sustainable aspects of the property, the normal and local market conditions, the current use and alternative appropriate uses of the property. (EVS, 2020; EVS2 para 7.1)
Insurable value	Insurable value is the cost of replacing the damaged property with materials of like kind and quality without any deduction for depreciation. (EVS, 2020; EVS2 para 8.1.1)
Value for local and national taxation purposes	In many countries real estate assets are used as a basis for raising local or national taxes. Taxes can be levied on one-off events (such as sales or purchases of the property, or on death of the owner) or can be levied on a recurring basis, typically annually. As the basis of value to be adopted for taxation purposes will generally be defined in the relevant national or local legislation or regulations, it is inappropriate to go into further details in this EVS (EVS, 2020; EVS2 para 9)
Value for compensation	Where national or local government bodies acquire property compulsorily in order to carry out public interest schemes it is usual for the owner (and the occupiers, if any) to receive appropriate compensation payments. While compensation for loss of property is often based on Market Value, this principle may be modified by national or local law and legal precedent. As such, it is inappropriate to seek to treat this subject further in this EVS (EVS, 2020; EVS2 para 10)

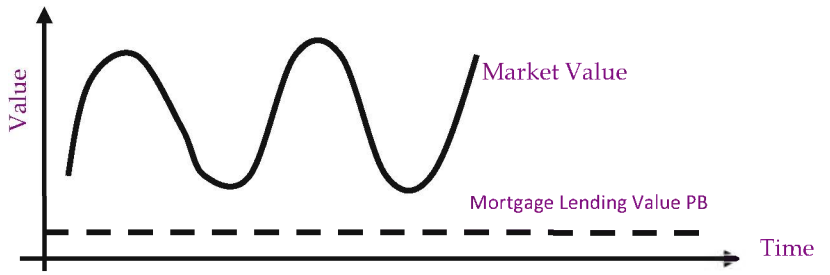


Fig. 7.1 Mortgage lending value and market value Pfandbrief Act. (Bienert & Brunauer, 2007)

requested more clarity in the procedural aspects of mortgage lending value. The European Banking Authority (EBA) offered a uniform definition of mortgage lending value. For this reason, the Capital Requirements Regulation (EU) No. 575/2013, art. 4 (74), defines the mortgage lending value as "... the value of immovable property as determined by a prudent assessment of the future marketability of the property taking into account the long-term sustainable aspects of the property, the normal and local market conditions, the current and alternative appropriate uses of the property". The purpose of the MLV is "to provide a long-term, sustainable value as a stable basis for judging the suitability of a property as a security for a mortgage which will continue through potential market fluctuations" (European Banking Authority, 2015). The European Mortgage Federation and the Basel Committee stress the importance of information about the risks of properties to be loaned on (Lambert & Johnson, 2003). One of the most important definitions of MLV is in the Hypothekenbankgesetz (HBG in Austria) and the new PfandBG (Germany). They can be considered the way to follow the requirements of the BelWertV (Germany). They can be considered compulsory for banks who want to issue covered bonds (Pfandbriefe section 1 I S.1 PfandBG). The definitions and methods have been applied in an extensive way to other banking sectors. It is possible to compare graphically the definition of mortgage lending value according to Pfandbrief Act with market value as indicated in the graphic below (Bienert & Brunauer, 2007):

As one can see in Fig. 7.1, there is a market value whose values are cyclical with upturn and downturn of the market. At the bottom, it is possible to observe a straight line that should represent the mortgage lending value. Mortgage lending value may be seen as a value that can be defined not dependent on peaks and the troughs of the property market cycle (Quentin, 2009). According to this definition, there should be a unique value along the time, and consequently, the bank should lend the amount of money on a percentage basis calculated on an amount indifferently if their clients are living a real estate market crisis or an impressive expansion phase.

A Different Approach to Mortgage Lending Value

We believe that the representation in Fig. 7.1 is neither realistic nor useful for the decision-making in economic systems and for the banking system, too. It does not represent the true meaning of banking activity that is often sharing the risk with their client. The term Bank is originated by Italian "Banca" indicating a specific place where two or more persons may be sitting together. It is not the case of this "brave" definition of mortgage lending value. The valuer should take into account "long-term sustainable aspects" in an imperfect market where it is often not easy to get the necessary information for the present. There is a need of methodological tools that may allow the valuer to deal with the long term without forgetting the strategic role of the bank in the upturn and downturn of the market. These methodological tools should not shift the responsibility of a banker on the shoulder of the property valuers who could not define an unrealistic definition of value transforming himself from valuer to risk analyst. There is no need to say that each valuation is based on assumptions and data. It is very difficult to imagine information having the situation indicated in the previous graphic without the influence of speculative components. The principal criticism to this definition is the impossibility of collecting realistic information that should not be influenced by the upturn and downturn of the market, especially for commercial real estate. A rent and a yield rate are both continuously influenced by the real estate market dynamics. In other words, "... A simplistic understanding of value would therefore suggest that the figure provided should be a figure which has a life for the length of the loan. However this very concept is impossible in any market with volatility. Values can only be snapshots in time. They do not have shelf life..." (Crosby et al., 2000, p. 80). A review of the methodological problems in the valuation process for mortgage lending value determination in the residential real estate market is provided by Wang et al. (1998). Criticism on the Valuation Framework of German Banks has been proposed by Crosby et al. (1998). Several contributions have been provided in this field (i.e. see Ross et al., 2005; Sommer & Kroll, 2005; Rossler & Langner, 2004). There have been several methodological proposals to deal with the problem of determination of mortgage lending value. The Long-Term Value Working Group (2017) offered three different methodologies: an algorithm to determine the adjusted market value in the application of market approach, the determination of an appropriate "prudent" cap rate and rent in order to reach a "prudent valuation" and finally the calculation of a prudent assessment of cap rate (all risks yield) in the determination of investment value. In German and Austrian practice, there are two different ways to derive MLV. The former is a calculation of an independent specific value and the latter as a percentage of discount on the market value. The use of a market value as a basis of the mortgage lending value depends on a risk profile of the property. The greater the property's risk of change in value, the higher the discount (see Fig. 7.3) (see Ruchardt, 2001, p. 22; Kullig & Walburg, 2003, p. 26). The discount may be calculated using Value at Risk approach (Bienert & Brunauer, 2007). An application of the Value at Risk (VaR) approach was done also for mortgage lending value determination (Tajani and

Morano 2018). Probably, it may be useful to recall some underlying assumptions of this model before applying it in a real estate market. VaR is a procedure derived from the financial market that have a huge quantity of data with a level of transparency much higher than the property market and a higher level of symmetry of information. It is based on a normal distribution of information that may not be verified, according to the fact that in a real estate market, information may be fewer than the financial one. The model deals with the systematic risk only. On the other side, the non-systematic risk is higher in the property market. These are only few critical points in the application of VaR as a method of determination of mortgage lending value (Bienert & Brunauer, 2007, p. 567). For this reason, we believe that a possible solution to the valuation of mortgage lending value should derive from the original methodological domain of income approach.

A Possible Solution: Cyclical Capitalization (Normal and Strong Form)

The rationale of cyclical capitalization consists in dividing a perpetuity in several different slices of value per each property market phase. Using a direct capitalization or a dividend discount model (explicit growth models) may provide two different ways to deal with such kind of income approach modelling. Assuming a definition of property market cycle, it is possible to define two different property market phases: the first one is a negative market phase called "recession recovery", whilst the second property market phase is called "expansion contraction". Including property market cycle in the valuation process allows the valuer to provide more than one overall capitalization rate according to US definition or yield rate according to the Commonwealth definition. The valuer will use more than one capitalization rate providing a forecast of the length of the property market cycle, too. In the simpler model (normal version) of cyclical capitalization, these phases have a constant length. The value of a property in the first phase (recession recovery) or the first "slice of value" will be defined as follows:

$$V_{\text{PhaseRR}} = \frac{\text{NOI}}{Y + g_{\text{RR}}} - \frac{\text{NOI}}{Y + g_{\text{RR}}} \frac{1}{(1+Y)^{t_{\text{RR}}}} \tag{7.1a}$$

$$V_{\text{PhaseRR}} = \frac{\text{NOI}}{R_{\text{RR}}} - \frac{\text{NOI}}{R_{\text{RR}}} \frac{1}{(1+Y)^{t_{\text{RR}}}} \tag{7.1b}$$

The formula 7.1a represents a first slice of value according to US terminology. NOI stands for net operating income, and it is the rent provided by the commercial property; Y is the discount rate, whilst g is the growth factor in the specific property market phase. The former formula applies the well-known Gordon-Shapiro model to value determination. In the formula 7.1b, R is the overall capitalization rate in the specific property market phase. In this case, the overall cap rate may be determined

using the comparables or time series in different property market phases in the specific property market segment. The term t indicates the temporal length of the phase. The same model can be presented using the Commonwealth terminology as in the formula 7.2:

$$V_{\text{PhaseRR}} = \frac{R}{r + g_{\text{RR}} + d} - \frac{R}{r + g_{\text{RR}} + d} \frac{1}{(1+r)^{t_{\text{RR}}}} \tag{7.2}$$

In the formula 7.2, R stands for market or current rent, and r is the target yield, whilst g is the growth factor and d is the depreciation rate yield in the specific property market phase recovery recession. This is a first slice of value according to the Commonwealth terminology. In the next part of the chapter, we will use this kind of terminology. A second slice of value is therefore added to the first one using both US (7.3a) and Commonwealth (7.3b) terminology completing a cycle:

$$V_{\text{MC}} = \frac{\text{NOI}}{Y + g_{\text{RR}}} - \frac{\text{NOI}}{Y + g_{\text{RR}}} \frac{1}{(1+r)^{t_{\text{RR}}}} + \frac{\text{NOI}}{Y - g_{\text{EC}}} \frac{1}{(1+r)^{t_{\text{RR}}}} - \frac{\text{NOI}}{Y - g_{\text{EC}}} \frac{1}{(1+r)^{t_{\text{EC}}+t_{\text{RR}}}} \tag{7.3a}$$

$$V_{\text{MC}} = \frac{R}{r + g_{\text{RR}} + d} \frac{1}{(1+r)^{t_{\text{RR}}}} + \frac{R}{r + g_{\text{EC}} + d} \frac{1}{(1+r)^{t_{\text{RR}}}} - \frac{R}{r + g_{\text{EC}} + d} \frac{1}{(1+r)^{t_{\text{EC}}+t_{\text{RR}}}} \tag{7.3b}$$

In the formula, V_{MC} means the property value of an entire market cycle; the other terms assume the same meaning we have seen previously. Considering a number n of phases and $t_{\text{RR}} = t_{\text{EC}} = t$, then, using Commonwealth terminology, we have:

$$V_{\text{MC}} = \frac{R}{r + g_{\text{RR}} + d} - \frac{R}{r + g_{\text{RR}} + d} \frac{1}{(1+r)^{t}} + \frac{R}{r + g_{\text{EC}} + d} \frac{1}{(1+r)^{t}} - \frac{R}{r + g_{\text{EC}} + d} \frac{1}{(1+r)^{2t}} \tag{7.4}$$

Assuming a t_{EC} equal to t_{RR} and a hypothetical life previously indicated formula can be also written as the formula 7.5:

$$
\begin{aligned}
V_{\mathrm{MC}} = & \frac{R}{r+g_{\mathrm{RR}}+d}\left[1-\frac{1}{(1+r)^{t}}+\frac{1}{(1+r)^{2t}}-\frac{1}{(1+r)^{3t}}\cdots\right] \\
& +\frac{R}{r-g_{\mathrm{EC}}+d}\left[\frac{1}{(1+r)^{t}}-\frac{1}{(1+r)^{2t}}+\frac{1}{(1+r)^{13t}}-\frac{1}{(1+r)^{4t}}\cdots\right] \\
V_{\mathrm{MC}} = & \frac{R_{\mathrm{RR}}}{y_{\mathrm{RR}}}\left[1-\frac{1}{(1+r)^{t}}+\frac{1}{(1+r)^{2tt}}-\frac{1}{(1+r)^{3t}}\cdots\right]+\frac{R_{\mathrm{EC}}}{y_{\mathrm{EC}}}\left[\frac{1}{(1+r)^{t}}\right. \\
& \left.-\frac{1}{(1+r)^{2t}}+\frac{1}{(1+r)^{3t}}-\frac{1}{(1+r)^{4t}}\cdots.\right]
\end{aligned}
\tag{7.5}
$$

In the formula 7.6, it is possible to observe two geometric progressions of rate $-1/(1+r)^{t}$. Therefore:

$$
\begin{aligned}
V_{\mathrm{MC}} = & \frac{R}{r+g_{\mathrm{RR}}+d}\left[1-\frac{1}{(1+r)^{t}}+\frac{1}{(1+r)^{2t}}-\frac{1}{(1+r)^{3t}}\cdots\right] \\
& +\frac{R}{r-g_{\mathrm{EC}}+d}\frac{1}{(1+r)^{t}}\left[1-\frac{1}{(1+r)^{2t}}+\frac{1}{(1+r)^{3t}}-\frac{1}{(1+r)^{4t}}\cdots\right] \\
V_{\mathrm{MC}} = & \frac{R_{\mathrm{RR}}}{y_{\mathrm{RR}}}\left[1-\frac{1}{(1+r)^{t}}+\frac{1}{(1+r)^{2t}}-\frac{1}{(1+r)^{3t}}\cdots\right] \\
& +\frac{R_{\mathrm{EC}}}{y_{\mathrm{EC}}}\frac{1}{(1+r)^{t}}\left[1-\frac{1}{(1+r)^{2t}}+\frac{1}{(1+r)^{3t}}-\frac{1}{(1+r)^{4t}}\cdots.\right]
\end{aligned}
\tag{7.6}
$$

Assuming the same discount rate both in the negative and in the positive property market phases, it is possible to write:

$$
\begin{aligned}
V_{\mathrm{MC}} = & \frac{R_{\mathrm{RR}}}{y_{\mathrm{RR}}}\left[1-\frac{1}{(1+r)^{t}}+\frac{1}{(1+r)^{2t}}-\frac{1}{(1+r)^{3t}}\cdots\right]+\frac{R_{\mathrm{EC}}}{y_{\mathrm{EC}}}\frac{1}{(1+r)^{t}} \\
& \times\left[1-\frac{1}{(1+r)^{2t}}+\frac{1}{(1+r)^{3t}}-\frac{1}{(1+r)^{4t}}\cdots.\right]
\end{aligned}
\tag{7.7}
$$

The second part of the formula is an infinitive geometric progression whose rate q is the following term:

$$q = -\frac{1}{(1+r)^t} \tag{7.8}$$

included in the interval $-1 < q < 1$. Therefore, the progressions will be calculated using the following Taylor polynomium as follows:

$$V_{MC} = \frac{R(1+r)^t}{(1+r)^t - 1}\left[\frac{1}{y_{RR}} + \frac{1}{y_{EC}}\frac{1}{(1+r)^t}\right] \tag{7.9}$$

This is the basic formula of cyclical capitalization (d'Amato, 2015, 2017a, 2017b; d'Amato et al., 2019a, b) even if this kind of procedures is a growing family of methods (d'Amato, 2017a). In this chapter, it is proposed a further variant of cyclical capitalization using different discount rates for different property market phases. In this case, we may have two different geometric progressions varying not only for the g factor but also for the discount rate referring to the Commonwealth terminology. Therefore, the formula becomes:

$$\begin{aligned} V_{MC} = & \frac{R}{r_{RR} + g_{RR} + d}\left[1 - \frac{1}{(1+r_{RR})^t} + \frac{1}{(1+r_{RR})^{2t}} - \frac{1}{(1+r_{RR})^{3t}} \cdots\right] \\ & + \frac{R}{r_{EC} - g_{EC} + d}\left[\frac{1}{(1+r_{EC})^t} - \frac{1}{(1+r_{EC})^{2t}} + \frac{1}{(1+r_{EC})^{3t}}\right. \\ & \left. - \frac{1}{(1+r_{EC})^{4t}} \cdots\right] \\ V_{MC} = & \frac{R}{y_{RR}}\left[1 - \frac{1}{(1+r_{RR})^t} + \frac{1}{(1+r_{RR})^{2t}} - \frac{1}{(1+r_{RR})^{3t}} \cdots\right] \\ & + \frac{R}{y_{EC}}\frac{1}{(1+r_{EC})^t}\left[1 - \frac{1}{(1+r_{EC})^t} - \frac{1}{(1+r_{EC})^{2t}} + \frac{1}{(1+r_{EC})^{3t}}\right. \\ & \left. - \frac{1}{(1+r_{EC})^{4t}} \cdots\right] \end{aligned} \tag{7.10}$$

In this way, the model previously indicated is modified as follows:

$$V_{MC} = R\left[\frac{1}{y_{RR}}\frac{(1+r_{RR})^t}{(1+r_{RR})^t + 1} + \frac{1}{y_{EC}}\frac{1}{(1+r_{EC})^t + 1}\right] \tag{7.11}$$

This version of the cyclical capitalization model may be useful in those contexts with meaningful differences in the different phases. In the following paragraph, a possible application of these models for the determination of mortgage lending value will be proposed. For this reason, these models can be defined as cyclical

Table 7.2 Different forms of cyclical capitalization

Normal form	Strong form
$V_{MC} = \frac{R(1+r)^t}{(1+r)^t-1}\left[\frac{1}{y_{RR}} + \frac{1}{y_{EC}}\frac{1}{(1+r)^t}\right]$	$V_{MC} = R\left[\frac{1}{y_{RR}}\frac{(1+r_{RR})^t}{(1+r_{RR})^t+1} + \frac{1}{y_{EC}}\frac{1}{(1+r_{EC})^t+1}\right]$

capitalization in its strong form. The comparison between the two different versions is indicated in Table 7.2.

An Application

In the following paragraph will be tested both the versions (normal and strong) of the cyclical capitalization process. No lag vacancy will be introduced in the model (d'Amato, 2017b). The determination of the inputs can be based also using stochastic modelling and may be based on intervals. It is also possible to provide the Monte Carlo simulation of these inputs. The application of the normal version of the model will follow US terminology and standards, whilst the strong form of the cyclical capitalization will be referred to the Commonwealth terminology. An application of these models is provided based on information of CB Richard Ellis London. They will be tested on a database on prime rent in the office sector in the urban area "City" of London in the UK. The time series starts from the third quarter of 1972 to the end of the first quarter of 2008. Information are appraisal based and referred to as freehold properties high qualities office units having a standard size of 1000 sqm in a prime location in the office market. Figure 7.2 presents the time series of the rate of change observed in the "backward holding period" (d'Amato, 2015) of 10 years in which it is possible to recognize a complete cycle with two phases of recovery recession and expansion contraction.

The rate of changes of prime rent (Lee et al., 2014) has been calculated as in the formula 7.12 below:

$$vr = \frac{R_t - R_{t-1}}{R_{t-1}} \tag{7.12}$$

According to US approach to one approach to direct capitalization (Gordon Shapiro, 1956), overall capitalization rate will be calculated as in the formula 7.14 below:

$$\begin{aligned} R &= Y - g \\ R &= Y - \Delta a \end{aligned} \tag{7.13}$$

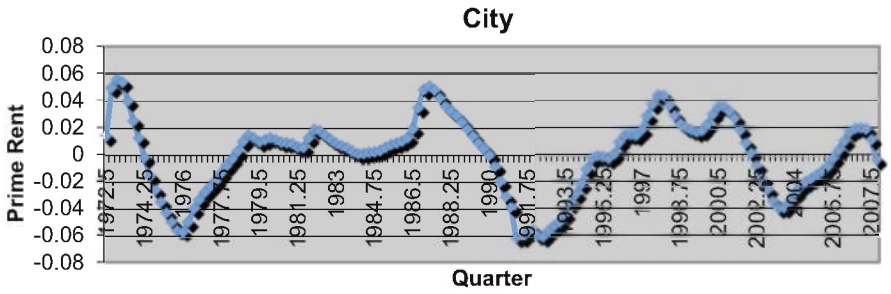


Fig. 7.2 Rate of changes of office prime rents in the office market of South Bank area in London

The growth factor is a product between two parts (Inwood premise). The former is the total relative change in property and value (The Appraisal of Real Estate, 13th Edition, p. 532), whilst the second component is the annual sinking fund factor or annual recapture rate to convert the total change in a "periodic rate of change" (The Appraisal of Real Estate, 13th Edition, p. 532). Here can be understood the difference between the traditional approach and the cyclical capitalization. In the former case, the total change is related to the entire life of the property. In cyclical capitalization, the total change is related to the specific property market phase like in the formula 7.14.

$$\Delta a = \Delta \frac{Y}{(1+Y)^n - 1} \tag{7.14}$$

An autoregressive model has been applied on time series of prime rents in the City area of London in order to plot the property market cycle. Table 7.3 indicates rates of change of two market phases in the backward holding period and the general temporal length of each market phase: 4 years.

In Table 7.4, it is indicated both the trimestral and the annual rate of change.

The annual rate of change is estimated on a weighted average of the different phase observed and analysed; therefore, the final results will be indicated in Table 7.5.

The variability of the opinion of value can be observed considering: a net operating income equal to 1 and the discount rate Y varying between a minimum of 0.04 and a maximum of 0.19. The overall capitalization rate in the recovery recession will vary according to the variation of discount rate. Starting from the formulas 7.13 and 7.14, it will be possible to define two different overall capitalization rates instead of one in Table 7.5.

In Table 7.5, it is possible to observe the second column having the discount rate varying from 0.04 to 0.19. The third column indicates the rate of changes in two different market phases and the number of years of each property market phase. In the fourth column, there is the sinking fund factor calculated as in the formula 7.14. From the fifth to eighth columns of table 7.6, it is possible to observe the calculation of g factors in two different property market phases recession recovery and expansion contraction. In addition, there is also the calculation of two different overall capitalization rates per each market phase. Finally, in Table 7.6, it is possible to see a

Table 7.3 Number of quarters per each market phase and temporal length of the office property market cycle in city of London area

Temporal length in quarter of the phase in the backward holding period City of London Office Market				
Ist phase	IInd phase	IIIrd phase	Arithmetic Mean	t
EC	RR	EC		
12	13	15	13.3	4

Table 7.4 Trimestral and annual rate of change per each market phase of the office property market cycle in city area in London

CL office market	Ist phase	IInd phase	IIIrd phase
	Expansion Contraction	Recovery Recession	Expansion Contraction
	+	−	+
Mean (quarterly)	0.0235975	−0.028159231	0.017602667
Stand. Dev (quaterly)	0.020627819	0.022998816	0.025771226
Mean (annual)	**0.097783922**	**−0.107967955**	**0.072291703**

Table 7.5 Annual rate of change per market phase of the office property market cycle in city area in London

	EC	RR
Annual rate of change	0,085037813	−0,107967955

comparison among the results of the valuation model. In the second column, there is the discount rate; in the third and fourth columns are indicated the different overall capitalization rates per each market phase. In the fifth column, there is the temporal length of the market phase. The sixth column indicates the value obtained by the application of cyclical capitalization. In the seventh and eighth columns, it is possible to observe the values that it would be obtained applying the direct capitalization model based on the information available in the specific market phase (expansion contraction and recovery recession). The final two columns provide the rate of change. It is evident that in each phase, the valuation is higher in the recovery recession phase and lower in the expansion contraction providing a value that can deal with the property market cycle in a more efficient way a sort of mean of value that provide a factual meaning to the term mortgage lending value (Table 7.7).

Table 7.6 showed the normal form of cyclical capitalization. It is worth to notice that it is possible to include in this model also lag vacancy and the role of contractual length (d'Amato et al., 2019a, b; d'Amato, 2017b). This is the normal form according to US terminology. According to the Commonwealth terminology, the all risks yield is calculated as follows:

$$y = \mathrm{RFR} + \mathrm{RP} + g - d \tag{7.15}$$

Table 7.6 Calculation of overall capitalization rate recession recovery and expansion contraction in the office property market cycle City area in London

	OFFICE MARKET AREA CL CALCULATION OF R_{RR} and R_{EC}						
	Y	Rate of Change Δ RR	Sinking Fund Factor a	Δa_{RR}	R_{RR}	Δa_{EC}	R_{EC}
1	0.04	−0.107967955	0.255490045	−0.02543	0.06543	0.020026	0.019974
2	0.05	Rate of Change Δ EC	0.232011832603463	−0,02504	*0,07504*	0,01972	*0,03027*
3	0.06	0.085037813	0.228591492373273	−0,02468	*0,08468*	0,01943	*0,04056*
4	0.07	t (years)	0.225228116667264	−0,02431	*0,09431*	0,01915	*0,05084*
5	0.08	4	0.221920804454039	−0,02396	*0,10396*	0,01887	*0,06112*
6	0.09		0.218668662091098	−0,02360	*0,11360*	0,0185	*0,07140*
1	0.1		0.215470803706098	−0,02326	*0,12326*	0,01832	*0,08167*
2	0.11		0.212326351547466	−0,02292	*0,13292*	0,01805	*0,09194*
3	0.12		0.20923443630569	−0,02259	*0,14259*	0,01779	*0,10220*
4	0.13		0.206194197406613	−0,02226	*0,15226*	0,01753	*0,11246*
5	0.14		0.203204783278034	−0,02193	*0,16193*	0,01728	*0,12271*
6	0.15		0.200265351590858	−0,02162	*0,17162*	0,01703	*0,13296*
7	0.16		0.197375069476025	−0,02131	*0,18131*	0,01678	*0,14321*
8	0.17		0.194533113718417	−0,02100	*0,19100*	0,01654	*0,15345*
9	0.18		0.19173867092889	−0,02070	*0,20070*	0,01630	*0,16369*
10	0.19		0.188990937695547	−0,02040	*0,21040*	0,01607	*0,17392*

Table 7.7 Valuation variation between the direct capitalization of cyclical capitalization with the direct capitalization using the cap rate of each phase

AREA CL VALUE DETERMINATION									
	Y	Rrr	Rec	t	V-CC	V-RR	V-EC	Rate of Change RR	Rate of Change EC
1	0.04	0.06542537	0.01997444	4	31.31300	15.28458	50.06397	−0,5118772	0.5988239
2	0.05	0.07504984	0.03027022		22.22144	13.32447	33.03576	−0,4003775	0.4866614
3	0.06	0.08468055	0.0405610		17.48653	11.8090	24.65417	−0,3246753	0.4098951
4	0.07	0.09431741	0.05084709		14.52508	10.60249	19.66680	−0,2700563	0.3539888
5	0.08	0.1039603	0.06112834		12.47438	9.619053	16.35902	−0,2288953	0.3114096
6	0.09	0.1136092	0.07140489		10.95941	8.80210	14.00464	−0,19684567	0.2778637
1	0.1	0.1232639	0.08167683		9.78902	8.112672	12.2433	−0,1712481	0.2507244
2	0.11	0.1329244	0.09194423		8.854680	7.523070	10.87615	−0,1503848	0.2282947
3	0.12	0.1425906	0.1022071		8.089806	7.013084	9.784050	−0,1330961	0.2094294
4	0.13	0.1522623	0.1124656		7.451097	6.567611	8.891600	−0,1185713	0.1933274
5	0.14	0.1619396	0.1227199		6.909066	6.175141	8.148637	−0,1062263	0.1794121
6	0.15	0.1716222	0.1329698		6.442882	5.826750	7.520500	−0,0956298	0.16725716
7	0.16	0.1813101	0.1432156		6.037379	5.515410	6.982476	−0,0864562	0.156541
8	0.17	0.1910033	0.153457		5.681233	5.235510	6.516469	−0,0784553	0.147016
9	0.18	0.2007016	0.1636949		5.365810	4.982520	6.108923	−0,0714318	0.1384904
10	0.19	0.2104049	0.1739286		5.084397	4.752739	5.749484	−0,0652305	0.1308094

Table 7.8 Cyclical capitalization determination of overall capitalization rate (recovery recession) assuming a temporal length of the market phase indicated in the Table 7.3

	RECESSION RECOVERY PHASE CL area				
	Risk free	Risk premium	Rate of change	Depreciation rate	$cARY_{RR}$
1	0.06	0.08	−0.107967955	0.005	0.252967955
2	0.055	0.08	−0.107967955	0.005	0.247967955
3	0.05	0.08	−0.107967955	0.005	0.242967955
4	0.045	0.08	−0.107967955	0.005	0.237967955
5	0.04	0.08	−0.107967955	0.005	0.232967955
6	0.035	0.08	−0.107967955	0.005	0.227967955
7	0.03	0.08	−0.107967955	0.005	0.222967955
8	0.025	0.08	−0.107967955	0.005	0.217967955
9	0.02	0.08	−0.107967955	0.005	0.212967955
10	0.015	0.08	−0.107967955	0.005	0.207967955
11	0.01	0.08	−0.107967955	0.005	0.202967955
12	0.005	0.08	−0.107967955	0.005	0.197967955

In this case, we are adapting property investment method to property valuation technique. In other words, the all risks yield is formed by the sum of a risk-free rate plus a risk premium rate. This sum determines the target rate of return. The growth factor and the depreciation will be, respectively, summed and detracted to target the rate of return. It is possible to see in the following tables the "normal version" according to the Commonwealth terminology. In this case, we have two different "all risk yields". The former is the cyclical all risks yield recovery recession (cARYRR), whilst the latter is the cyclical all risks yield expansion contraction (cARYEC). In Table 7.8, it is possible to observe the calculation of the cARYRR.

The second column indicates the variation between 0.005 and 0.06. As we have a meaningful change, it is supposed a high risk premium of 0.08 in the third column, whilst in the fourth column is indicated the medium rate of change. Depreciation rate is supposed to be constant in the simulation at 0.005, and in the final column, there is the calculation of the cyclical all risks yield in the recovery recession phase.

In the same way, it is possible to determine the cyclical all risk yield in the expansion contraction phase or cARYEC in Table 7.9.

In this table, the first column is the number of simulation: the risk-free rate RFR is proposed in the second column and will vary between 0.005 and 0.06. In the third column is proposed the risk premium rate rp as 0.08. The rate of change in the recovery recession phase is calculated on the "backward holding period" (d'Amato, 2015; Kauko & d'Amato, 2009). Depreciation rate is approximated considering Baum and Crosby indications (2014) in the fifth column. The calculation of cARYEC is indicated in the sixth column applying the formulas 7.3a and 7.3b. Risk-free, risk premium and the depreciation rate are all inputs that may vary according to the specific market segment. The valuation based on cyclical capitalization is provided in Table 7.10.

Table 7.9 Cyclical Capitalization Determination of cARYEC assuming a temporal length of the market phase indicated in the Table 7.3

	EXPANSION CONTRACTION PHASE CL area				
	Risk free	Risk premium	Rate of change	Depreciation rate	$cARY_{EC}$
1	0.06	0.08	0.085037812	0.005	0.059962187
2	0.055	0.08	0.085037812	0.005	0.054962187
3	0.05	0.08	0.085037812	0.005	0.049962187
4	0.045	0.08	0.085037812	0.005	0.044962187
5	0.04	0.08	0.085037812	0.005	0.039962187
6	0.035	0.08	0.085037812	0.005	0.034962187
7	0.03	0.08	0.085037812	0.005	0.029962187
8	0.025	0.08	0.085037812	0.005	0.024962187
9	0.02	0.08	0.085037812	0.005	0.019962187
10	0.015	0.08	0.085037812	0.005	0.014962187
11	0.01	0.08	0.085037812	0.005	0.009962187
12	0.005	0.08	0.085037812	0.005	0.004962187

Table 7.10 Cyclical capitalization determination of property value

	VALUE DETERMINATION USING CYCLICAL CAPITALIZATION (t equal to 4)					
	Risk free	Risk premium	RFR+rp	$cARY_{EC}$	$cARY_{RR}$	V
1	0.060	0.08	0.14	0.059962187	0.252967955	11.94519634
2	0.055	0.08	0.135	0.054962187	0.247967955	12.869483166
3	0.05	0.08	0.13	0.049962187	0.242967955	13.970838120
4	0.045	0.08	0.125	0.044962187	0.237967955	15.30778058
5	0.04	0.08	0.12	0.039962187	0.232967955	16.968064266
6	0.035	0.08	0.115	0.034962187	0.227967955	19.08957485
7	0.03	0.08	0.11	0.029962187	0.222967955	21.902150565
8	0.025	0.08	0.105	0.024962187	0.217967955	25.819661997
9	0.02	0.08	0.01	0.019962187	0.212967955	31.670471221
10	0.015	0.08	0.095	0.014962187	0.207967955	41.389970627
11	0.01	0.08	0.09	0.009962187	0.202967955	60.798618346
12	0.005	0.08	0.085	0.004962187	0.197967955	119.175187023

In the first column of Table 7.9, there is the number of the simulation and, in the second column, the risk-free estimation varying as in the previous tables from 0.005 to 0.06. The risk premium estimation is in the third column, whilst in the fourth column, there is the sum of risk-free and risk premium or discount rate. The fifth and sixth columns indicate the two different all risks yield. The last column provides the value calculated with the cyclical capitalization referring to the Commonwealth terminology, in the normal form. In Table 7.10, there is the comparison between the models. Using Commonwealth terminology the opinion of value based on cyclical capitalization provides values included in the interval between the direct capitalization based on the all risks yield of expansion contraction phase and the

Table 7.11 Valuation variation between the direct capitalization of cyclical capitalization with the direct capitalization using the cap rate of each phase

	VCC	VcARYEC	VcARYRR
1	11.945196347	16.677176813	3.9530698624
2	12.869483166	18.194326841	4.0327791510
3	13.970838120	20.015136519	4.1157690899
4	15.307780582	22.240910855	4.2022464706
5	16.968064266	25.023655288	4.2924358373
6	19.089574853	28.602329451	4.3865814341
7	21.902150565	33.375400446	4.4849494132
8	25.819661997	40.060591937	4.5878303484
9	31.670471221	50.094710768	4.6955421011
10	41.38997062	66.835147746	4.8084331015
11	60.798618346	100.379562046	4.9268861129
12	119.17518701	201.52403283	5.0513225679

direct capitalization based on the all risks yield of recovery recession phase. The valuation variation among different models shows how cyclical capitalization model provides value stable along the property market cycle, diminishing the value in the expansion phase and increasing prudently the value in the recession phase.

Cyclical capitalization models require a specific adaptation process to the case that may be done by the valuer. The rate of change can be extracted by a time series or subjectively estimated by the valuer according to the specific condition of the property or the market segment or both (Kaklauskas et al., 2012; Constantino et al., 2009). The temporl length assumed in the model may be influenced by the combination of market phase and the duration of the lease (d'Amato et al., 2019a, b). In the following last application will be applied the strong form of cyclical capitalization. In this case, there are not only two different all risks yield but also two different discount rates allowing the appraiser to model different risk premium per each market phase. This application of the strong form will be offered relying on the Commonwealth terminology. The application of the second formula in Table 7.1 will change both Tables 7.9 and 7.8 as follows:

In Table 7.11, it is possible to observe that in the recovery recession phase, the risk premium is higher. As a consequence, in the strong form, the model will have not only two different all risks yields/overall capitalization rates but also two different target rates of return. In this application, the role of the contractual rents and the role of vacancy have been omitted, even if they have been included in the model in previous papers. Therefore, it is possible to calculate the value of the property in different way as in Table 7.12.

In the Table 7.12, the final result of the application of strong version of cyclical capitalization. Comparing the results of the two models, the final output of the strong version is higher than the normal version. This happens because of the different weights of the discount rate that are different in the two market phases. On the other side, this difference makes the model closer to the change in the real estate market (Table 7.13).

Table 7.12 Application of strong form of cyclical capitalization

	RECESSION RECOVERY PHASE CL Area				
	Risk free	**Risk premium**	**Rate of change**	**Depreciation rate**	$cARY_{RR}$
1	0.06	0.09	−0.107967955	0.005	0.2629679552
2	0.055	0.09	−0.107967955	0.005	0.2579679552
3	0.05	0.09	−0.107967955	0.005	0.2529679552
4	0.045	0.09	−0.107967955	0.005	0.2479679552
5	0.04	0.09	−0.107967955	0.005	0.2429679552
6	0.035	0.09	−0.107967955	0.005	0.2379679552
7	0.03	0.09	−0.107967955	0.005	0.2329679552
8	0.025	0.09	−0.107967955	0.005	0.2279679552
9	0.02	0.09	−0.107967955	0.005	0.2229679552
10	0.015	0.09	−0.107967955	0.005	0.2179679552
11	0.01	0.09	−0.107967955	0.005	0.2129679552
12	0.005	0.09	−0.107967955	0.005	0.2079679552
	EXPANSION CONTRACTION PHASE CL Area				
	Risk free	**Risk premium**	**Rate of change**	**Depreciation rate**	$cARY_{EC}$
1	0.06	0.08	0.085037812	0.005	0.059962187
2	0.055	0.08	0.085037812	0.005	0.054962187
3	0.05	0.08	0.085037812	0.005	0.049962187
4	0.045	0.08	0.085037812	0.005	0.044962187
5	0.04	0.08	0.085037812	0.005	0.039962187
6	0.035	0.08	0.085037812	0.005	0.034962187
7	0.03	0.08	0.085037812	0.005	0.029962187
8	0.025	0.08	0.085037812	0.005	0.024962187
9	0.02	0.08	0.085037812	0.005	0.019962187
10	0.015	0.08	0.085037812	0.005	0.014962187
11	0.01	0.08	0.085037812	0.005	0.009962187
12	0.005	0.08	0.085037812	0.005	0.004962187

Table 7.13 Valuation variation between the direct capitalization of cyclical capitalization with the direct capitalization using the cap rate of each phase

	VCC	VcARYEC	VcARYRR
1	12.02476303	16.677176813	3.9530698624
2	12.95982383	18.194326841	4.0327791510
3	14.07448576	20.015136519	4.1157690899
4	15.428160457	22.240910855	4.2022464706
5	17.109947078	25.023655288	4.2924358373
6	19.259855066	28.602329451	4.3865814341
7	22.111275587	33.375400446	4.4849494132
8	26.084494768	40.060591937	4.5878303484
9	32.020740821	50.094710768	4.6955421011
10	41.885505787	66.835147746	4.8084331015
11	61.589836611	100.379562046	4.9268861129
12	120.86835428	201.52403283	5.0513225679

Conclusion

The current methodology to address the mortgage lending value (Value at Risk) is the usual financial tool introduced in the real estate market as a way to determine mortgage lending value allowing the appraiser to become a risk manager. It seem a "modern" and "enthusiastic" way to deal with the appraisal profession, but in the last word means transferring the risk of a bank manager on the shoulder of an appraiser, a risk that an appraiser should assume in an asymmetric market with imperfect information, a market in which the "Olympic" hypothesis of Value at Risk model should prevent the valuer and academician from a massive and lighthearted application. The limits of the weak and the strength point of this have been highlighted in literature (Bienert & Brunauer, 2007). There is not need to say that this chapter proposes an alternative. A valuer may provide an opinion of value and cannot take the risk of a bank manager. In the final Table 7.14, there is a comparison between the traditional direct capitalization and the cyclical capitalization in its normal and strong form.

Accepting that a real estate may have different market phases means that the definition provided by the definition of mortgage lending value and indicated in Fig. 7.1 is very difficult to reach. In this chapter, the determination of mortgage lending value cannot be an escape from reality. A description far from the real job of a valuer. Probably, we need to reinvent a different approach to mortgage lending value in order to include the reality in the definition of mortgage lending value. The straight line representing the mortgage lending value according to German Law is an escape from reality (White and Turner, 1999). How can we reach them? How can be

Table 7.14 Comparing inputs of cyclical capitalization with inputs with traditional direct capitalization

	Cyclical capitalization	Traditional direct capitalization
Rent	Assumes a rent that may vary along the time at different growth rates	Assumes one only rent increasing over the time or a rent always constant
Growth rate	Assumes more than a growth rate and more that one depreciation rate accoring to different market phases	Assumes on only growth rate and one only depreciation rate
Target rate of return/discount rate	Assumes one/more discount rate (nornal/strong form)	Assumes one only discount rate
All risks yield / overall capitalization rate	More than one all risks yield calculated in two ways: personal expertise of appraisers; calculation of growth rate based on a previosuly observed time series (backward holding period) in order to define at least one all risks yield per each market phase	Despite the cyclicality of the asset one only all risks yield is assumed mainly calculated with a comparison with other properties in the same time of the valuation. It is supposed that the same all risks yield is always meaningful along the economic life of the commercial property

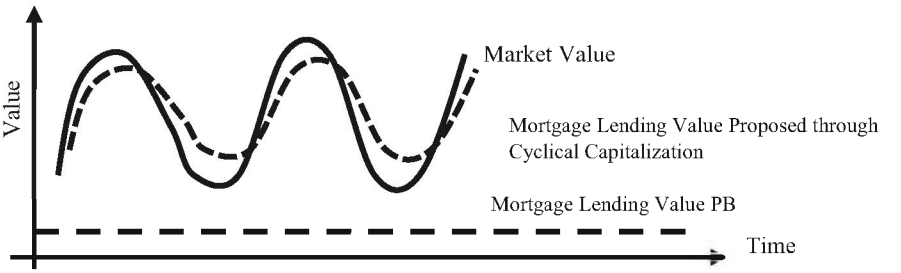


Fig. 7.3 Mortgage lending value and market value in the application of cyclical capitalization (Lentz & Wang, 1998)

the mortgage lending value indifferent to real estate market phases? The proposal of this chapter is the application of cyclical capitalization modelling for mortgage value determination. As a consequence, the mortgage lending value definition may change as indicated in Fig. 7.3.

As one can see in Fig. 7.3, the mortgage lending value follows and manages the speculative part of the value, finding a way to provide a more prudent value in the phase of the expansion contraction and a higher value in the phase of recovery recession. In this view, the valuer will not be involved with "eliminating speculative components", and we honestly invite those who proposed this explanation to explain how this is possible, but the valuer will observe the reality and will manage the property market cycle including it in the valuation process, dealing with it in different form (strong, normal) assuming specific assumptions on vacancy lag and contractual terms (d'Amato, 2017b; d'Amato et al., 2019a, b; Constantino et al., 2009). Finally, we do not believe in simple solutions or model born in the world of finance, we cannot compel the sea to be calm, but we may manage to understand better the waves and address them properly.

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Chapter 8
The Effect of Heuristics and Biases on Real Estate Valuation and Cyclicality



Esra Alp Coskun

Abstract There are several underlying factors of cyclicality in property markets. Two of these factors are heuristics and biases which have significant impacts on appraiser judgments in real estate valuation process. All estimates include a kind of uncertainty at different levels, and real estate valuation also includes an uncertainty as it is a price estimate aiming to determine the present value of future cash flows. The uncertainty may increase the tendency to use heuristics and biases during real estate valuation due to the complex nature of valuation decision-making. Based on the relevant empirical and experimental literature, these heuristics and biases widely investigated are anchoring and adjustment heuristic, recency heuristic, herding behavior, representative heuristic, loss aversion, regret aversion, false reference point, client feedback, and appraisal smoothing bias. The aim of this study is to explain the role of uncertainty which gives rise to heuristics and to highlight the relation between these heuristics and real estate valuation process and cycles.

Keywords Behavioral real estate · Real estate valuation · Heuristics · Biases · Uncertainty

Introduction

Heuristics are cognitive shortcuts which individuals use in order to ease the decision-making process and reduce time needed to analyze all data received, particularly when the information is too much and complex. Uncertainty may arise from ambiguity or ignorance, but since it is impossible for a human being to reach all relevant information and process the data in a short span of time, this also implies that all decisions will involve uncertainty to some extent. Another factor which influences the decision-makers is bias. Bias is the tendency to support or be against to an idea, an individual, a group, or a behavior. Biases are not objective, can be

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inherent, or can be learned, and they cause people to make irrational decisions which is of utmost importance when it comes to determining whether a market is efficient or not.

In an efficient market (Malkiel & Fama, 1970), prices reflect all relevant information, and it is not possible to make a profit which is exceeding the average return. Efficient market hypothesis cannot explain cycles, booms and busts, and irrational behaviors of the actors. In the real world, decision-makers use heuristics and biases, markets include some uncertainty, and risk preferences and expectations of people vary. Therefore, it is not realistic to assume a market to be efficient and all decision-makers to be rational. Aforementioned factors affect the prices of assets; hence, price bubbles and cycles may occur from time to time.

The traditional approach to efficient market hypothesis has been criticized and starting from the General Theory of Keynes proposed a financial instability process. Key works for this theory have been proposed by Minsky (1975, 1986). The first theorem of this theory is that the economy has financial regimes that rule the market in a stable way and financial regimes that determine instability. The second theorem shows that over prolonged prosperity period, the economy moves from financial relation working for financial stability to financial relations that make the system unstable. In the process described by the second theorem, there are consequences for both property and financial markets. This is particularly true because property transactions are normally based on debt financing (Dasso & Ring, 1989). Therefore, the valuation of the mortgage lending value is critical in this process. In fact, the valuation process is the base of the lending process, and an accurate valuation may contribute to preserve the system from "unstable financial relation" according to Minsky's theory. Unfortunately, the process described by Minsky is the only one that includes the problem of the bubbles neglected in the view of neoclassical economy.

The most effective actors setting the prices in real estate markets are property appraisers. Therefore, it is essential to analyze the effects of heuristics and biases that influence the appraisers' valuation judgments. Appraisers' irrational price determination can increase the inefficiencies in real estate markets and lead to price bubbles and cycles. The heuristics and biases which are mostly found to be influential in determining the property prices are anchoring and adjustment heuristic, recency heuristic, herding behavior, representative heuristic, loss aversion, regret aversion, false reference point, client feedback, and appraisal smoothing bias. Although some empirical researches have been carried out on heuristics and biases which affect the valuation decisions, there is very little scientific understanding of the relationship among real estate cycles, valuation methods, and behavioral factors. So far, there has been little discussion about the cyclical nature of real estate valuation and heuristics/biases that contribute to the cycles in the market. Thus, the aim of this chapter is to explain the role of uncertainty which gives rise to heuristics and biases and to highlight the link between these heuristics and real estate valuation process and cycles occurring in the market.

In the second part, the effect of uncertainty and risk as the nature of valuation is explained. In the third part, aforementioned heuristics/biases which are extensively

examined in the relevant literature are described, and the relationship between real estate cycles and these heuristics/biases is discussed. In the conclusion part, the main contribution of the study is summarized, and policy suggestions are given in order to avoid such heuristics/biases.

The Nature of Valuation: Uncertainty and Risk

It was argued in the Mallinson Report that all valuations are uncertain (Mallinson & French, 2000). As valuations are professional estimates of the price made at the time of the valuation, market values are not certain (French, 2020; French & Gabrielli, 2004, 2005). All estimates include a kind of uncertainty at different levels, and property valuation also includes uncertainty as it is a price estimate and aims to determine the present value of future cash flows. Moreover, due to its nature, property differs from other asset classes. Property is not a standard asset and differentiates by type of the property and occupied space. Indivisibility, high price threshold and low liquidity cause few transactions. Moreover, low market transparency and low market efficiency also increase the uncertainty of the valuation process (Meszek, 2007). Lee and Park (2020) state that a low level of market activity leads to uncertainty due to lack of evidence for market value.

The first attempt to explain the uncertainty in valuation process was made by the Royal Institution of Chartered Surveyors (RICS), and it was led by Michael Mallinson, who was the CEO of a UK real estate fund which then became one of the largest in the UK. A reviewer group worked on the case of improving the standards of valuation, and one of the recommendations of this review (IVSC, 1994) suggested that standards and methods should be developed for measuring and expressing valuation uncertainty (Thorne, 2020). As it is emphasized in the review, uncertainty doesn't arise only from market conditions and abnormal periods but also from the measuring and explaining methods. According to the Technical Information Paper n.4 of the International Valuation Standards Council, there are three sources of uncertainty in the valuation process. In RICS (2012, 88), inherent uncertainty is described as below:

> The property itself may have particular characteristics that make it difficult for the valuer to form an opinion of the likely value. For example, it may be an unusual, or even unique, type of property. Similarly, the quantification of significant hope value, either related to potential planning permission or the existence of a special purchaser, will be highly dependent on the assumptions made.

Moreover, choice of method may itself be a source of valuation uncertainty (IVSC, 2017):

> For many asset types, more than one method or model may be commonly used to estimate value. However, those methods or models may not always produce the same outcome and therefore the selection of the most appropriate method may itself be a source of valuation uncertainty.

Tversky and Kahneman (1974) state that judgments and decisions in situations of uncertainty are often led by heuristics and biases. Clayton (1997) also indicates that intangible expectations lead prices to deviate from the fundamental or intrinsic values and housing price booms are driven primarily by irrational expectations. Therefore, uncertainty-driven heuristics and biases may induce price inefficiencies. As it is about the nature of valuation, when the appraiser faces with uncertainty, it has to be reported to the client (Tegova, 2012):

> Where the valuer is aware of market uncertainty, volatility or other issues putting the value at risk, these should be considered and reported in the assessment.

A few studies in the literature attempt to explain the uncertainty in the property valuation process. For instance, Meszek (2007) employed game theory approach. The strategic model suggested by Meszek (2007) is in the form of a two-player zero sum game, where its nature is more complex than the "game with nature." This corresponds to the essence of the "Nature with Nature" game. Krause et al. (2020) analyze the uncertainty in the point estimate from automated valuation models (AVMs) and compare two of the most common approaches to estimate AVM uncertainty – model-based and error-based prediction intervals. Empirical findings of the study reveal that model-based approaches outperform error-based ones in all but cases with very highest confidence level requirements. Lee and Park (2020) apply a deep learning approach – neural networks – in order to estimate the house prices. The results imply that Bayesian neural network approach can model uncertainty in property valuation. French (2001) uses scenario analysis for the purpose of measuring and explaining uncertainty in price estimation.

In another study, French and Gabrielli (2004) argue that valuation models (in the UK) are based on comparable information and rely on single inputs rather than probability-based models. However, uncertainty is probability-driven. In a decision-making process, uncertainty is due to the lack of knowledge, and risk is the measurement of a loss identified as a possible outcome of the decision. By making this distinction between uncertainty and risk, French and Gabrielli (2004) state that the outcome of a valuation can only be certain if one can predict the future accurately which is not possible. Thus, there will always be an element of risk that the "actual" value differs from the estimated value. Therefore, in the study, a probability-based model is suggested in order to measure the uncertainty and report it to the client.

Uncertainty may arise from unusual and abnormal conditions or from market activities. Uncertainty may also arise from the biases and heuristics of valuers. A heuristic is the use of cognitive shortcuts in solving complex problems or making a decision (Simon, 1978). Ali et al. (2020) focus on the behavioral uncertainties including biases, client influences, heuristics, professional ethics, and opportunistic behaviors in making the valuation judgment. When the inputs, namely, information, increase, people tend to use shortcuts. This heuristic rule can ease valuers' time and effort and also reduce transaction cost of searching and information needed in making a valuation decision (Ali et al., 2020). There are many types of heuristics and biases that may affect the valuers such as representative heuristic, availability heuristic, anchoring and adjustment heuristic, and positivity/confirmation heuristic.

The main focus of this study is to highlight the impact of heuristics and biases on the cyclicality of the property valuation. In the next section, the biases and heuristics which are effective in the decision-making process of valuers are discussed.

Heuristics, Biases, and Property Valuation Cyclicality

In the literature of cyclicality in different markets, there are several approaches that attempt to explain the possible underlying factors. For instance, Jevons (1878a, b) correlated the sun's rays with economic cycles which Keynes (1936) also agreed with the notion of "use of market participants' moods" to explain the transmission and magnification of the boom and bust phases of the cycle. Jevons's use of psychology to explain business cycles was originated in John Mills's study (1867) (Newman, 2021). On the other hand, Schumpeter (1939) pointed out that innovations were the most significant factors that cause the business cycles. According to Kondratieff and Stolper (1935), business cycles were related with the long-term development of capitalist economies.

Cyclicality in property markets is related with several factors. One of the reasons of cycles is future price expectations, hence speculation. Optimistic investors rely on past prices for their future price expectations which are also called "myopic pricing" have an impact on prices and cycles (Malpezzi & Wachter, 2005). As well as expectations and speculation from the demand side of property markets which influence the prices and have a role on the cycles, appraisers' heuristics and biases also affect the property valuation process. On the contrary to efficient market hypothesis (Malkiel & Fama, 1970), these irrational behaviors of appraisers cause property prices to deviate away from the efficient points, and this may contribute to a cycle. The heuristics and biases that mostly influence the property valuations are anchoring and adjustment heuristic, recency heuristic, herding behavior, representative heuristic, loss aversion, regret aversion, false reference point, client feedback, and appraisal smoothing bias.

The anchoring and adjustment heuristic was first identified by Tversky and Kahneman (1974) which means that a decision-maker evaluates a given value as a reference point (anchor) in order to make an estimation. The relevant literature indicates that "the higher the ambiguity, and the lower the familiarity, relevance or personal involvement with the problem, the stronger the anchoring effect" (Van Exel et al., 2006; cited in Mugerman & Ofir, 2020). This heuristic is widely seen in the property market among valuers. Diaz and Hansz (1997) state that appraisers rely on previous value estimates made by other appraisers or by their own in the presence of greater market uncertainty (i.e., Quan & Quigley, 1991; Geltner, 1993; Diaz & Wolverton, 1998; among others). According to Yiu et al. (2006), anchoring can be linked to previous prices or other references and may be classified as behavioral/systematic bias. Some references may be acceptable such as comparable properties containing valuable information, whereas others like the opinion of the owner may be consider unacceptable.

It is possible to consider inside random bias: appraisal smoothing, overreaction, and purely random. Appraisal smoothing (Geltner, 1989) is the reduced variability of the appraisal compared to the previous valuation. It can be considered at two different levels. The former is the aggregate level mainly referred to as appraisal-based index. This is mainly due to two different causes: the temporal aggregation bias and the seasonality of reappraisals (Hansz, 2000). Several contributions explored appraisal smoothing at the aggregate level (Geltner, 1993; Brown & Matysiak, 1998; Diaz & Wolverton, 1998; Clayton et al., 2001). The latter level is the disaggregation level mainly caused by appraisal behavior and appraisal process. In this domain, the Quan-Quigley model is normally used to understand appraisal behavior (Hansz, 2004a). Several criticisms to this model have been raised (i.e., see Lai & Wang, 1998; Clayton et al., 2001; Diaz & Wolverton, 1998). While appraisal smoothing is a lower reaction at the aggregate or disaggregate level of the current valuation compared to the previous valuation, it is also possible to observe different behaviors such as overreaction or even a random behavior comparing the present valuation to the previous valuation. A further bias may be caused by the client influence that can be defined as a systematic bias (Yiu et al., 2006)

In Northcraft and Neale (1987), one of the first studies that investigated the use of a decisional heuristic-anchoring-and-adjustment in an information-rich, real-world setting, students and real estate agents toured and made pricing decisions about real estate properties. The first hypothesis tested in the study is "listing price will bias value estimates of the fair market value (FMV) of residential real estate," and the second hypothesis is "the biasing influence of the listing price on estimates of FMV will decrease as the listing price becomes a less credible estimate of FMV." In the experiment, participants were both amateurs and professionals, and different listing prices were given to four groups. According to the results of the experiment, estimates of both subject populations were significantly biased by listing prices. Interestingly, professionals/experts were more unlikely to admit that they considered the listing prices as anchors; however, amateurs appeared more aware of the role that listing prices play in their judgments.

Cho et al. (2014) indicated that when property valuation becomes uncertain, appraisers depend on a greater extent of past valuation and thus smoothing increases. Appraisal smoothing is defined as a temporal lag bias in appraisals (Clayton et al., 2001). Fisher et al. (1999) examined appraisal smoothing bias by using a sample of 2,739 transactions of properties sold between 1978 and 1998. They found evidence that appraised values lag contemporaneous transaction-based valuations. Based on the comparison of sale prices with appraised values of the same properties, findings indicated that transaction prices were on average 4.6% higher than appraisals when the real estate asset market was rising from 1978 to 1985. During the declining market during 1988–1992, the relationship reversed with sales prices averaging 4.5% below the corresponding appraisals. Empirical findings of another study by Clayton et al. (2001) suggested that as uncertainty about new information increases, less weight is rationally placed on the new information. Appraisers tend to rely more heavily on older data already used in previous appraisal reports or on those reports directly. Another experimental study by Diaz and Wolverton (1998) also found

evidence on appraisal smoothing bias. In the study, expert appraisers from Atlanta were asked to value a hypothetical apartment project in Phoenix, and after 8 months, they were asked to update their valuation according to the new information about certain market and property changes. Results suggested that appraisers used previous value judgments and their adjustments were insufficient.

According to the empirical findings of Cho et al. (2014), smoothing increases when property prices increase. This could be interpreted that appraisers have a tendency to use a similar return to that of the previous period when they value real estates during boom periods. Findings also reveal that smoothing increases with credit spread. As credit spread reflects risk, the positive relationship between smoothing and lagged credit risk implies that appraisal smoothing increases when valuation becomes more difficult because of high uncertainty in the economy (Barberis & Thaler, 2005; Zhang, 2006; cited in Cho et al., 2014). Another finding of the study revealed that smoothing decreases with sentiment and this negative relationship indicates that appraisers become over-reactive to information when sentiment is high. Therefore, appraisal smoothing increases during the periods of recession or when economic outlook is not promising.

The effect of the order of the receipt of information on the belief revision process was examined by Ashton and Ashton (1988), Assere (1992), and Messier Jr (1992). According to the relevant studies, the information received early (later) in the sequence has a greater effect on the outcome of a task which are defined as primacy (recency) effect (see Havard, 2001). Recency effect is also similar to anchoring heuristic because of the effect of the prior knowledge on the valuers' judgments. Levy (1997) found evidence on recency effect in an experimental study. According to the findings, the estimate of selling price of a specific property was influenced by the prior property on which selling price was estimated. Gallimore (1994) also examined recency heuristic by using a questionnaire with a group separated into two. In the study, respondents were given a 50% confidence interval of a property's market value on a per square foot basis. The comparable values were given as "two confirming comparables followed by two disconfirming comparables or two disconfirming comparables followed by two confirming comparables." The group receiving the confirming comparables last were found to be more confident in their estimation than the group receiving the disconfirming comparables last.

As a result of anchoring and adjustment heuristic and recency heuristic, the concept of "false reference point" is an important case which has already drawn attention in the literature. For instance, let's assume investors invest in a specific stock for $100 on January, and over the next 6 months, if the price increases to $200 and by the end of the year if the price decreases to $150, then which price will be considered as a reference point by the investors in order to evaluate their gain or loss? The evaluation would be possible in two ways: First, they can consider the first and last prices of the stock and calculate their gain as 50% ($150–$100). Second, they can change their reference point to $200 because at this point, they could gain 100% if they sold the stock. Thus, they can feel as if they lost $50 in 6 months rather than focusing on the gain of 50% in 6 months. Poteshman and Serbin (2003) found evidence that investors generally tend to select a stock's 52-week high

as the appropriate reference point which leads them to make bad decisions on selling the stocks depending on regret aversion. They keep holding the stocks which are decreasing. This behavior is also known as "disposition effect"[1] (Shefrin & Statman, 1985). Disposition effect may be minimized by using "hedonic framing," a mental approach, which suggests that framing gains and losses separately helps investors to reduce pain of losses and the effect of regret (van Raaij, 2016). These heuristics have an influence on the property market when people consider the false reference points and feel regret to sell their houses depending on the price fluctuations. When homeowners already make a profit from buying the house, it is possible for those to sell the house in 1 year. However, if the homeowners feel like they had experienced a loss after buying their house, it will be difficult to sell their house or accept a lower price to sell because they will consider the highest price level observed recently as the appropriate reference point. For instance, in the study of Seiler et al. (2008), Hawaiian market is given as an example. According to the study, home prices increased rapidly in the Hawaiian market in the late 1980s:

> Those who bought near the peak had to stomach a downward market for the next decade. In 2001, when the real estate market finally turned around, those who bought in 1989 were still looking at prices below what they paid. These investors were hesitant to sell. For investors who bought near the bottom in 2001, they were willing to sell as soon as one year later because they had already made a profit. But it wasn't until only recently that buyers from the late 1980s began to sell because doing so sooner would have meant selling their home at a loss.

False reference points cause homeowners or investors to focus on a loss which may be right from a different point of view; however, it is not rational since they have a gain in real. Focusing on the possible losses leads them to behave irrationally. Pandey and Jessica (2018) stated that real estate investors with loss aversion are highly sensitive to losses, and they believe that property prices can be slightly better but infinitely worse; hence, loss aversion is an important determinant of real estate prices (Leung & Tsang, 2013; Genesove & Mayer, 2001; Bokhari & Geltner, 2011; cited in Pandey & Jessica, 2018).

The homeowners' and investors' decisions in real estate markets appear to be under the influence of heuristics which also affect the property prices and appraisers' valuation. A large and growing body of literature has investigated the effect of client feedback on appraisal judgments (Levy & Schuck, 1999, 2005; Wolverton & Gallimore, 1999). Freybote et al. (2014) argue that according to experimental studies, clients tend to request an upward adjustment if a value estimate is below the pending mortgage amount, signaling appraisers that their estimates are too low and appraisers respond to the "too low" feedback of their clients (Cho & Megbolugbe, 1996; Hansz, 2000, 2004b; among others).

[1] The approach of disposition effect is derived from the well-known study of Kahneman and Tversky (1979). Accordingly, prospect theory describes how losses feel more painful to an investor than an equivalent gains feel good (Seiler et al., 2012).

Another heuristic that is seen among appraisers is herding behavior. Bucchianeri and Minson (2013) state that according to the robust and large literature on anchoring effects, there is a positive relationship between listing prices and sale prices; however, according to the auctions, literature herding behaviors cause an opposite relationship. The evidence for anchoring effects suggests that homeowners/sellers may benefit from setting higher listing prices. A sale of a house begins with an auction-like process, and the auctions that open with low asking prices generate a greater number of bids and ultimately finish with higher closing prices (Ku et al., 2005, 2006; Simonsohn & Ariely, 2008; Bucchianeri & Minson, 2013). Banerjee (1992) explains this pattern as herding behavior. Weber (2016) claims that real estate actors tend to imitate each other's behavior which is also known as "herding" in the literature and links this behavior with the cyclicality:

> The coordinated calculative behaviors of key professionals (e.g., developers and lenders) attract other members of the industry (e.g., appraisers and brokers) to and away from similar property types and submarkets at roughly the same time, causing construction activity and property values in the aggregate to crest and wane.

According to Weber (2016), property cycles involve acting collectively in concert. Uncertainty also triggers herding-like behaviors, and during such periods, real estate actors have incentives to imitate each other's behavior which is thought to be responsible for the property cycles.

Ali et al. (2020) pointed out that representative heuristic is similar to stereotyping which is also related with the herding behavior. According to the representative heuristic rule people should associate things that are alike and group them together, usually invoking "the principle that members of a category should resemble a prototype" (Schick & Vaughn, 2014; cited in Johnson, 2018). Ali et al. (2020) stated that stereotyping also applies to the herding behavior or cascade effect and it induces the valuer to follow the majority of valuers, namely, the herd. Valuers rely on the valuation information of the herd rather than their own independent analysis and private information, and this makes them feel more comfortable about their valuation which they think is more validly acceptable and correct. High uncertainty, regarding pricing of heterogeneous assets in commercial/industrial assets and land or technical knowledge in the valuation process, leads the tendency of representative heuristic and herding behavior as well as other types of heuristics.

What we know about the behavioral aspects affecting the real estate valuation decisions is largely based upon empirical studies that investigate how appraisers exhibit those biases and how these behaviors are led by uncertainty and also how the cyclical nature of valuation process improve such biases. There is a considerable amount of literature that found evidence on the relationship between abovementioned heuristic types, valuation decisions, and real estate cycles. Based on the relevant literature, uncertainty leads to heuristics and biases (Tversky & Kahneman, 1974; Costantino et al., 2009), and this kind of irrational valuation decisions induces market inefficiencies and cycles. On the other hand, valuation methods itself create uncertainty (IVSC, 2017) and improve these heuristics.

Concluding Remarks

The main goal of the current study was to identify the effects of heuristics and biases on appraisers' judgments mostly driven by uncertainty which is actually related to the nature of valuation. Moreover, it is vitally important to look from different perspectives in order to better understand the underlying factors of cyclicality in real estate markets. The heuristics-cognitive shortcuts and biases such as anchoring and adjustment heuristic, recency heuristic, herding behavior, representative heuristic, loss aversion, regret aversion, false reference point, client feedback, and appraisal smoothing bias are widely examined in the literature, and findings are commonly confirming that appraisers and other real estate actors are impressed by these heuristics and biases. The relevant literature reveals that these behaviors of real estate actors may cause deviations from fundamental price which may eventually create a cycle in the property market.

The following conclusions can be drawn from the present study:

(i) Appraisers generally consider their own prior valuations or other appraiser's valuations as the reference point (anchoring and adjustment).
(ii) They consider the most recent information primarily (recency effect).
(iii) They rely on the valuations of majority of valuers, namely, the herd; hence, they feel more comfortable with this imitated valuation (herding/representative heuristic).
(iv) When the uncertainty is high, appraisers may depend on a greater extent of past valuation, and thus appraisal smoothing increases.
(v) When evaluating the gains and losses, homeowners and investors use false reference points, and these lead to another bias "disposition effect." They hesitate to decide to sell their property because of loss aversion or regret aversion led by the usage of false reference points at the first stage.
(vi) Those who are afflicted by loss aversion or regret aversion because of using false reference points also attempt to influence the appraisers with feedbacks claiming that the price determined by the appraiser is too low (client feedback).

All those factors (heuristics and biases) preventing the appraisers from determining the true price of a property lead to inefficiency in real estate markets, and this may create cycles from time to time. There may be also other factors causing the cycles, but this point of view highlights the problem at an individual level. Hence, it becomes possible to specify requirements in order to raise awareness of such factors that may be responsible for the cycles. Any policy implementation targeting to raise the awareness of appraisers and also other market actors and to increase the efficiency of the market would be advantageous in order to struggle with cyclicality which increases the uncertainty, influences the expectations, and causes loses.

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Chapter 9
Standardized Valuation of Real Estate Reflecting Cyclical Economic Development: Experience of the Last Two Decades



Kaarel Sahk

Abstract The real estate development in Estonia, as in all Baltic States, is strongly related to the restoration of independence in these states in 1991. On the one hand, the birth of the real estate market and therefore the need for real estate valuation were not grounded on empty space, so from the historical perspective, the roots of the valuation procedure reach the first years of the twentieth century. On the other hand, the development of valuation was a subject of the reorganization of economics, as it changed from planned economy to market economy. Therefore, the development of economy and the real estate market, including the valuation procedure, began in the context that accounts for the cyclical behavior thereof. In addition, various politically important dates, like the start of the membership in NATO, membership in the EU, or two monetary reforms, play a huge role in this process. The current environment of valuation procedures is a result of the publication of the edition of the International Valuation Standards (The translation was based on the edition of IVS 1994) (IVS, 1994) in 1997, which, in cooperation with professional certification, led to permanent national valuation standardization. In fact, a large amount of the valuation reports are addressed to the housing and other investment sectors that, in turn, reflect the behavior of the construction and industrial sectors and the health of all economy. Indeed, while the interrelated sectors are or the overall economy is rapt by the market cycle, the consideration of the cycles' influence becomes unavoidable.

Keywords Ownership reform · Land valuation · Real estate valuation · Cycle · Economic factors · Legal influencers

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Ownership Reform as an Engine

The appraisal of real estate as a procedure, which is also widely called "property valuation," is a common part of the economy of every well-developed society. We may follow the situation if we start to specify the different stages of the economic development of newly independent states that restored their independence during the first years of the 1990s.

In the early 1990s, ownership reforms commenced in all three Baltic States (Estonia, Latvia, and Lithuania) following the restoration of their independence and the foundation of a new democracy (Kursis, 1999; Elmet & Sahk, 2002). Actually, the independence process in all three states began already in the mid-1980s as a result of the new Soviet policies of Perestroika (reconstruction) and Glasnost (openness) led by Mikhail Gorbachev, the former General Secretary of the Communist Party of the Soviet Union. These two policies liberalized almost all aspects of life throughout the Soviet Union and considerably in Estonia, which has a historically strong German influence (the former Baltic nobles) and a traditional relationship with Finland and Sweden.

The independence movement in the Baltic States started in August 1991, after the August Coup in Moscow and the shock of the collapse that followed. Immediately after its independence and return to statehood, Estonia started the process of restitution of the rights of former owners whose land, buildings, and other properties, as well as enterprises and machinery, had been nationalized as a result of the incorporation of all Baltic States into the Soviet Union in 1940.[1]

The restitution as a process was grounded on the Republic of Estonia Principles of Ownership Reform Act (1991), which entered into force in June 1991 and thus, as an important side note, was passed before the restoration of independence. On the other hand, the reform needed legal support; so, in October 1991, the Land Reform Act (1991) was passed, which, unfortunately, included many signs of rushing[2] due to its fast adoption. Therefore, there also exists one huge difference, as the role of the valuation or appraisal[3,4] procedure did not have the same homogeneous nature and importance during the second period of independence of the state; this approach not only is similar for Estonia but seems to be the same for all Baltic States and for most of the newly independent states (NIS), also called the Visegrád Group States (Gaidar, 1997).

Simultaneously with the ranking of the relevance of the valuation procedure, we may outline the contingent relationship of the divergent legal acts, starting with the

[1] The expropriation that results in restitution refers to the years 1940–1981, as specified in the act.

[2] As a result of rushing, the founding legal act was amended on the level of the State Assembly 25 times.

[3] Hereinafter the term used in this chapter meaning the estimation of real estate is "valuation."

[4] Manya M. Mooya (2016) explains that the professional practice that represents the practical expression of the translation of different conceptions of value into more utilitarian economic conceptions is called real estate valuation or real estate appraisal (in the USA).

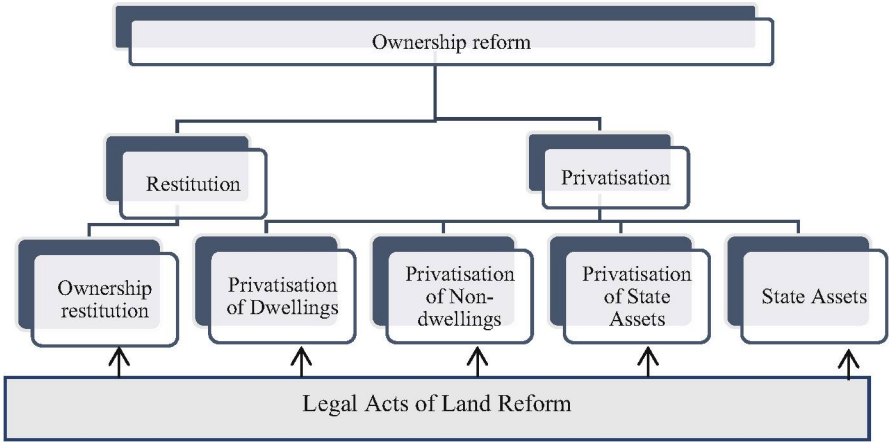


Fig. 9.1 Structure of ownership reforms. (Source: Author's own representation)

Principles of Ownership Reform Act, with the economic development, and with the valuation procedure itself. On the one hand, we may conclude that the compulsory return process is one part of the economic development; on the other hand, it is a clearly distinguishable and cyclical marker thereof. It is more than evident that various systems of ownership reform are the most significant actors and markers that are modelling the new economic principles, assist to the birth of construction and real estate markets, and, of course, thereby contribute to the emergence of real estate valuation and construction cost estimation.

None of these changes would have been possible without the concurrent and expedient creation of a new legal system. As transparent as the need for changes in the legal system was, it also served the fact that there was a need for new education, subjects, and curricula, which means, in the current context of real estate education, more real estate valuation education (Elmet & Sahk, 2002) (Fig. 9.1).

During the ownership reforms, a large number of ownership rights were restored, and properties were returned to their former owners. In addition, as a result of the privatization of dwellings and state property, many people became property owners for the first time in their lives. These new owners were the people who lived in dwellings previously owned by the state, who suddenly had the right to privatize them. In this situation, besides the restitution, dwelling privatization was an early inducer of the need for valuation and appraisal under universally recognized approaches, in spite of the fact that the original substance of the valuation was not legally connected to land. All these processes added to the emerging market, besides the corps of owners, a strong and urgent need for a qualified, specialized corps of real estate professionals, of whom there were none on the market. In the context of this chapter, these professionals are mostly real estate valuators. The legal acts underlying the emerging real estate market, i.e., the birth of the real estate valuation market in Estonia, were:

Principles of Ownership Reform Act (1991)
Land Reform Act (1991)
Privatization of Dwellings Act (1993)
Privatization of Non-dwellings Act (1995)
Privatization Act (1993)
State Assets Act (2009)

In addition to these six main legal acts as roots for success, the reform was strengthened by other legal acts such as the Land Valuation Act (1994), Land ordinary valuation decree (2001), Land extraordinary valuation decree (1996), etc. The last three are legal texts that, simultaneously with the establishment of the Estonian Association of Appraisers, created the proper environment and conditions for the birth of the profession of real estate appraiser as well as the real estate valuation market.

Real Estate Valuation System

Before observing the birth, childhood, and adulthood of the real estate valuation profession and the valuation procedure itself, it is necessary to give a short retrospective glimpse at previous historical regulations.

The oldest historical documents show that land on the territory of Estonia was assessed already in the twelfth to thirteenth centuries, when the land was assessed for agricultural needs, carried out under the legislation of the Danish kingdom (the so-called plough-land assessment). After the occupation of Estonia by Poland and Sweden, Estonia was under Russian hegemony for a long time, resulting in the Baltic Private Law issued in 1865 that was in use up until 1940.[5] The Russian construction law, issued in 1901 (Seaduste kogu, 1900), lost its power in Estonia only in 1938, when Estonia's own Construction Law (Ehitusseadus, 1938) entered into force.

In some respects, it is possible to find the theoretical roots of real estate valuation in Estonia in the first valuation regulation that was printed in 1902 and named "Valuation of mobile and immobile property in Livonia"[6] (Tõnisson, 1902) or in "Legal Act of Real Estate Valuation Outside Towns and Settlements," issued in 1923 by the State Assembly (Väljaspool linnu ja aleveid... 1923). These roots created a differentiation between immobile and mobile properties, i.e., a difference between land valuations based on whether the land is built up or not, as well as where the real estate is located – in a city or a rural area.[7]

In addition to the ownership reform processes and the restoration of possessions in Estonia, the status of property owners as a social group was also restored in two

[5] Some articles of this law were used as explanations for implementing the ownership reform principles.

[6] Livonia was a region covering South Estonia and North Latvia.

[7] Webb, A. C (2013) makes similar highlights.

ways. The spectrum of property owners includes a distinct subgroup, the "forced owners." These were persons who became property owners as a result of the restitution and basically as an outcome of the privatization of dwellings. These "forced owners" were listed as owners, but they were not able, for whatever reason, to assume the responsibilities of ownership, i.e., be qualified as owners with the ability to bear the responsibilities of ownership. There exists a second subgroup, the so-called forced tenants, who were living in apartments or houses which were returned to their former owners and who, as a result of the restitution procedures, were not able to take part in the ownership reform and act on the real estate market as persons willing to buy. These two groups are market participants who influence the real estate market and, of course, also the real estate valuation market. Therefore, they have qualities to be categorized as a person willing to buy (WTB) or a person willing to sell (WTS),[8] i.e., potential customers of real estate valuation.

Once again, the historical background of the analyzed process is very noteworthy – in 1991, the buildings, structures, and the growing forest were not connected with the land, as all land was owned by the state. Different buildings and structures had different owners like (i) the state itself, (ii) state enterprises, (iii) local authorities, (iv) collective farms, (v) state farms (sovkhozes), (vi) various forms of cooperation, and (vii) private owners.[9] This separation served as an argument for a privatization arrangement, whereby the first step of the procedure was a valuation of buildings and structures that were managed using the instruments of building cost pricing as well as with the help of some statistical parameters.[10]

For the building cost management, estimated prices of the former Soviet Union were in use, which were dragged to the valuation date by using different coefficients. Some of them with cost-based applications were exported from Germany, as Professor Schmidt, the vice chairman of the Estonian Privatization Agency, had conducted the same process in Germany.[11] In addition, some groups of construction cost coefficients were developed by local engineers, jointly with the unofficial committee under the auspices of the Ministry of the Environment.[12] The parameters developed by this committee varied a lot – from 160 to 280 – which makes the first value estimates very unstable. This convergence was also possible because buildings and structures vs land were not identical objects of the first transactions of the emerging real estate market. This situation was caused by the overall conception of ownership reform positions, while objects of valuation and cost estimation were only buildings and structures, which serve as first objects of the valuation procedure. After this first step, the re-estimated objects moved into the privatization or restitution process. Cost estimation, whereby the costs of buildings and structures were

[8] See also Applied Property Valuation in Europe. A Study of 19 Countries, Master of Science Thesis No.13, *Kungl Tekniska Högskolan*, Stockholm: 1998, 180 pp.

[9] This classification is not definitive.

[10] Official construction market statistics started in Estonia in 1994.

[11] The last decade of the twentieth century, after the reunification of Germany.

[12] The Ministry of the Environment was the government institution leading the process until 2000.

mathematically equal with the proposed market values, or the levelling of costs and market value parameters was proceeded by market participants. It also means that for the first time, the dimension of securities required by the local banking scenery was measured in construction costs, and applied mortgage value was scaled only by the costs of attachments.

This situation changed considerably with the adoption and entry into force of the Law of Property Act in (1993), as well as that of its implementation act, the Land Valuation Act (1994), with its implementing provisions, the Planning and Construction Act[13] (1995) and the Immovable Expropriation Act (1995). Namely, the Land Valuation Act gave in its first chapter, under "§ 3. Basis, purpose, methodology, and types of valuation," a nomenclature of valuation types that should be applied for land valuation as follows:

(3) The sales comparison approach, income approach, cost approach, and combinations thereof are used upon valuation.

In the preamble of this section, it was noted that the good practice and internationally recognized principles of valuation serve as essential parts for the valuation of land as an immovable.

Besides the legal changes that were connected to ongoing changes in the Estonian society and economy, which was converted into a liberal and free market, the situation was significantly affected by the foundation of the Estonian Association of Appraisers.

The Estonian Association of Appraisers (hereafter EAA) was established as a non-profit organization in May 1995 by 30 different specialists, who represented the real estate industry, largely property valuation, as well as some legal bodies such as real estate companies, and local or state authorities, e.g., the Estonian Land Board. During the first years of its existence, the EAA cooperated closely with the International Valuation Standards Council (hereafter IVSC), the associated member of which the EAA was from 1996 to 2008. This associated membership culminated already in the early years of cooperation, when the EAA received a permit to translate and publish the first edition of the International Valuation Standards (IVS), edited and published in 1994 (IVS, 1994). Using the financial support of the Ministry of Economic Affairs, the EAA translated and published the first four parts of the founding IVS international standards into Estonian in 1997 (Rahvusvahelised... 1997). Later during the IVSC membership, some (GN 8, 2000) were also translated and applied.

Simultaneously, from 1997 to 2008, the EAA was an associate member of The European Group of Valuers' Associations (hereafter TEGoVA).[14] The need for this membership was due to the role of TEGoVA in the permanent development of

[13] This act gave the definitions of buildings and structures that are essential parts of real property.

[14] It is intelligible why EAA left these organizations in 2008.

property valuation standards in the European Union.[15] The EAA's membership of TEGoVA peaked in 2005, when the EAA organized TEGoVA's annual meeting in Tallinn. At the same time, the annual meeting of the Baltic Valuation Conference (BVC) took place.

Under the first founding articles, the main objectives of the EAA's activities were (i) development of property valuation as a vocation, a special profession; (ii) development of the methodologies of property valuation; (iii) development of real estate valuation education and training of appraisers; (iv) guaranteeing its members' compliance with the actual requirements of professional ethics; (v) introducing different internationally recognized valuation standards and their methodologies in Estonia; and (vi) awarding professional qualifications to appraisers, organizing professional examinations under the requirements of the Professions Act.

All the mentioned activities can be combined into one fundamental goal for the EAA – assure an international level of real estate valuation professionals whose qualification always corresponds to international standards and who are able to understand and adjust the permanent economic changes, turning them through the valuation process into real estate values.

Based on the association's founding articles, the EAA started the process of attestation of real estate appraisers in 1999. The need for attestation arose from the market, as commercial banks like to have more effective guarantees, and valuation reports were used as the basis for loan decisions and for the scaling of the amount of mortgage. Therefore, the start of the attestation process was managed in cooperation with the Estonian Chamber of Commerce and Industry and with the involvement of the Estonian Banking Association. From the perspective of the real estate market, it is important to underline that the attestation of real estate appraisers and the delivery of certificates, managed by the EAA, was the first professional certification activity in Estonia. The initial attestation and certifications based thereon may be divided into two groups: (i) persons who had the right to appraise only dwellings and single-family homes[16] and (ii) persons who had the right to appraise all types of real estate.[17] The first attestation in spring of 1999 concluded with the issue of the first eight certificates for real estate appraisers and three certificates for dwelling appraisers. The examination process included and currently includes two exams (written and oral), and the EAA is to this day the only body of professional certification who examines persons applying for a profession.

The requirements for appraisers include higher education, work experience in the real estate valuation area, comprehensive knowledge of real estate, and observance of professional ethics. These requirements were developed on the basis of the practical principles and requirements of TEGoVA. The development of educational requirements also included some aspects founded on the principles of HypZert

[15] During the first years of TEGoVA membership, Estonia was not a member state of EU.

[16] Currently named as Real estate appraiser, vocational level VI.

[17] Currently named as Property appraiser, vocational level VII.

GmbH, built on the historical connections of Estonia and Germany, on the one hand, and, on the other hand, on the German impact on the implementation of ownership reform and the development of various legal acts,[18] e.g., the Law of Property Act, Planning and Construction Act, etc. Currently, the basic three pillars on which the appraiser evaluation and classification is based are:

(i) Economics and its macro and micro levels
(ii) Valuation theory combined with standardization
(iii) Legal aspects described by relevant laws and legal acts

For the purposes of attestation and certification, the EAA created the Professions Qualifications Committee as well as the Examination Committee working under the former's auspices, currently named the Evaluation Committee.[19] The goal of the Professional Qualifications Committee is to develop and check the professional skills of appraisers and, in cooperation with the Evaluation Committee, organize and carry out the awarding of professional qualifications to appraisers via the organization of professional exams. These two committees are also responsible for the concordance of the process with the permanently changing theoretical and legal aspects of valuation, not only in Estonia but also on the EU[20] level. One of the basic tasks of the Evaluation Committee, besides carrying out professional examinations, is the arrangement of audits of professional appraisers. Auditing of real estate appraisers on all levels started in 2003, when the Regulation of Audit Implementation and the Order of Professional Appraisers Reports entered into force. In the beginning, the auditing process was carried out once every 5 years; currently, the required frequency is once in 2 years.

At that time, another agency of certification existed and still exists today – the Estonian Land Board, which has the right, based on the Land Valuation Act, to examine and subsequently issue certificates to the valuers who are involved in the land valuation process. In this case, under the direction of its CEO Mr. Tiits, the "unofficial father" of real estate valuation in Estonia, the EAA carried out remarkable work with many government bodies. This work showed results in 2008, when the previous procedure for licensing land valuation professionals was changed. With the new procedure, the real estate valuers who have the highest vocational level (seventh level) also have the right to assess land,[21] and the previous duplicated examination system has become history.

[18] Many legal acts include at least some translated principles from corresponding German laws and legal acts.

[19] These different changes arise from the adoption of EU laws and bylaws.

[20] For example, the changes in valuation environment linked with the enforcement of Directive 2014/17/EU of the European Parliament and of the Council of 4 February 2014 on credit agreements for consumers relating to residential immovable property and amending Directives 2008/48/EC and 2013/36/EU and Regulation (EU) No 1093/2010 (1) and the related Estonian legislation in the Creditors and Credit Intermediaries Act (2015).

[21] This permission extended to ordinary and extraordinary land valuation procedures.

In another context, Professor Mike Hoxley[22] said that "every surveyor must have a least one lawsuit during his career" (Hoxley, 2009). It was not only for this reason that the EAA founded a Court of Honor with the authority to investigate and discuss possible violations of professional ethics by members of the EAA. Currently, Estonian valuation standards state that "every person involved in the valuation procedure must follow valuation standards," making it obligatory for everybody without membership in the EAA to follow valuation standards; the Court may investigate and discuss potential violations of professional ethics by professional valuers who are not members of the EAA if this has been requested by the Professional Qualifications Committee. The Court of Honor also gives its opinion on (i) methodological, (ii) theoretical, and (iii) ethical aspects of disputed expert opinions that advance the role of the Court as an interpreter of previous standardized situations.

When generalizing the Estonian real estate valuation environment, it is possible to distinguish three basic approaches – the main routes of the development of the procedure. These directions are:

(i) Further development of standards
(ii) Conformity of the valuator's knowledge with current trends of theoretical developments and legal understandings
(iii) Deeper connection of higher education with professional requirements

Valuation Standards Under the overall standardization process, which corresponds to the principles of the International Organization for Standardization and to the practice that is in use in all countries of the European Union, the standardization procedure in Estonia intends that the standards have a life cycle of 5 years. In addition, the standards may be international or European, adopted and translated, furnished with national appendixes, or not translated, i.e., originally in Estonian and listed in the Estonian register of standards.

The main position in the register is held by the national and original, specialty-based standards. The real estate valuation standards developed under the leadership of the EAA can be placed into this group. It is significant that the development of valuation standards is included by the Ministry of Economic Affairs and Communications in the annual standardization plan and thereby financed from the state budget. As the standardized valuation procedure started from the translation of the first edition of the International Valuation Standards, dedicated to the problems of property valuation, the package is named "Property valuation," marked as the series "EVS 875 Property valuation (2005–2018)." Under this program, the EAA, in close cooperation with the Standardization Working Group, which has been supervised

[22]Mike Hoxley was a professor at Nottingham Trent University and an editor of the journal *Structural Survey*.

Table 9.1 Links between Estonian valuation standards and IVS

Estonian standards	International Valuation Standards
EVS 875-1 (2005) Valuation Concepts and Principles	General Valuation Concepts and Principles
EVS 875-2 Types of Properties	Property Types
EVS 875-3 Valuation Bases	Introduction to International Valuation Standards 1, 2, and 3; IVS 2 – Valuation Bases Other Than Market Value
EVS 875-4 Code of Conduct and Valuation Reporting	Code of Conduct; IVS 3 – Valuation Reporting; Code of Ethical Principles for Professional Valuers
EVS 875-5 Valuation for Financial Reporting	IVS 1 – Market Value Basis of Valuation; International Valuation Application 1 Valuation for Financial Reporting (Adopted 2003)
EVS 875-6 Valuation for Lending Purposes	IVA 2. Valuation for Lending Purposes; IVGN 3. Valuation of Plant and Equipment; IVGN 4. Valuation of Intangible Assets; IVGN 6. Business Valuation
EVS 875-7 Reviewing of Valuations	IVGN 11. Reviewing Valuations; A Guide to the Audit Process for Professional Valuers
EVS 875-8 Cost Approach	IVGN 8. Depreciated Replacement Cost; TIP 2 The Cost Approach for Tangible Assets
EVS 875-9 Income Approach	IVGN 9. Discounted Cash Flow Analysis for Market- and Non-market-Based Valuations; TIP1 Discounted Cash Flow
EVS 875-10 Data Collection and Analysis, Property Inspection	Direct bases are absent
EVS 875-11 Sales Comparison Approach	Direct bases are absent
EVS 875-12 Valuation for Compensation	Direct bases are absent
EVS 875-13 Consideration of Environmental Risks, Land Use Restrictions, and Nature Protection in Property Valuation	IVGN 7. Consideration of Hazardous and Toxic Substances in Valuation

during the entire period of standardization by Professor Kolbre,[23] has done a remarkable job in the area of standardization of the valuation process and served as an example for other professional bodies and institutions. The list of valid Estonian valuation standards with links to IVS and their topics is given in Table 9.1.

The importance of standards and their influence on the accuracy of real estate valuation reports, the real estate valuation procedure, and the adequacy of appraised and estimated values are an amalgam of different analyses, e.g., those concluded by Ilsjan, 2003; Kolbre & Kask, 2001; Kask et al., 2017, etc. Also, it is important that

[23] Mrs. Ene Kolbre is professor emeritus of TalTech (former Tallinn University of Technology) and a cofounder of EAA.

current changes in national standards will include the last theoretical changes of European Valuation Standards (EVS, 2016)[24] and International Valuation Standrds (IVS, 2017).[25]

Economic Cycle and Real Estate Valuation

As mentioned in the second subdivision of the chapter, real estate valuation was a part of the reorganization of the economy when it shifted from planned economy into market economy. In the Estonian context, it was not only a shift to market economy but also a turn to a liberal market economy.[26]

Therefore, the development of the economy and the real estate market as an elemental, materialized part of it, including the valuation procedure, began in the context that accounts for the cyclical behavior of economy. According to evidence-based analyses of the influences of economic cycles, it can be stated that the real estate market is also cyclical and that its cycles are in correlation with overall economic cycles and behavior (Angerma, 2005; Paabut & Kattai, 2007; Varblane et al., 2009). In addition, some politically important events and their dates, such as the membership in NATO, membership in the EU, or two monetary reforms, play a huge role in this process. The current environment of valuation procedures is the result of the first edition of IVS, translated and published in 1997, which, combined with professional certification, led to the release of permanent national valuation standards, which began in 2005.

In fact, the majority of the valuation reports are addressed to the housing sector, i.e., apartments and/or single-family houses, which, like other real estate sectors, in turn reflects the behavior of the construction industry and the overall health of the economy. Indeed, as the interconnected sectors or the economy as a whole are rapt by the market cycle, the increased influence of the cycles is unavoidable. The position of valuation reports, as well as the valuation process itself, was described in 2010 in a presentation prepared for the EAA's annual meeting, which presented information explaining the nature of the real estate valuation market. In the presentation, it was stated that valuation reports for housing loans account for approximately 80% of all reports and, vice versa, the amount of summarized values in money of these reports is around 20% of the summarized value of all appraised properties. In addition, it was explained that 20% of involved appraisers are conducting 80% of realized valuation procedures.[27]

[24] Basically the approach to the hope value, EVS 2016, pp. 25–26.

[25] Primarily the cyclical nature of valued assets, while income approach is in use and we deal with terminal value.

[26] As evidenced by the fact that in 2002 former prime minister of Estonia Mr. Mart Laar received The Milton Friedman Prize for Advancing Liberty awarded by the Cato Institute (USA) and it was associated with ownership and economic reforms.

[27] As is often possible to monitor, the Pareto principle works fully.

Moving closer to the economic analysis or to cycle influence analysis as well as its overall reflection on the real estate market, including the gleanings on the real estate valuation market, it is important to draw some connections between their different attributes. In this case, linked with legal direction by Haydaroğlu (2015), Feng et al. (2010), Powell (2002), Miller (2008), and Besley and Ghatak (2010), we have established the necessity to imagine and understand why and how a connection exists between property rights[28] and economic growth and which way it should be accounted for when dealing with cycles.

Moreover, different authors have moved forward and made various connections between cycles and different types and subsectors of the real estate market. Besides Scott (Scott & Judge, 2000) and Baum (2001), who pay attention to the office market, other authors (White, 2015; Żelazowski, 2017; Aizenman et al., 2016; André, 2009) have illustrated the superposition of the housing market tied with economic policies and business cycles.[29] When real estate sector-based economic influences are under discussion, it is possible to either follow positions that observe all three Baltic States or survey the situation in Estonia separately.

In the context of the Baltic States, which serve as a regionally defined example, and moreover linked with Estonia, we may quote very many studies that describe the position of housing in the context of economic development and market cycles. Some authors, such as Erixon, 2010, Geipele & Linda, 2013; Jadevicius & Parsa, 2014; Kauškale & Geipele, 2016, have made more generalized analyses, or their work is linked with Latvia or Lithuania. Other authors, e.g., Hendrikson et al., 1997, Varblane et al., 2009, Brixiova et al., 2009a, b., Kallakmaa-Kapsta, 2013, Eliste, 2015, Aus et al., 2015; Room & Merikull, 2017, have analyzed housing loans, GDP, the links of real estate valuation number or total value with dwelling values, etc., managing it exactly from the viewpoint of Estonia.

By combining the findings of the aforementioned authors, it is possible to compile a list of basic market sectors as well as economy-based and/or business cycle-based connections where, as a result of movement, one of them pulls the others into movement. Such movements suggest that between their movements, there exist a chronological and temporal gap and a time lag, which results in their different start and finish times as well as their different pulses while measurement is carried out.

In their work "Praxishandbuch. Immobilienzyklen," Nico Rottke and Marten Wernecke (2006) presented a scheme of real estate cycle influencers that visually summarized the basic economy-based influences (Fig. 9.2).

For a better explanation of the appearance of different factors, it is useful to construct a timeline of their implementation, sorting them into two groups as real estate valuation procedure influencers: (i) legal agents, changing the legal environment, and (ii) economic agents, changing the environment of the economy. Thus,

[28] Postulate: The real property which is not listed is not a real property.

[29] Already in 1996, DiPasquale and Wheaton explained the relative importance of housing stock in the overall real estate stock of the USA, which was 69.8% (DiPasquale & Wheaton, 1996) – this clearly underlines the importance of housing sectors.

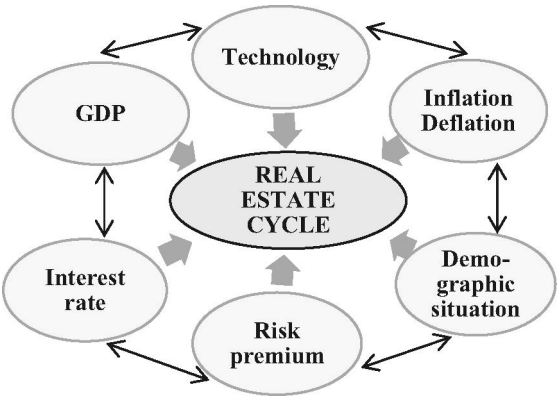


Fig. 9.2 Real estate cycle and its influencers. (Source: Rottke, B. Nico, Wernecke, Martin. Praxishandbuch. Immobilienzyklen, own adaption)

two groups of market value factors are preliminarily described, and it is explicable that both these groups contain some of the basic aggregates of value, such as land, capital, entrepreneurship, etc. Hence, by assembling them with the help of information technology, as mentioned by Timothy Dixon and Bob Thompson (Dixon et al., 2005) in "Real estate and new economy...," the ground for deeper and more precise descriptions is created.

Also, this grouping into two describes in its own way the nature of value's origins, as the legal instruments through their changes have an effect on the origins of real estate value, like (i) desire, (ii) utility, (iii) scarcity, or (iv) purchasing power. The lastly named "purchasing power" describes in a faster and easier way how the economic and real estate market factors are jointly spotlighting the changes of the market (Boone, 2007; Eliste, 2015) (Table 9.2).

The connection between property rights and economy established hereinbefore makes it possible to outline some diverse ways of how the different agents and their base markers have influenced and are influencing the market situation observed from the perspective of the real estate market, as the majority of this chapter is from the perspective of real estate valuation. Similar to the legal influencers, it is also possible to provide a deeper clarification of economic aspects and to implement relevant monitoring of the underlying economic aspects, since they have an effect on the real estate market, described by the real estate valuation market.

Returning to the previously mentioned economy-based influencers and their influence on the real estate market and real estate valuation procedure and cyclicity, it is appropriate to look at the research done by Eliste (2015) and Aus et al. (2015). In his work, Eliste gave two applications that explain the relationship of GDP, average salary, and the number of real estate transactions in 2000–2014 and the connection between salary and the number of real estate transactions (Fig. 9.3).

Aus et al. (2015) finalized their research with the comparison of average square meter price (in euros) and transaction number in the Estonian apartment market between 2003 and 2014, using half-year periods. Based on the research, the authors drew a honeycomb that describes how the market prices grow and how they turn

Table 9.2 Legal, political, and economic drivers of the real estate market

Year	Economic or legal or political activity	Influence	
		Legal	Economic
1991	Ownership reform	++	+
	Restoration of independence	++	+
	Land Reform Act	++	+
1992	Money reform	+	++
1993	Land valuation law and its decrees	+	++
	Property Law	+	++
	Privatization of Dwellings Act	+	++
1995	Foundation of EAA	+	+
	Planning and construction law	+	++
	Immovables Expropriation Act	+	++
1997	Mergers of commercial banks	–	+
	Black Friday	–	++
	EAA membership in IVSC	+	+
	EAA membership in TEGoVA	+	+
1999	EAA began attestation and certification	–	+
2000	Amendment of the Income Tax Act	+	++
2001	Terrorist attack in the USA	–	+
2002	Professions Act	+	++
	Certification of valuators as professionals	–	+
	Law of Obligations Act	+	++
	Civil Law	++	+
2003	NATO membership signing	–	+
	Transition to the legal system harmonized with the legal basis of the EU	+	+
2004	**EU membership started on 1 May 2004**	+	++
2005	Amendment of the Value-Added Tax Act[1]	+	++
	Standardization of property valuation	–	+
2007	Global economic crisis started	–	+
2008	Professions Act under EU bylaws	–	+
	EAA enforced new regulations of certification	–	+
	Bankruptcy of Lehman Brothers Holdings Inc.	–	+
	Global economic crisis arrived in Estonia	–	+
	EAA ended membership in IVSC	–	+
	EAA ended membership in TEGoVA	–	+
2010	First valuation standards were reedited	–	+
2011	Money reform – EEK conversion into EUR	+	+
	First step of the standardization circle was finished	–	+
2016	Creditors and Credit Intermediaries Act	+	+
	Regulation of the appraisal procedure of state assets and its expert assessment form	+	++
2017	Decree of Creditors and Credit Intermediaries Act (Ministry of Finance)	+	++

(continued)

Table 9.2 (continued)

Year	Economic or legal or political activity	Influence	
		Legal	Economic
	Estonian Presidency of the EU	–	++
2018	Real estate coordination committee of Professions Coordination Council confirmed EAA's right to certify appraisers for the next 5 years	–	++
	Amendment of the Immovable Expropriation Act	+	++
	The EU regulation GDPR	+	–

Edition of EVS 875-13 Consideration of Environmental Risks, Land Use Restrictions, and Nature Protection in Property Valuation

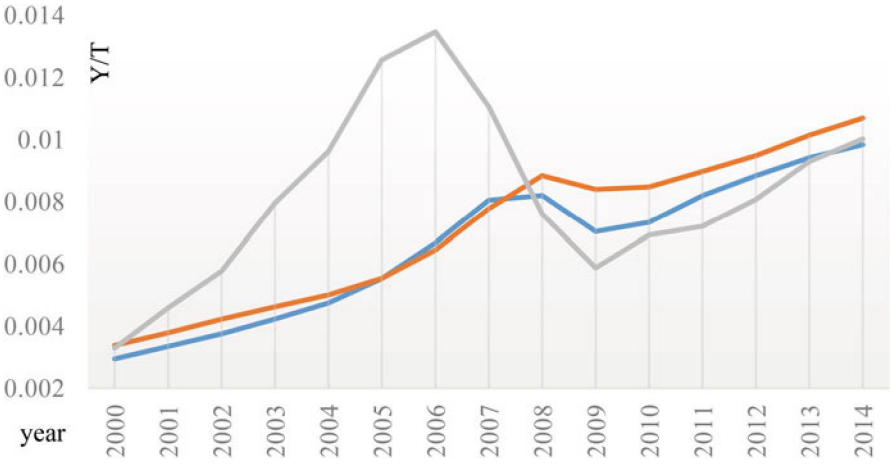


Fig. 9.3 Correlation of GDP, salary, and the number of transactions. (Source: Eliste, 2015). Legend: GDP, blue line; salary, brown line; transactions, gray line

downward before they start to rise again and how this is linked with the number of transactions (Fig. 9.4).

On the other hand, these indicators, primarily the number of transactions, are in correlation with the number of completed valuation reports, as each transaction on the housing market is generally loan-based and "loan-based" means a valuation report in practically every case. Room and Merikull, who also research household behavior, noticed in reference to the real estate prices that price changes increased loan-to-value ratio and the number of households with negative equity as well. One of the reasons for the aforementioned changes is the recently accumulated mortgage stock as well as the slow recovery of the previous level of market prices[30] (in the housing sector).

[30] The pre-crisis level of housing prices was obtained only in 2017, after which it is possible to note the booming growth thereof.

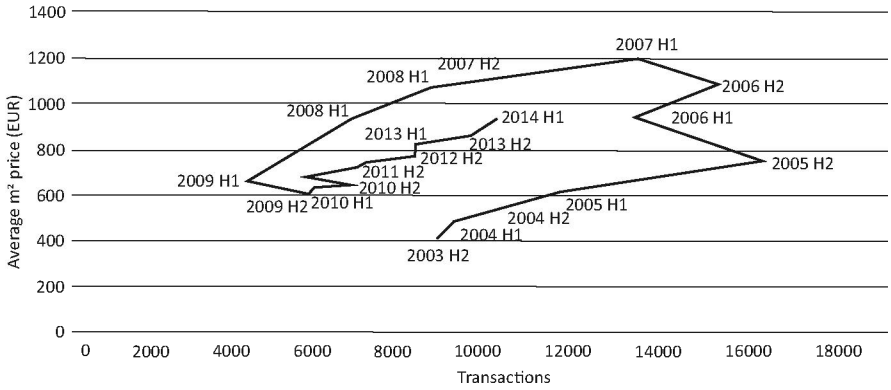


Fig. 9.4 Average sq. m price (in euros) and transaction number in the Estonian apartment market between 2003 and 2014, in half-year periods. (Source: Aus et al., 2015)

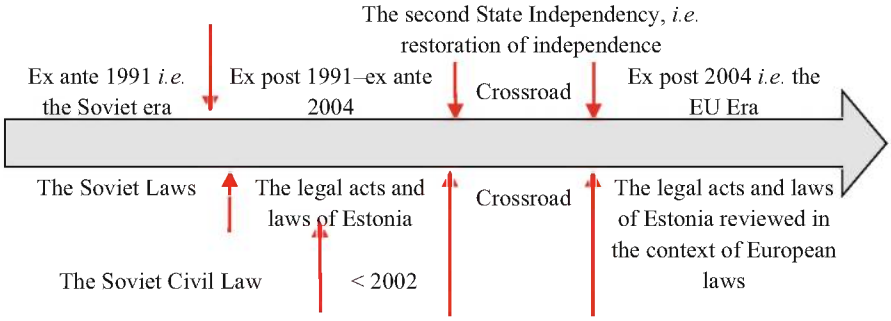


Fig. 9.5 Legal environment framework. (Source: Own presentation, adapted from Torop & Sahk, 2004)

Other authors – Kattel and Juuse (2014), Kattai (2010), Friedrich and Reiljan (2015), etc. – have noticed that the cycles primarily influence Estonian export, the production sector, and the construction sector, which is one straightforward partner of the real estate market. Besides the other factors and attributes, it is once again possible to underline the influence of one of the origins of value, i.e., purchasing power, which, in correlation with salary, describes market behavior and its nature under the cycle's pressure more effectively.

The legal agents and influencers of the overall legal environment that are changing the market cycle have been shortly described prior to this subdivision, but an overview of the most important of them helps to understand how the Estonian real estate market as well as its submarket – the market of real estate valuation – is placed under legal control (Fig. 9.5).

An assessment of the current influence of EU legislation on the national legal system, and thereby how the aforementioned influences are transferred into the

economic climate and whether or not they are linked with the fluctuations and cycles of economy, requires a brief analysis of EU legislation.

In the introduction of EU directive 2014/17/EU (EU, 2014), it is stated that Member States of the EU should ensure that (i) reliable valuation standards are in place on their territories and (ii) these standards take into account internationally recognized valuation standards, in particular those developed by the International Valuation Standards Committee, the European Group of Valuers' Associations, or the Royal Institution of Chartered Surveyors, the well-known Britain institution.

In fact, this requires financial institutions, not only banks, who are linked with crediting of housing to arrange "in-house" standardized valuation processes. The question of how to control the "in-house" procedure of lending institutions is more than delicate, as the door for controlling is closed with the lock of the bank's confidentiality and secrecy.[31] The European lawmakers mention in the Directive that, besides the standards, there is a possible basis for valuation adequacy in legal acts, local law, and self-regulation, which will be considered as approaches. When analyzing this concession, it is possible to argue that those EU Member States where the valuation process is legally regulated can more easily follow contemporary requirements arising from the Directive, indicating thereby that Estonia does not have a strong legal basis in this area.

Returning to self-regulation as an approach, as regards the arrangement of the valuation procedure, it is imperative to discuss whether the national standards are part of the self-regulation or not. Taking into account the durability of Estonian property valuation standards in the context of restored independence, it becomes evident that the standards from the series EVS 875 are precisely the self-regulation that in accordance with the overall professional certification and auditing system is mentioned, but not defined in the Directive. In Directive 2014/17/EU of 4 February 2014, the European Parliament and the Council of the European Union have stipulated that it is very important for all EU Member States to guarantee a situation where all lending institutions furnish the loan space with property reports prepared by appraisers who are satisfying the requirements arising from international valuation standards.

The European Parliament and Council provided in Regulation No 575/2013 of 23 June 2013 (EU, 2013) the prudential requirements for credit institutions and investment firms and thereby supplied the real estate valuation market with three adjusted and actual definitions: (i) mortgage lending value, (ii) residential property, and (iii) market value. Returning to the nature of these definitions provided in the regulation, it is immediately evident that, without taking into account the order of words, the definition of the term "market value" is the common and previously used definition. The other two definitions are familiar for most real estate valuation market specialists, but by being listed in the regulation, they now have an official meaning.

[31] For this reason, it is also practically impossible to place appraisers who are working in banks under real estate appraiser auditing regulations.

It is also evident that the explanation of the term "mortgage lending value" serves mainly two basic purposes, i.e., to guarantee for lenders, primarily residential property market clients, that the ratio between the mortgage amount and the market value of the property used as security meets the market's need also when the market and thereby also the prices and values are decreasing. The second reason relates to the real estate market's need for stability and must ensure to the commercial banks and other lending institutions who are involved in "home loan emission" that, regardless of the fall of market values, their financial stability is more or less guaranteed, as the loan itself is furnished with the security, the value of which is lower and/or commonly equal to the mortgage value.

It is also remarkable that in the regulation, a legal definition of the term "residential property" is officially formulated for real estate appraisers – "a residence which is occupied by the owner or the lessee of the residence." The notation of the meaning of the term "residential property" armed the current chapter with a clear definition so that further research can be more specific and definitive in its details.

Conclusions

In summarizing the chapter, it is possible to underline that:

The housing market and its statistical interpretations, e.g., the number of sales or the volume of total sales, price per sq. m aggregated with economic parameters like GDP, medium salary, etc., allow with adequate soundness to explain how the cycle is influencing the real estate market and its submarket – the real estate valuation market.

In spite of the turbulent market, the number of transactions, and the total value thereof, the fluctuation of these parameters is synchronous. The housing loan interest curve describes the opposite movement to the curves of the value market.

In spite of the influence of cycles on the economy overall, the influences on the real estate market caused by cycles are lagged, and their caps are different.

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Part II
Problems and Solutions

Chapter 10
Thinking Out the Box



Maurizio d'Amato and Esra Alp Coskun

We cannot solve our problems with the same thinking we used when we created them

Albert Einstein

Abstract Being aware of the importance and the relevance of property market cycle from social and economic points of views the second parts is dedicated to providing solutions. The contribution is an overview and an introduction to the contributions in the second part of the book mainly focused on providing solutions.

Key words Property valuation methods · Market cycle

In this part, our attention is shifted on the valuation process. The selection of a valuation methodology may contribute to uncertainty in the valuation process according to the International Valuation Standards (IVS) Committee (IVSC, TIP n. 4 Valuation Uncertainty, para 12.4). Therefore, the question raised is how to deal with the property market cycle, as a clear sign of uncertainty, during the valuation process. This question is not new. One of the first authors addressing this problem was Kazdin (1944). But more recently, there have been several different contributions highlighting the methodological dimension of the property market cycle. The unrealistic nature of direct capitalization approach assuming a constant rent has been highlighted by Born and Pyhrr (1990) and Bow and Pyhrr (1994), among others. A further concern is about direct capitalization that is procyclical in its current form

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(DeLisle & Grissom, 2011). As the very quick policy response to global financial crisis, the IVS introduced the definition of cyclical assets. Such definition has been confirmed also in the recent IVS 2020 edition (IVS, 2020, General Standards – IVS 105 Valuation Approaches and Methods, para 50.21 letter e). Although this class of assets has no precise academic definition in property valuation theoretical literature, they may be referred to as property assets showing an extreme return volatility during cyclical shifts in different market periods (d'Amato et al., 2019). This part offers different alternatives to the valuation process.

The part is composed of eight contributions. The first one is an important analysis of the role of the property market cycle from the perspective of regulatory responses. This paper introduces the reader to the role of the difficulties to deal with the property market cycle. In the following contributions, d'Amato and Coskun raise the attention on the importance of property market cycle in the valuation process providing an overview of the main valuation problems directly connected with property market cycle. Possible methodological solutions are offered in the third, fourth and fifth contributions to this part. In the third contribution, d'Amato et al. investigate a group of income approach methodologies called cyclical capitalization. This is a growing family of methodologies able to integrate property market cycle in the valuation process (d'Amato, 2015, 2017a, b; d'Amato & Amoruso, 2018) integrating property valuation with property market cycle. In the fourth contribution, Artmemenkov and Michaletz introduce the reader to TAPA modelling (Michaletz & Artemenkov, 2019; Constantino et al., 2009) providing also interesting future directions of research. Meier and Herath offer an overview on how automated valuation modelling may handle cyclicality. In his chapter, Mooya moves the discussion on theoretical level demonstrating the inconsistencies of the conventional economics whilst dealing with bubbles. Furthermore, he shows the important role of valuers and how they influence transaction though their valuation activity. Finally, d'Amato provides four cyclical capitalization models that may be useful to deal with specific market condition. They represent the extended cyclical capitalization.

Overall, this part offers methodological and theoretical contributions for the current cyclical valuation problems. Suggested solutions may represent a possible starting point that may be improved with further methodological and practical contributions. This part develops a framework helping to integrate the impacts of property market cycle into property valuation at all scales.

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Chapter 11
Regulatory Responses to Property Cycles



Richard Grover

Abstract After each major cyclical downturn, the cry tends to go up that this must never be allowed to happen again. Lessons must be learnt from past failures, and measures must be put in place to ensure that there is no repetition. As usually the property market is identified as a major contributor to unsustainable booms and the inevitable slumps that result, it is often one of the focuses of new regulation, which is primarily achieved through influencing the amount of lending on property made by the financial sector. The chapter traces the main property cycles and the national and international regulatory responses that market slumps and crashes provoked. In particular, the crash of 1974 resulted in important changes to the ways that secondary bank lending on property was regulated and to the creation of valuation standards. Policies of financial liberalisation and deregulation with light touch regulation pursued after 1980 appeared initially to function effectively, but the financial crisis of 2008 called into question this approach and has resulted in tighter regulation of banks and lending to the property sector. The problem regulators face is that property sector has the ability to absorb funds at times when deposits are growing rapidly, and financial institutions are forced to chase creditworthy borrowers or face downward pressure on yields. Yet financial institutions have less knowledge about the property market and individual projects than borrowers. Borrowers are able to default on loans with relatively little recourse available to financial institutions, so this asymmetrical information puts them at risk of losses. The chapter examines how effective regulatory responses to property cycles have been and whether and to what the extent property cycles are driven by forces that make them almost impossible to regulate. Central to this is the question of whether the infinite capacity for innovation in the financial sector, globalisation and international financial arbitrage and the ability of financiers to create institutions that are able to evade regulation mean that regulators are constantly having to play catch-up. Regulators therefore may approach the next cycle perfectly equipped with the policies to tackle the previous

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one but having to confront financial innovations that challenge their abilities to respond.

Keywords Financial regulation · Financial innovation · Valuation standards · Financial liberalisation and deregulation · Basel Committee · Shadow banks

Introduction

The Nobel laureate Robert J Shiller (2000) has argued that one of the factors that reinforce speculative bubbles is accounts that contend that the economy has moved into a "new era" that makes it impervious to forces that have operated in the past on the downside. Therefore, the argument goes, this time things will be different. That such arguments are put forwards reflects, at least in part, the fact that after each major cyclical downturn, the cry tends to go up that this must never be allowed to happen again. Lessons must be learnt from past failures. Measures must be put in place to ensure that there is no repetition. As usually the property market is identified as a major contributor to unsustainable booms and the inevitable slumps that result, it is often one of the focuses of new regulation. Although command economy can directly regulate property development through controls over investment and building materials, for competitive economies, regulation can primarily be achieved through influencing the amount of lending on property made by the financial sector.

Major cyclical slumps have instigated regulatory responses and policy changes as policymakers – both at national and international levels – seek to learn from past experiences in an attempt to prevent their reoccurrence. Such activity has meant that it is true to say, in one sense, that the economy does move into a new era with each cycle and so that this time it will be different. The regulatory environment in which a particular cycle takes place may have changed materially from that in place during the last one. This chapter explores the attempts to regulate away cyclical activity in the property market. Such regulatory responses can be regarded as genuine attempts to address problems that slumps have highlighted. Yet the cyclical pattern of booms and slumps continues to reoccur. This raises questions about the effectiveness of regulatory responses to past cycles and whether the forces that lie behind market cycles are inherently incapable of regulation. Implicit in this question is whether the financial sector can be regulated effectively so that it does not pump funds into real estate when the market is overheating, excess supply is likely to result, and borrowers are likely to experience problems in repaying loans.

The chapter tends to focus on the policy responses in the UK. The UK is one of the world's largest economies and is heavily dependent on financial services. It has a highly transparent property market that is open to foreign investment in both the commercial and residential sectors. British policymakers have been particularly active in the international arena and have often been successful in persuading world forums to adopt policies based at least in part on what has been found to be effective in the UK. The major recessions since 1970 have resulted in significant regulatory changes affecting both the property and financial markets. Not all cycles

impact countries equally. For instance, the UK was relatively unaffected by Asian banking crisis of 1997 but was particularly affected by the fallout from the creation of the EU's Exchange Rate Mechanism, the forerunner of the euro.

The chapter examines how effective the regulatory responses have been and the extent to which property cycles are driven by forces that make them almost impossible to regulate. Central to this is the question of whether the infinite capacity for innovation in the financial sector and its ability to create institutions that are able to evade regulation mean that regulators inevitably approach the next cycle perfectly equipped with the policies to tackle the previous one, but having to confront financial innovations that challenge their abilities to respond.

Cycles in the UK Property Market

It is only since the 1970s that accurate data on property prices and yields has been available for commercial property in the UK. Given the complexity of property cycles and the possibility that several cycles of different durations might overlay each other, this is a very short run of data to analyse (Jadevicius & Huston, 2014). Moreover the process of establishing the collection of such data is still a work in progress in many markets. Access to commercial property tends to be by renting it. Consequently land registries tend not to collect rental data as there is no requirement to register short leases. In the UK the collection of market data was stimulated by growing interest in the Capital Assets Pricing Model and the demand by major investors for an index for property that could be compared with those for shares. This resulted in the creation of Investors Property Databank (IPD) in 1985, with the index being extended through back casting to the 1970s. Commercial property indexes tend to be more reliant on valuations rather than actual transaction prices. A further complication is the multitude of different methods used in the compilation of the indexes, including using transactions data, repeat sales and hedonic approaches (Grover & Grover, 2012).

Obtaining data for the analysis of cycles in residential property is simpler than for commercial property. In markets in which owner occupation is the dominate tenure, access to accommodation is typically secured through purchase. There should therefore be evidence of house prices, through prices declared by purchasers when they come to register property transfers and/or when valuations are carried out for mortgages. There are longer series of data on house prices than for commercial property. However, the residential price indexes available use different methods which means that they are not strictly comparable (Grover & Grover, 2013a, b, 2014a). The residential property indexes for the UK with the longest data sets are those produced by the Nationwide Building Society and Lloyds Banking Group (formerly the Halifax House Price Index). Both series adopted hedonic methods during the 1980s, but this means that there is not, strictly, a consistent method applied throughout the whole series. In any case the different methodologies each has adopted mean that there is not consistency in the rates of change or the timing of

directions of change between the indexes, even though in broad terms they show similar trends. Bearing these caveats in mind, it is possible to use the residential price indexes to plot the broad trends in property cycles and to use them to explore the policy responses to the resulting slumps.

Figure 11.1 shows trends in house prices in the UK taken from the Nationwide House Price Index. Commercial property cycles tend to have followed a similar trajectory to the residential ones. The diagram shows the annual changes in house prices compared with the equivalent quarter of the previous year. It identifies four major property crashes in the UK during the past 40 years: 1974, 1979–1980, 1989–1990 and 2008. Of these, the ones in 1979–1980 and 1989–1990 can be argued to be the result of domestic economy policy, with the other two reflecting impact international events.

The Property Market Crash of 1974 and Its Aftermath

The crash of 1974 followed 3 years of exceptionally rapid increases in property prices. It came about as the government applied deflationary economic policies to combat the major balance of payments deficit that had risen as the result of the OPEC cartel increases in oil prices. Inflation reached 24% in 1975. Rates of return in the economy in the early 1970s were stagnant, and the property sector offered the potential for enhanced rewards (Bank of England, 1978). The increase in house prices was accompanied by rapid increases in non-residential property prices, with offices estimated to have increased in price during the period 1971–1973 by 247%, shops by 84%, industrial premises by 31% and agricultural land by 130% (Neuburger & Nichol, 1976). The shock of the 1974 crash was all the more significant as nothing like it had been experienced in the recent past and spurred enquiries as to how the boom and bust had come about. Initially the banking sector, and in particular building societies (mutual savings banks specialising in residential mortgage finance), was blamed for fuelling an unsustainable boom. Subsequently it was recognised that rising incomes had increased deposits with banks and building societies, which had, in turn, led to increases in lending as they funnelled the growth in deposits into the property market. There had also been growth in deposit-taking institutions, which were not designated banks and therefore did not come within the Bank of England's regulatory controls over the banking system.

The British government sought to control the growth in property prices in 1972 and 1973 by relying on directives to banks. On 7 August 1972, the Governor of the Bank of England sent a letter to the banking system noting that demand from industry for bank finance was growing and that banks should "as necessary make credit less readily available to property companies and for financial transactions not associated with the maintenance and expansion of industry" (*Bank of England Quarterly Bulletin*, 1972, Q3, p. 327). Again, on 11 September 1973, the Governor called for further restraint by the banks on lending for property development (*Bank of England Quarterly Bulletin*, 1973 Q4, p. 445). On 12 November 1974, the

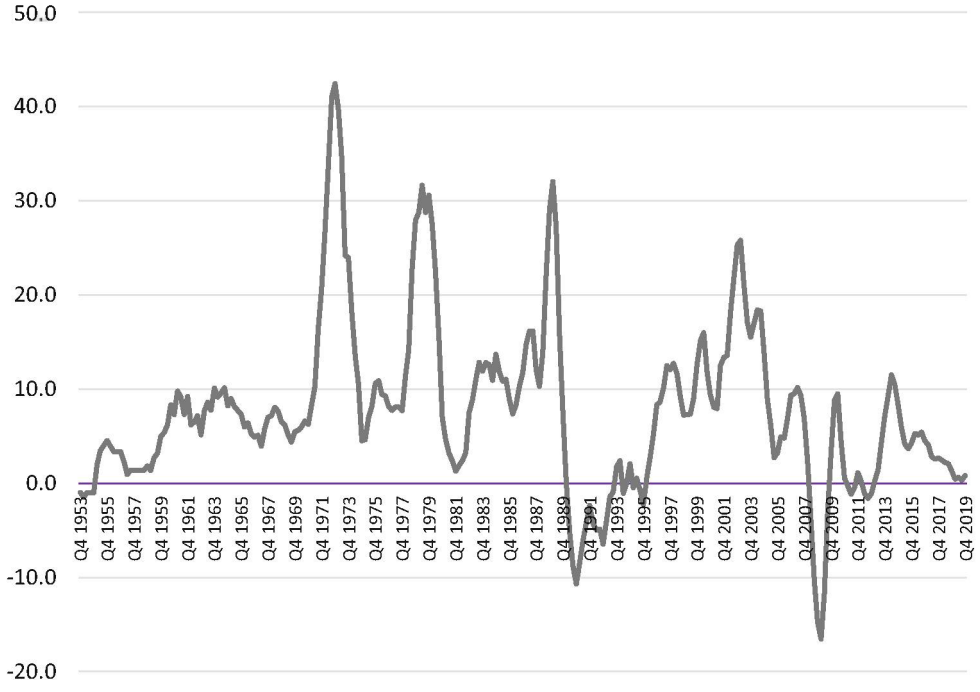


Fig. 11.1 Annual changes in UK house prices 1953–2019. (Source: Nationwide Building Society, https://www.nationwide.co.uk/about/house-price-index/download-data#xtab:uk-series)

Governor asked the banking sector to continue to exercise restraint in their lending to the property companies "as strongly as is compatible with avoiding aggravation of the present difficulties of such companies" (*Bank of England Quarterly Bulletin*, 1974, Q4, p. 420).

The Bank of England used its minimum lending rate to increase interest rates in the economy and restricted the interest-bearing deposits that banks could accept in an attempt to control lending. Minimum lending rate was raised to 11.5% in July 1973 and to 13% in November, and banks were required to make special deposits with the Bank of England. In September 1973, banks and building societies were restricted to paying no more than 9.5% on deposits of £10,000 or more to limit "round tripping" under which companies drew down overdraft facilities and placed the funds on deposit elsewhere within the banking sector. A system of supplementary special deposits was introduced in December 1973 which banks whose growth of interest bearing deposits exceeded set limits were obliged to contribute. Monetary policy was further tightened during 1974 with banks having limits placed upon the growth of interest-bearing deposits of 1.5% per month. During 1974 company profits came under strain. By the end of 1975, the Bank of England was becoming concerned about the capital adequacy of banks and began working on the development of new regime. On 28 February 1975, the Bank of England removed supplementary special deposits and restrictions on interest rates on deposits paying more than 9.5% (*Bank of England Quarterly Bulletin*, 1975 Q1, p. 40), but the advice to restrain lending to property companies remained in force.

The crash started with the collapse of London and County Securities, a quoted company but a non-bank deposit-taking institution, which in November 1973 was unable renew deposits (Bank of England, 1978). The nadir was the collapse of the Stern Group, a property company, in June 1974. The subsequent fall in commercial property prices resulted in a crisis in the secondary banking sector, with a number of deposit-taking institutions dependent on wholesale finance floundering or requiring support from the Bank of England as the value of the collateral they had taken collapsed and liquidity was withdrawn (Bank of England, 1978). The Bank of England was concerned about the risk of contagion in the market, particularly as depositors feared the collapse of more secondary finance institutions. The regulated banks themselves seemed secure as they benefitted from a flight of deposits to them. The Bank of England established what it termed the "lifeboat". The secondary institutions in difficulty were identified, and a lead bank commissioned to investigate them on behalf of a Control Committee of the Bank of England and the leading banks. Liquidity was funnelled into these institutions at the inter-bank interest rate plus a margin for risk. In all 26 institutions received assistance (Bank of England, 1978). Ultimately the risk fell on the Bank of England as the regulated banks took the view that they could not take this on. Failure amongst these secondary banks could have led to contagion and domino effect collapses. The crisis was not purely a British affair. In 1974 the German bank Herstatt Bank failed, as well as three small banking houses, and there were also problems with banks in New York City in the USA.

The crisis demonstrated the problems faced in recovering the security for non-performing loans when the market for the underlying assets ceases to exist and the collateral no longer has any liquidity. This was primarily a problem with commercial property. House prices fell substantially in real terms as house price growth was below the rate of inflation, but house prices did not fall in money terms. The implication is that those with unaffordable mortgages, for instance, because of the loss of employment, could potentially trade their way out of difficulty by selling their property for a sum that would enable their debts to be paid off. Lenders of residential mortgages were therefore not under the same pressure from non-performing loans as lenders on commercial property were. At that time, the principal lenders on residential mortgages were building societies. Being mutually owned bodies, they had limited equity with which to absorb losses.

The boom and crash of 1972–1974 were seen by some contemporary analysts in Britain as a one-off land boom, with parallels to historic ones rather than being part of a cycle (Neuburger & Nichol, 1976). Consequently the 1974 crash led to a search for policies capable of preventing repetition of similar events in the future rather than it being seen a cyclical phenomenon. To the extent to which these events were seen as cyclical, it was part of an electoral cycle with governments promoting economic growth ahead of re-election rather than an economic cycle. Keynesian style demand management was regarded as having banished the classic trade cycle. Interest in property cycles really only took off after the crash of 1998–1999. Regulatory initiatives centred on better financial regulation, improvements in property valuations and the problem of the exercise of security over numbers of property-backed loans simultaneously.

The Bank of England's response to the 1973–1974 crash was essentially an ad hoc one put together in the face of a crisis. It reflected weaknesses in the way in which secondary banks and non-bank deposit-taking institutions were regulated and the resulting limitations on the macro-prudential options available to policymakers. Unlike the clearing banks that were reliant on retail deposits, the Bank of England had been unable to restrain the growth in the lending operations of secondary banks dependent on wholesale deposits. The lifeboat operation was a damage limitation exercise to ensure that contagion did not spread to the regulated banking system on which businesses and the public depended. The response took place in an environment in which there was limited transparency and the main financial institutions could operate behind closed doors as a private gentleman's club. Such a regime could not survive in a world in which there was unrestricted competition between financial institutions and greater market transparency. A shadow banking sector had emerged that was outside the control of the regulators, and one that had the potential to bring down institutions within the regulated banking sector.

The key policy response was to bring the secondary banks within the banking regulatory framework. The Banking Act 1979 brought all deposit-taking institutions under the regulation of the Bank of England by requiring them to obtain a licence. Foreign financial institutions seeking to operate in the UK were also licensed. Banks and licensed institutions were required to contribute to a deposit protection fund. The 1979 act brought in a formal legal framework for regulating banking rather than

relying upon the Bank of England's informal role as lender of the last resort to those major banks that were part of the clearing house for bank transfers and to the market makers for government bonds. The Bank of England's powers were further enhanced by the Banking Act 1987 so that it could take over a failing bank with the intention of keeping it going rather than running it down in an orderly fashion. It also acquired the power to vet bank shareholders. The changes in banking law can be seen as legislative reactions to weaknesses in the regulatory system. It saw the beginnings of a pattern in which regulators play catch-up whilst financiers develop innovative and profitable ways around the regulations.

The UK ended its remaining exchange control regulations in 1979 making the pound sterling fully convertible internationally. Other economies also deregulated currency trading, for instance, with the EU abolishing restrictions on currency convertibility and the free movement of capital as part of its Single Internal Market policies, with the process being completed by 1992. The implication was that UK businesses faced with credit restrictions on domestic institutions could seek finance from abroad. The regulatory regime *Competition and Credit Control* that relied upon directives and ceilings coupled with reserve ratios for the clearing banks became unworkable as a means of controlling the supply of credit since it could be evaded by borrowing internationally. In any case, such a policy was seen as penalising the more efficient banks and protecting the market share of the inefficient. The main alternative policy available was to require banks to hold reserves according to the credit risks to which they were exposed, in other words to set standards for capital adequacy with each bank being required to hold reserves according to the risks associated with the way in which it raised funds and the activities it undertook.

The 1974 crash exposed weaknesses in the way in which bankruptcy and insolvency were handled in the UK. If one property company collapses, it is reasonable to suppose that its assets can be sold to defray some part of its creditors' losses. But what if multiple companies collapse simultaneously with banks taking possession over large numbers of assets, which they then try to dispose of? The implication is that the market is likely to become saturated. Market prices will fall and threaten the solvency of companies which, until that point, had looked likely to survive as their assets plunged in value. They may have borrowed with loan covenants that included maintaining a minimum equity stake in the business. Falling property prices would erode their equity, and any company that was unable to inject additional equity into the business would be liable to fall into technical default, even if continuing to make the repayments and interest payments required under the loan agreement. That the situation in which banks foreclosed simultaneously on delinquent loans and sought to sell the assets to defray their losses did not happen in response to the 1974 crash is largely credited to the leading insolvency practitioner of the day, Sir Kenneth Cork of Cork Gulley. He persuaded the creditors of the various companies he was responsible for liquidating not to sell the assets but to retain them until they could be disposed of in a more orderly market. Subsequently he chaired a review of insolvency law resulting in the Cork Report of 1982, which led to the Insolvency Act 1986. This introduced the process of administration, a form of protected bankruptcy, during which creditors cannot enforce liquidation whilst the

administrator, a licensed insolvency practitioner, seeks to implement a recovery plan. This might involve the sale or rescue of parts of a business, with other parts being liquidated. The key though is the orderly dismemberment of a failing company, with the possibility that some or all of it could be restructured and continue trading rather than a rush for the exit by creditors fearful that they might be the ones who were not paid.

It was normal practice in the British market for those borrowing secured against property to obtain a valuation from a qualified valuer. In principle, the valuation ought to provide the lender with the comfort that, in the event of default on the loan, there would be assets that could be sold to defray losses. As has been noted, this theory held good for residential mortgages after 1974 as house prices fell in real but not money terms. This was not the case with commercial property loans and raised questions about the quality of valuations. There is no system of licensing valuers in the UK. However, the major users of valuations, such as banks, have agreed only to make use of valuations from major professional bodies, principally the Royal Institution of Chartered Surveyors. Over time, as a result of mergers, this has left only the RICS and some specialist bodies, many of whose members are also members of the RICS. This means that the professional bodies in effect act as licensing institutions.

Professional negligence was determined by the courts on the basis of what would be expected of a reasonably competent professional. A valuation is undertaken at a particular day using the market information available then. If market circumstances change, a valuation that was competently undertaken on, say, 1 August 1973 might be significantly higher than a valuation of the same asset carried out on 1 August 1975. Reliance on the courts to determine what was and was not negligent practice suffers from the problem of professional competence being uncodified and potentially subject to different interpretations. The response was to develop valuation standards that are mandatory for members. The RICS produced the first edition of its *Statement of Asset Valuation Practice and Guidance Notes* in 1976, with a second edition in 1981, and the first edition of its *Manual of Valuation Guidance Notes* in 1980. What valuations standards do is to define terminology and establish the methods and processes to be followed unless there are good reasons not to. Standards are not static but evolve over time to reflect issues and concerns. One of the key problems is whether valuers in different jurisdictions follow similar standards. This has led to the development of internationally recognised valuation standards. The International Valuation Standards, which are designed to be compatible with International Financial Reporting Standards, have been produced by the International Valuation Standards Council (originally known as the International Assets Valuation Standards Committee) since 1981, and the European Valuation Standards, which are designed to be compatible with European Union law, have been produced by the European Group of Valuers' Associations since 1997. Most of the leading valuation professional bodies are members of either or both of these and have incorporated their standards into their national valuation standards. One particular issue has been the widely differing methods used for the measurement of land and buildings, which result in inconsistencies in the way in which unit values are

quoted according to which areas are actually included. This led to the formation of the International Property Measurement Standards Coalition, which since 2015 has sought to measure properties in using consistent terminology so that the measurements produced using national standards can be compared.

The 1980s Crashes and the Liberalisation of Standards

The crash of 1979–1980 was primarily a British affair, though the second OPEC oil crisis in which the cartel increased prices also played a role. The UK experienced rapid inflation in the 1970s, with a rate of 22% in May 1980. In 1979 the newly elected conservative government of Margaret Thatcher introduced deflationary policies, including increasing taxation, reducing public expenditure and increasing interest rates so that inflation fell to 4% in April 1983, though much of the fall was due to the reduction in world commodity prices. The Bank of England increased its minimum lending rate to 14% in 1979 and then to 17% and, after a reduction to 13%, had a rise back to 16% in 1981. The policies brought about a sharp fall in property prices as borrowing rates rose and the demand for property fell. The budgets of 1979 and 1980 were aimed at reducing the Public Sector Borrowing Requirement with the intention of curbing growth in the money supply by reducing the supply of short dated government debt used by banks as reserve assets (Johnson, 1991).

The crash of 1989–1990 was also primarily domestically generated. The UK had joined European Exchange Rate Mechanism, the forerunner of the euro. Under this, countries were to maintain their currency values within given limits, the alignment of currencies' values being intended to be the first step towards their replacement by a common currency. The UK had joined the system with an exchange rate for the pound sterling that was too high relative to the Deutschmark, making exports of UK goods and services uncompetitive. In the face of a mounting balance of payments' deficit and the consequential expectation of investors that the pound sterling would be devalued, the agreed exchange rate limits could only be maintained through increasing interest rates, rising to 15%, to encourage deposits in sterling by foreign investors (Smith, 1992). Rising interest rates brought about recession in the economy and a crash in the housing and property markets.

Property prices fell in real terms, as they did in 1974. A key difference from the 1974 crash though was that house prices also fell in money terms. Those who had taken out a mortgage in the immediate run up to the crash could not trade their way out of financial problems by reselling their homes for a similar money price to what they had paid. Many households with mortgages found themselves in negative equity in which the value of their property was less than the outstanding mortgage advance. Those compelled to sell because of changes in circumstances, like unemployment or wage reduction, found themselves unable to do so because the fall in house prices meant that they could not clear their mortgage debt. Consequently mortgage defaults and repossessions rose. Annual mortgage possession claims issued by the county courts in England and Wales rose from 47,769 in 1988 to

142,905 in 1991[1]. In such circumstances, lenders found it difficult to sell properties over which security had been enforced, making significant losses when they tried to do so. Major lenders sought to find alternative ways in which debt might be recovered, including moving occupiers on to rental contracts, interest-only payments, interest holidays, extending mortgage terms and permitting parents to guarantee mortgage debt against their own properties. Recovery came once the UK left the ERM in 1992 after the government recognised that maintaining the value of sterling had become impossible. This allowed interest rates to be reduced and, in due course, for the economy and property market to recover.

During the 1980s the UK in common with many other countries underwent significant liberalisation. The governments of Margaret Thatcher privatised many state-owned industries, including introducing competition into monopoly utilities, and sold council housing to the tenants at discounted prices. As previously has been noted, the monetary regulation regime, *Competition and Credit Control*, with its reliance on directives and ceilings, could not survive in a world without exchange controls, but it was also seen as impeding competition by restricting the growth of efficient banks, hence the move to a regulatory regime based on the holding of reserves based on risk assessment. The 1980s saw a policy of liberalisation throughout the financial services sector. The London Stock Exchange rulebook that restricted who could trade in and make markets in shares was deemed uncompetitive, and the Exchange opened up in a process known as the Big Bang. Many of the restrictions placed on building societies were removed by the Building Societies Act 1986 so that they could offer banking services such as current accounts, overdrafts, loans to businesses and credit cards, make greater use of wholesale funding and, ultimately, with the consent of their members, cease to be mutual bodies and become public limited companies and fully fledged banks.

The problem in a world of globalised finance is regulatory arbitrage resulting in companies being able to raise credit in economies with weak financial regulation and banking supervision whilst penalising financial institutions from countries with strong prudential regulation. In 1986 the UK and USA reached a bilateral agreement on a system for weighting assets according to credit risk and sought to extend this to other leading economies. The Basel Committee on Banking Supervision (BCBS) was established by the central banks of the G-10 countries in 1974. This led to the first international capital standard, Basel I, issued in 1988, which set capital adequacy ratios according to the risk class of the asset. The problem with Basel I was the broad categories of risk class. The breadth of the categories created the potential for mixed collectives containing assets of widely differing risks being placed in the same risk class. Regulatory arbitrage could exist if different countries adopt differing approaches to the definition of risk categories.

The crash of 1989–1990 came during the early years of this new liberalised and competitive financial regime. It was a relatively severe downturn both in depth and

[1] Office of National Statistics, Mortgage and Landlord Possession Statistics, https://www.gov.uk/government/statistics/mortgage-and-landlord-possession-statistics-earlier-editions-in-the-series

length but resulted in relatively little stress for the financial services sector. For instance, none of the building societies that had taken advantage of the opportunities for diversification in assets and liabilities failed. The survival of the liberal regime under such conditions seemed to send the signal that light touch regulation based on competition was effective. There was a weakening of enforcing the regulations and in the use of supervisory powers (Barth et al., 2001). The message that all was functioning well was misleading as the World Bank has noted:

The decade prior to the 2007–2009 global financial crisis was characterized by the deregulation of banking sectors in several countries, supervisory shortcomings, and accounting misrepresentations, especially in advanced countries. The onset of the crisis ushered in a period of intense regulation, with several initiatives put in motion to address the flaws that emerged during the crisis. (World Bank, 2019, p. 21)

The 2008 Financial Crisis and Its Aftermath

The 2008 crash was brought about by a financial crisis that started in the USA with failures in sub-prime mortgages and collateralised debt obligations. Intimation that a financial crisis was about to strike began in March 2007 when the British bank HSBC announced that it was experiencing higher than expected delinquency rates on its US sub-prime loans. It had purchased the Household Finance Corporation, a US bank specialising in the sub-prime market, in 2002. Sub-prime loans can be expected to have a higher delinquency rate than conventional loans, but this ought to be compensated by higher interest rates. At a time when yields are depressed by an excess of funds chasing investment opportunities, sub-prime loans can appear attractive. However, if the rates are mispriced by making sufficient allowance for the likely default rate, then losses will eventually arise. In a market in which yields are being forced down by competition for outlets for funds, this is likely to happen. By the summer of 2007, a number of banks stated they would be unable to support funds managed on behalf of investors that had been put into sub-prime and collateralised loans.

Globalisation means that asset-backed securities can be marketed internationally enabling financial services companies to benefit from diversification through securitisation. If risk is improperly identified, priced and allocated, then contagion can spread if there are widespread defaults amongst the borrowers whose loans have been syndicated. This happened with sub-prime loans and other collateralised debt obligations, where rating agencies, in receipt of fees from the issuers, gave credit ratings that implied lower levels of default than what turned out to be the case. The securitisation process involved a number of frictions that can contribute to mispricing and give rise to predatory borrowing and lending resulting from asymmetrical information (Ashcraft & Schuermann, 2008). Financial services companies in a globalised world have greater opportunity to function across borders and can engage in regulatory arbitrage to mitigate the impact of restrictive regulations in any one country. All banks are at risk of defaults on loans, which in turn can make them

unable to repay depositors when these fall due. This can result in a run on a bank should depositors fear liquidity problems and the loss of deposits or being gated without access to their funds. Contagion can affect banks which have not directly invested in the problematic assets if, as happened in 2008, the inter-bank lending market closes as banks lose faith in each other's ability to repay. Short-term liquidity can in these circumstances dry up, and financial services companies find themselves unable to roll over short-term finance when loans mature.

In the UK in September 2007 the government stepped in to support the Northern Rock Bank, after a run on the bank, in which depositors queued up outside branches to withdraw their savings. It was a former building society that had converted into a bank and specialised in high loan to value mortgages. It had grown rapidly by drawing much of its funds on a short-term basis from the wholesale financial market and found it difficult to refinance them. This was the first run on a bank in the UK since the collapse of the Bank of Glasgow in 1878 as a result of fraud. Northern Rock was nationalised in February 2008 when it became apparent that its business model was unsustainable at a time when investors were withdrawing from the wholesale finance market due to fears that other banks would not be in a position to repay loans. By the autumn of 2007 the British government had begun to provide liquidity support for other banks. During the course of the crisis, none of the former building societies that had demutualised under the 1986 act survived, being either forced into mergers with better capitalised banks or nationalised when they failed.

Rates in the 3-month interbank rose from approximately five basis points above policy rates at the beginning of 2007 to around 90 basis points in the early summer of 2008 and to a peak 250 above policy rates for sterling and 350 for US dollar rates (*Bank of England Financial Stability Report*, June 2009). In the USA in March 2008, Bear Stearns was rescued by being bought by JP Morgan Chase with the help of US government funds. During September and October 2008, the financial system showed signs of financial meltdown. In the USA Fannie Mae and Freddie Mac, which purchase mortgage-backed securities from banks and savings and loan associations and also underwrite ones sold to third parties, were taken into conservatorship, Lehman Brothers filed for bankruptcy, Merrill Lynch merged with Bank of America, and the US government provided loans to and took a 79.9% stake in the insurance company AIG, that specialised in mortgage protection insurance. The US Congress approved the TARP plan to acquire toxic assets, enabling troubled banks to raise liquidity by selling assets to the Federal Reserve Bank.

In the UK, the government nationalised the Bradford and Bingley Bank. It engineered the take-over of the troubled Halifax Bank of Scotland (HBOS) by Lloyds TSB. The Cheshire and Derbyshire Building Societies were taken over by Nationwide Building Society, the largest of this type. The Irish government guaranteed deposits of all its banks, not just retail deposits up to a maximum amount but also wholesale deposits. This was quickly followed by other countries as a means of trying to encourage belief in the stability of their banking systems. Such an approach risks nationalising the debts of failed banks whilst privatising the profits from taking excessive risks. Ireland was obliged in 2010 to secure a €85 billion bailout package from the European Union and International Monetary Fund as its

GDP fell by 17% in money terms from its peak, the government deficit increased to 11% of GDP and concerns developed about the solvency of the major banks. The government injected €46.3 billion (equal to 29% of GDP) into the major banks and building societies to recapitalise these. The National Asset Management Authority was established in 2009 to acquire impaired property-related assets from the banks (European Commission, 2011). "The solvency of the Irish sovereign and the banking system have become inextricably linked" (European Commission, 2011, p. 15). Banks in Belgium, Netherlands, Luxembourg and Germany received government support. The Icelandic banks collapsed, with the British government using anti-terrorism legislation to close their subsidiaries in the UK after it became apparent that the Icelandic government planned to renege on its obligations to guarantee retail deposits under European Economic Area rules. Banks found it difficult to raise finance, including rolling over short-term loans obtained through the wholesale finance markets, and interbank lending dried up as banks feared they would not be repaid. Losses on loan defaults eroded capital causing banks to further reduce lending. What started as being a liquidity crisis in the banking system had the potential to cause widespread failures in the economy as banks recalled loans, including those made to financially viable companies, because of the pressures on their own liquidity and solvency.

The response of the British government to the crisis was to adopt policies aimed at stabilising banks and restoring confidence in the banking system. It also sought to persuade other governments to adopt similar policies, notably the USA, so that the response to the crisis was an international one rather than relying on the creditworthiness of individual governments. The Bank of England lowered its interest rate to a historically unprecedented 0.5% in March 2009, the previous lowest rate in its history having been 2.5%. It guaranteed banks' debt, particularly the debts of banks to each other, and introduced asset swaps under which selected assets could be exchanged for cash. It provided insurance of bank assets for a fee to limit the level of losses the banks could experience. It required banks to recapitalise through rights issues to shareholders or the injection of new external capital, underwriting the share issues of banks to ensure that recapitalisation was successful when, as anticipated, shareholders in some banks failed to take up their pre-emption rights. As a result it became the major shareholder in the Royal Bank of Scotland and the merged Lloyds TSB and HBOS. Under the European Union's state aid regulations, both of these banks have been forced to divest themselves of assets, a process that has proved problematic. Between June 2007 and January 2009, the market value of British banks fell by approximately £350 billion, but they were able to raise £100 billion in additional capital (Bank of England *Financial Stability Report*, June 2009). It is estimated that the number of financial institutions in Europe fell as a result of the crisis by approximately 30% and in the USA by 37% with over 100 European banks requiring bailouts (World Bank, 2019).

As in 1979–1980, the fall in house prices in money terms meant many of those facing difficulty were unable to trade their way out of their financial debt because of negative equity. Mortgage possession claims in England and Wales rose from 45,356 in 2004 to 111,763 in 2008, but fell to 56,968 in 2010 as lenders

implemented strategies based on the lessons learned in 1979–1980 in recognition that enforcing possession in a falling market does not necessarily produce the optimal outcome for them.

Once the immediate financial crisis was past, governments sought to put in place policies aimed at preventing repetition. One of these has been an increase in the minimum regulatory capital banks are required to hold. Amongst high-income countries, capital holdings increased from a mean value of 12.9% of risk-weighted assets in 2008 to 18.6% in 2016 (World Bank, 2019). It should provide for greater stability in the banking sector except that the definition of capital has become less stringent in some countries by allowing for the inclusion in the calculation of tier 1 capital hybrid debt instruments, asset revaluation gains and subordinated debt (Anginer et al., 2019). Property asset revaluation gains may prove illusory during the next recession.

Associated with increasing the capitalisation of banks has been the use of stress tests to test whether banks are sufficiently capitalised to cope with extreme events. Stress testing is likely to enhance the reputation of regulators and investor confidence in banks if the scenarios are realistic, but governments and central banks may be reluctant to carry out tests that indicate that significant numbers of banks may fail them. The problem is that if banks respond to the requirement to increase their capital requirements by shedding high-risk lending, thereby increasing the capital ratio without acquiring additional capital – and there is evidence that this is what banks have been doing – then this is likely to be problematic for commercial real estate investment and residential development as these loans are likely to be amongst those dropped. In addition, borrowers of mortgages have been subject to more stringent tests as to whether they can afford repayments. The expansion of deposit insurance provided greater confidence for small depositors whilst limiting the potential liabilities for taxpayers. Most high-income countries have developed creditor bail-in procedures (World Bank, 2019) which may limit the moral hazard risks from taxpayer guarantees of deposits. There has been requirement for banks to have living wills so that there is orderly resolution in the face of financial distress or failure. Bail-in procedures and living wills are largely untried though bail-in procedures were used in the Bank of Cyprus in 2013. In the USA the Volcker Rule prevents deposit-taking banks from making risky investments, and in the UK following the Vickers report, financial institutions with deposits in excess of £25 billion are required to separate their deposit-taking activities from their investment banks and are prevented from transferring capital from their retail deposit-taking arms.

Basel I focussed on credit risk rather than liquidity and operational risk (World Bank, 2019). The regulation of banks has moved under Basel II and Basel III towards the use of risk-weighted assets as the basis for setting minimum capital bank capital requirements. This is generally welcome since it means that banks can hold different levels of reserve according to the risks of the assets and that capital adequacy can be adjusted to the type of business the bank carries out. Increasing the capital that banks are required to hold can be a partial substitute for closer regulatory supervision. It enables regulators to place restrictions on bank distributions at times

when the holding of additional capital would be desirable and to increase capital requirements at times when lending markets appear to be overheating. Banks can determine whether particular activities are worthwhile in terms of their impact on capital requirements. Attempts to overcome the mixed collective problem through Basel II (2006) "increased the complexity and opacity", raising costs for regulators and the regulated, and undermined regulations and market discipline (World Bank, 2019). Basel III has increased the equity banks are required to hold and counter-cyclical buffers, though it is mainly higher-income countries that have adopted it (World Bank, 2019). The approach does imply that banks and regulators are capable of assessing risk weightings and that banks do not seek to game the system by supplying distorted information or exploiting regulatory arbitrage through differences in how risk-weighted assets are defined by different jurisdictions. There are questions as to whether regulatory supervision capacity has expanded sufficiently to police the new systems (Anginer et al., 2019). Since 2008 large banks have become larger and more complex, with systematically important banks increasing their share of global banking assets, whilst cross-border resolution systems remain undeveloped and untested (World Bank, 2019). The World Bank (2019) has concluded that the availability and quality of information disclosure have not improved significantly since the 2008 financial crisis, which is challenging for regulators. The respondents to the World Bank survey though overwhelmingly thought (81%) that financial regulations had reduced or mitigated the transmission of international shocks.

The implication of these changes is that real estate is likely to find obtaining loans from the banking sector more difficult, which could curb the tendency for banks increasing their lending to the sector when faced with rising deposits that require an outlet. For listed property companies, raising finance through new equity or tradeable loan securities like debenture stock is feasible, but the implication is that smaller companies will find raising capital from the banking sector more difficult, especially development companies needing to raise project funds. One possibility is that capital is raised from the shadow banking sector that operates outside of the regulatory framework or from banks that are able to take advantage of regulatory arbitrage through exploiting the differences in prudential regulation between countries. In other words, enhanced regulation of the banking sector may serve to funnel finance, particularly for the real estate sector, into areas which are less well regulated, as happened ahead of the 1974 crash.

Why Improved Regulation to Curb Cyclical Activity Is So Problematic

Each of the four property crashes brought out the close relationship between the property market and the financial sector and the impact on the banking sector of collapses in property prices and defaults by borrowers. The provision of mortgage finance to both households and companies constitutes an important part of bank

lending. In addition, when businesses borrow they often provide collateral in the form of real estate assets. Banks may also increase their equity in periods of property price growth through revaluing their assets. During periods in which property prices are rising, households are able to increase their borrowing for house purchase and to withdraw equity to finance consumption as the collateral they are able to offer increases. Banks may also anticipate house prices continuing to rise and so may increase their loan to value ratios, thereby reducing the initial security taken in the belief that this will increase over time. In some cases, they may even offer loans in excess of the collateral to cover legal fees, property transfer taxes, removal costs and furnishings. Similarly, rising property prices increase the collateral that business is able to offer for loans and enables companies to increase their debt. When property prices fall in recessions, lenders may discover that, when they foreclose on delinquent borrowers, the collateral is less than the value of the loan. This has the effect of eroding banks' capital. They may be forced to call in other performing loans as a result or not to permit these to be rolled over in order to maintain capital adequacy ratios. A credit crunch may trigger the removal of deposits by investors fearful of a bank collapsing, particularly wholesale deposits which tend not to be covered by deposit protection schemes or are vulnerable to bail-in processes should a bank fail. Falls in property prices can produce a domino effect in which one bank collapses because its capital is insufficient to cushion it against defaults or it cannot refinance wholesale deposits when these become due for repayment. Its default can then produce further failures amongst the banks that have lent to it or as a result of depositors withdrawing their money from other banks due to a general loss of confidence. Failures amongst banks resulting from defaults by property borrowers when prices fall are likely because of the relationship between the property industry and the banking sector, gearing levels in the property sector being high and borrowers having an implicit put option by defaulting on loans, thereby leaving lenders as enforced buyers at whatever value they had placed on the security.

The changes in regulation that followed each property market crash have failed to eliminate cyclical activity. The changes may not have been wholly ineffective as the severity of the subsequent downturns may have been mitigated as a result. However, the financial system is constantly evolving and developments in financial markets can blunt their impact. Regulators have to deal with financial innovations, particularly those taking place outside of the regulated banking sector and the leakage of funds out of the regulated sector into it. Tightening up regulation of the banking sector, as has particularly happened since 2008, risks encouraging growth in the shadow banking or non-bank financial services sector (World Bank, 2019). Increasing the complexity of regulation can make regulation less transparent and more difficult to enforce. It increases the potential for regulatory arbitrage by multinational financial institutions, who are able to base activities in locations where regulation is less comprehensive or rigorous. Regulatory arbitrage enables the private sector to circumvent new regulations by borrowing from outside the more tightly regulated banking systems, leading to further regulations to close loopholes as regulators try to catch up (Caprio et al., 2010). It also enables banks to put limits on the powers of regulators due to their ability to decamp to more favourable jurisdictions (Lagarde,

2018). "Regulatory reform is also a slow-moving process that does not match the speed at which the private sector innovates" (World Bank, 2019, p. 8). To understand why it has proved impossible (to date) to eliminate property booms and busts through enhanced regulation, it is necessary to examine the root causes that lie behind property cycles and whether their causes are inherently capable of being regulated.

Real estate market is a relatively inelastic supply, with adjustment to changing circumstances being slow. As a result rising prices can persist for some time before new supplies come on to the market (Herring & Wachter, 1999; Adams & Füss, 2010). In periods of recession, real estate assets are likely to be mothballed and retained in the hope of being re-let when recovery occurs rather than being scrapped, unless they have become obsolete and incapable of adaptation. New features in property design tend also to cluster in time, which could produce an innovations-based cycle (Barras, 2009). New investment increases productivity but results in obsolescence shortening the economic life of the existing capital stock. Scrappage is only likely to occur when there is the prospect of more profitable reuse, something that is more likely as recovery takes place rather than during the recession phase of a cycle.

The greater the degree of inelasticity, the more likely it is that price bubbles will occur (Glaesar et al., 2008; Goodman & Thibodeau, 2008). With inelastic supply, only a modest degree of optimism is needed for a price bubble to result (Xiong, 2013). This suggests that policymakers need to address inelasticity in supply if they are to minimise the impact of cycles. This implies policy initiatives to tackle land shortages, such as easing constraints imposed by planning consents, zoning regulations and building controls, increasing labour supply to the construction industry through skills training, investment in automation and prefabrication and improving supply chains for construction, such as the availability of building materials and increasing prefabrication. These require policy approaches geared towards the supply side rather than short-term demand management policies. Many of the causes of inelasticity require long-term initiatives that are not designed to function contra-cyclically. They may also conflict with other policy objectives, such as the preservation of the countryside and farmland or achieving environmental targets.

Real estate markets lack a key means by which asset price bubbles are constrained in stock markets, namely, short selling (Herring & Wachter, 1999). There are likely to be divergent views in any market about future trends in prices. Short selling acts as a constraint on excessive optimism in security markets as pessimists are able to bet against rising prices, thereby mitigating tendencies for prices to rise. In the absence of short-selling, optimists' opinions are likely to influence the market price as the pessimists have no outlet through which to express contrary views (Grover & Grover, 2014b). There is no equivalent in real estate markets to the process of stock lending in securities' markets as sellers can only sell properties that they own. Stock lending allows market bears to borrow shares, which they can then sell in an attempt to bring down the price. If they are successful, they can buy back the shares at a lower price but, in any case, are able to buy back shares to return them to the original owners at the end of the loan period. In many countries a property can only be sold by the registered owner, with controls in place to prevent sale by those

who do not own them or sales before mortgages or loans secured against the property have been redeemed. With shares, each is identical. It is therefore possible to borrow shares, sell them and replace the borrowed shares at the end of the loan period with other shares. With real estate, the specific property must be returned as each is unique.

Real estate investment is typically financed by borrowing a significant proportion of the price. Similarly development is normally financed largely by debt. A characteristic of the property market is therefore that ownership is highly geared with loans being secured against the property. As the loans are usually for a fixed sum rather than as a proportion of the eventual resale price, the purchaser benefits from any increase in price during the period of ownership. As the benefits of any upside risk accrue to the borrower, this encourages borrowers to maximise their gearing. Lenders are exposed to downside risks as borrowers have an implicit put option by defaulting and allowing the lender to take possession of the property should its value fall below the sum borrowed. A borrower may exercise this option if its equity stake is minimal or it is unable to maintain repayments or covenant obligations. Lenders can seek to mitigate this risk by obliging commercial borrowers to maintain minimum equity ratios throughout the period of the loan. Such a strategy means that the first part of any loss in value falls on the borrower but is only effective if the borrower has the resources and desire to increase its equity stake when the market price falls. If there is no recourse against the borrower in the event of default, as in practice there may be if the borrower is a limited liability company or if there are no effective means of pursuing the borrower, then the lender bears the downside risk. In the residential market, owner occupiers may be reluctant to exercise their put option for fear of losing their homes though for borrowers in the sub-prime mortgage market, this may not be such a consideration.

When a borrower defaults, the lender can enforce the security. The value of the collateral depends on the quality of valuations. Regulators can seek to improve quality through the adoption of internationally recognised valuation standards and licensing systems for valuers, which require them to obtain minimum levels of education, experience and competence and undertake continuing professional development or periodic requalification. However, even when valuations are carried out by competent valuers, they are only valid for the date on which they are produced using the information available at that time. They are not forecasts. It is up to lenders to determine the extent to which they build risk cushioning in excess of minimum reserve ratios into the loan conditions, and that is likely to depend on the level of demand for borrowings relative to deposits.

Taking collateral may not offset losses. Banks may underestimate the default risk on property loans, perceiving their collateral to offer higher risk reductions than is actually the case (Davis & Zhu, 2005). In periods of recession, property prices fall and lenders can find themselves seeking to sell distressed properties at the same time as other lenders are doing the same, thereby depressing prices. Enforcing possession tends to erode banks' capital if distressed loans exceed the value of the collateral once it is sold. In the USA, losses on residential property can be 50–70% of the original loan (Follain & Giertz, 2013). In the UK between 2008 and 2012, discounts

on sale for repossessed property averaged 23% (Fitch Ratings, 2013), with discounts of 33% for buy-to-let properties (Scragg, 2013). Regulators can magnify the effects of cycles by imposing higher capital adequacy ratios on banks when losses start to accumulate and by requiring greater provisioning for further losses (Herring & Wachter, 1999), thus forcing banks to cut back even further on their lending than the losses of capital would require.

There is asymmetry in risk between real estate borrowers and financiers. The latter are substantially dependent on data supplied by borrowers, such as cash flow forecasts. Although banks monitor borrowers, the first indication of problems with a loan may be when repayments are missed or arrears begin to build up. Asymmetries in information make it difficult for regulators to ensure the overall stability of the financial system as the banks they are regulating are likely to have imperfect information about the risks to which they are exposed. Banking is an inherently unstable business deriving its profits from borrowing short and lending long and borrowing at what depositors perceive as low risk whilst lending to borrowers at higher rates. This liquidity and risk arbitrage takes place in a highly geared funding model with limited reserves.

Income to debt multiples in property lending are typically high as it is expected that the loan will be paid off over a number of years. Loan to value ratios also tend to be high. Regulators can influence the potential exposure of banks to falling real estate prices by reducing the maximums of each they will permit. They can also impose minimum reserve ratios banks must hold for particular classes of loan, set ceilings on the amount of loans for particular activities and give banks instructions as to the loans they can grant. However, the liberalisation of banking has resulted in a move away from ceilings and directives, which are regarded as undermining competitiveness and protecting the market share of less competitive institutions.

What policymakers find more difficult to control is the activities of shadow banks and the non-bank financial sector, such as hedge, wealth management, sovereign wealth and venture capital funds and peer-to-peer lending and third-party payment platforms, as these are largely unregulated and their funds, which include those raised from the banking sector, can find their way into the property sector. Banks can shift risks off their balance sheets by co-operating with shadow banking organisations. Regulators find themselves in a situation that is analogous to squeezing a balloon – the air can be pushed out of part of the system (the regulated banking sector) but then flows elsewhere (into the unregulated shadow banking sector). A survey undertaken by the World Bank for its 2019/2020 *Global Financial Development Report* (World Bank, 2019) reported that 68% respondents thought that regulations introduced since the financial crisis of 2008 had shifted financial intermediation to shadow banking outside of financial regulation. Commercial entities in the non-bank financial sector often function with very high gearing with covenants that offer the lenders little recourse in the event of failure so that banks may be indirectly exposed to cyclical activity in the property market through their exposure to the non-bank sector.

The risk to lenders may be amplified if bank staff are incentivised to take risks by receiving bonuses for product sales or achieving lending targets (Allen & Gale,

1999). During periods of boom, developers, agents and financiers take on additional staff to cope with the rising workload. The new entrants lack knowledge of past cycles and experience of how to cope with periods of downturn. They are likely to be less able to judge lending risks as a result of their lack of experience whilst being incentivised to put growth ahead of risk mitigation. In the next recession, many of the new entrants will lose their jobs, so that the experience gained from misplaced optimism is lost. Optimistic expectations not tempered by past experience may influence the appraisal calculations of developers and their financiers, particularly if developers know that they will earn the rewards from upside gains but can avoid downside risks through the exercise of put options.

The agency problem is further exacerbated if the loans are securitised as the risks are passed from the loans' originators to other investors unable to undertake thorough due diligence but relying instead on credit rating agencies (Caprio et al., 2010). The number of different bodies involved in securitisation adds frictions and scope for mispricing errors at each stage (Ashcraft & Schuermann, 2008). Lagarde (2018) has argued that there is a problem of culture, values and ethics in financial services which "puts profit now over long-range prudence, short-termism over sustainability". She argues that ethics is not only important for its own sake but because ethical lapses have economic consequences and that better regulation and supervision by themselves cannot resolve the issues.

During periods in which incomes are rising rapidly, bank deposits tend to increase, and banks are faced with the task of trying to expand their lending in response. The growth of savings as incomes rise puts banks under pressure to find new investment outlets (Barras, 1994). An excess supply of deposits is likely to drive down interest rates and increase the search for willing borrowers. In this context property developers and investors may come to be the borrowers of last resort – borrowers with boundless optimism and capacity for generating new projects. Depositors experiencing strong income effects from falling interest rates and banks under similar pressure from shareholders to pay dividends may be willing to accept higher risks in order to maintain incomes. During periods of rising property prices, the risks of lending appear to fall as loan-to-value ratios decline. This may fuel further lending, which in turn feeds rising prices. A financial accelerator can take place in which banks' willingness to provide loans as property prices increase results in rising consumer confidence and expenditure (Bernanke et al., 1996) and feeds through into higher expected profitability from new property developments (Panagopulus & Vlamis, 2009). However, lending to property developers exposes banks to the risk that implicit put options may be exercised during the next downturn. If inexperienced bank staff are incentivised to expand lending, then the foundations may be laid for a slump if the expectations of developers and property investors are not met once the new developments come on-stream simultaneously, resulting in excess supply and lower rentals, with borrowers being unable to fulfil their loan obligations. When the market becomes saturated, developers must sit and wait for better times, halt work in progress, suffer losses through spending on the completion of projects that remain vacant or sell them at knock-down prices at a time when interest rates are likely to be rising and rental income falling. Highly geared

developers are likely to lack the financial reserves to finance incomplete or vacant developments through a recession. Banks can find themselves foreclosing on loans in a falling market and experience reductions in their capital as a result of losses. Even if regulators have curbed the worst excesses of banks, their ability to control shadow banking is likely to be limited, and regulatory arbitrage raises the potential for restraints on domestic banks being circumvented by developers obtaining funding from other sources. In the absence of exchange controls, borrowers can source finance internationally.

Regulators have limited means of directly regulating real estate markets and property development in market economies. Direct regulation through controls through rationing the supply of building materials curbs on the granting of development consents, or directives on lending are not open to them as they would be in command economies. Rather, the tools available are indirect one through controls over funding. Regulators can influence loan to value ratios, income multiples, checks on the creditworthiness of borrowers and the quality of valuations. But these will be undermined if regulatory arbitrage occurs, implying that banking standards need to be harmonised internationally. Shadow banking outside of the jurisdiction of bank regulators also undermines the effectiveness of regulation.

Conclusions

There is a close relationship between the real estate and financial services sectors in which cyclical activity in one impacts on the other. Real estate serves as an outlet for surplus deposits in periods when incomes are growing rapidly and the growth in deposits is outstripping the availability of less risky assets. It can offer the appearance of the opportunity to maintain investment income at a time when yields are subject to downward pressure. The real estate sector is highly geared with financiers disadvantaged relative to borrowers by asymmetrical information. When property values fall, real estate borrowers can exercise implicit put options and walk away from onerous loans with limited recourse. The lumpiness of real estate assets and the time taken for development increases the likelihood that planned developments will come on stream simultaneously, just as the market is peaking, and oversupply is becoming an issue. This is likely to cause defaults by borrowers, resulting in losses for financial services companies, reductions in lending as their capital base is reduced and the potential for domino-like collapses.

The financial services sector tends to expand at times of deposit growth, which can reduce the experience base of those making lending decisions as new staff are recruited. It can be also exposed to agency problems if it incentivises staff to make loans in markets where finding credit-worthy borrowers is becoming more challenging. In the next downturn, staffing is reduced and institutional memory lost. Thus the cycle can begin again once deposits grow and financial services companies have to start chasing outlets for their funds.

Globalisation has opened up opportunities for regulatory arbitrage and created a more challenging environment for regulators. In any case, regulators must tread a tightrope between increasing the security of the financial system through risk reduction and allowing lending that stimulates economic growth and ensures healthy competition between lenders. Risk reduction can be achieved by requiring banks to hold greater reserves, be better capitalised and evaluate the creditworthiness of borrowers more carefully. These can be undermined if they result in the growth of a shadow banking system, particularly if these are located where financial supervision is limited in capacity. Each major recession has produced significant regulatory reforms, but regulators are constantly having to play catch-up with financial innovations and find ways of closing loopholes without choking off economic growth or competition. This raises the question of whether regulatory changes will ever be capable of controlling real estate cycles. The potential for regulatory arbitrage and the significance of shadow banking suggest that this is not possible though mitigating the worst impacts may be feasible.

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Chapter 12
Property Valuation in Uncertain and Cyclical Market Condition



Maurizio d'Amato and Yener Coskun

Abstract Traditional real estate valuation framework employs backward-looking historical data by assuming stable market conditions. However, this hypothetical framework results in biased outcomes in value forecasting specifically in a highly volatile and cyclical environment. This unsolved problem implies that real estate valuation metrics may be extended by reflecting the impacts of uncertainty and cyclicality. The contribution of this chapter will be focused on how property valuation methods deal with uncertain and cyclical market conditions for the valuation of income-producing properties. Utilizing theoretical/empirical literature analysis and professional documents, we conclude that cyclical valuation approaches may provide solutions for the weaknesses of traditional valuation framework.

Keywords Cyclical valuation · Cyclical capitalization · Cyclical asset · Real estate market cycle

Introduction

Property valuation presents a short message of value estimation involving various implicit/explicit assumptions and limitations. The main factor, making the information of the value as the relative one, is the uncertainty surrounding the valuation process. Considering that the economies are mostly in a volatile environment with various uncertainties, the asset valuation seems a profession of art with some mathematical basics rather than a complex science application. This may be typically

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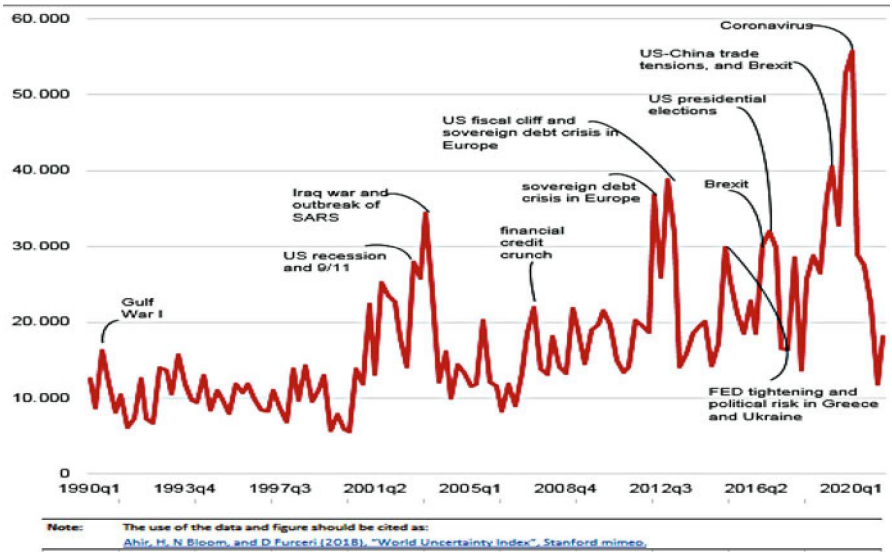


Fig. 12.1 World Uncertainty Index (1990 Q1–2020 Q1). (Source: https://worlduncertaintyindex.com/ (accessed on August 8, 2021))

observable during crisis and post-crisis periods where the prices in an economy show less information but more noise about the intrinsic value. In his seminal work, Knight (1921) discusses that fluctuations, hence uncertainty, may reduce to forecast ability, and application of the analytic method in any class of problems is always [and inevitably] very incomplete. As broadly discussed in theoretical and empirical literature of the economics and finance, uncertainties embodied in an asset value suggest a careful evaluation of the relevant factors. Therefore, it is not wrong to confirm the words of Smith (1756) also from the perspective of property market: "all the different employments of stock [or property, suggested by the Authors], the ordinary rate of profit varies more or less with the certainty or uncertainty of the returns TeGOVA (2016)."

According to World Uncertainty Index (WUI-Global), global uncertainty has increased 346% during the period of 1990 Q1 and 2020 Q1.[1] Figure 12.1 shows the events that resulted in high-level uncertainties in the last three decades. World Pandemic Uncertainty Index also jumped from 0.08 as of 2019 Q4 to 24.11 as of 2020 Q3.[2] Not surprisingly, these uncertainties ended with extreme price/return volatilities in financial and real estate markets. As observed during Covid-19 period, uncertainties may create high level of risks from the perspective of economic policy and financial markets. For example, Economic Policy Uncertainty Index for US (USEPUINDXD) increased from 22.3 as of January 27, 2020, to 363.7 as of May

[1] Available at: https://worlduncertaintyindex.com/ (accessed on 8 August 2021).

[2] Available at: https://fred.stlouisfed.org/series/WUPI (accessed on August 8, 2021).

19, 2020,[3] and VIX volatility index jumped from 13.7 as of February 14, 2021, to 66.04 as of March 20, 2021.[4] The Covid-19 period also resulted in high level of uncertainties in real estate markets. In this respect, Knight Frank reports that globally residential prices increased by 5.6% on average in 2020 due to the impact of pandemic. As the highest increases, residential prices have increased 30.3 in Turkey and 18.6 in New Zealand during 2020.[5] All these statisctical information suggest tht the markets are not stable which make questionable the role of the historical market data in a valuation process. Therefore, one may conclude that the information of the market price may not be specifically satisfactory during unstable market conditions where uncertainties become main element of pricing. Generally speaking, price discovery can be defined as "...process by which asset market prices are formed. It is a process of information aggregation through which market participant's opinions about the value of an asset are combined together into a single statistic, the market price of the asset" (Barkham & Geltner, 1995, p. 21). The valuer tries to forecast this process using market, income, and cost methodologies. The nature of the real estate valuation has several weaknesses. For example, among others, the selection of comparable may be referred to different market segment or even different market phases in the same market segment. It is possible that there are no comparables or even the comparables selected are less efficient for the valuation (Bitner, 2008). Income-producing properties may have a problem to forecasting a reliable and marketable rent for the capitalization process. In the application of cost approach, it is possible to make a mistake in the calculation of depreciation or even in the cost determination. In this activity the valuer is normally focused on transactions, data, or rents closer to the time of valuation assuming they may be representative of the future. This is particularly true in the income approach, because one of the most critical unsolved problems in the valuation of income-producing properties is the assumption of stable market condition.

Literature reveals that nothing about the future is stable but obviously uncertain; however, it is difficult to argue that existing property valuation approaches sufficiently address this complex problem. Considering that general and regional economies have cyclical natures involving high level of uncertainties, using historical prices in an estimation requires a forward-looking modelling. However, the long-standing problem in real estate appraisal is that real estate cycles are not properly integrated into valuation framework with some forward-looking models. In this chapter, we review property valuation in cyclical market conditions. We specifically analyze how property valuation methods used in income-producing properties deal with the cyclicality problems and property market cycles by analyzing theoretical/empirical literature and professional documents.

[3] Available at: https://fred.stlouisfed.org/series/USEPUINDXD (accessed on August 8, 2021).

[4] Available at:https://www.cboe.com/tradable_products/vix/ (accessed on August 8, 2021).

[5] Available at: https://content.knightfrank.com/research/84/documents/en/global-house-price-index-q4-2020-7884.pdf (accessed on August 8, 2021).

The remainder of this chapter is organized as follows. Section "Property market cycles, uncertainty, and cyclical valuation" discusses the relations among property market cycles, uncertainty, and cyclical valuation. Section "Uncertainty, cycles, and valuation problems in traditional methods" analyzes uncertainty, volatility, and cyclicality from the perspective of international valuation standards. Section "Cyclical valuation concept" concludes the chapter with our suggestions.

Property Market Cycles, Uncertainty, and Cyclical Valuation

Interconnections of building swings with overall flows of output, capital, and labor are broadly analyzed in the literature, specifically Cairncross and Thomas in England and Kuznets and Abramovitz in the United States (Gottlieb, 1976). The boom-bust periods in real estate market have severe consequences on value. Barras (1994) indicates that building cycles are inevitable being the result of the uniquely long lags between demand and supply. The author illustrates that the interactions between demand and supply in property markets eventually have feedbacks on rent, yield, and hence overall property value (see Fig. 12.2). Kaiser (1997) suggests that real estate market has historically showed certain cycle periods since the eighteenth century in the United States. Understanding real estate cycles requires consideration of the cycles that occur in the capital markets (and general economy) as suggested by Roulac (1996).

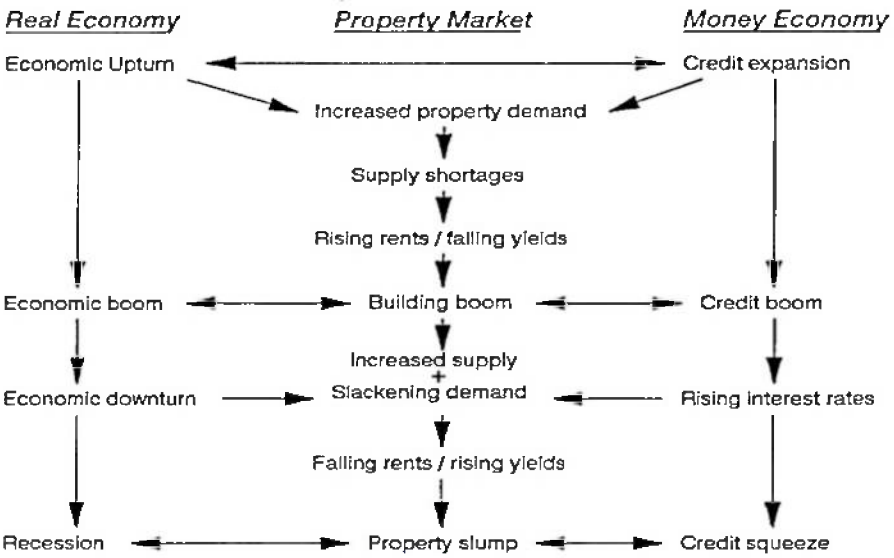


Fig. 12.2 Building cycles. (Source: Barras, 1994)

The market movements in the last couple of decades may suggest that cycles in housing and commercial real estate markets may eventually reflect the cycles of general economy and capital markets. For example, aggregate nominal value of the owner-occupied housing stock in the USA initially rose 161% during the period of 1982 and 1999 (see Case et al., 2000) and then seriously declined during subprime mortgage crisis. Zillow data suggests that the overall value of California housing market declined 22% during April 2008 and January 2010.[6] Clayton (1996) shows that the risk premium on unsecuritized commercial real estate varies over time and is strongly related to general economic conditions. By analyzing cyclical characteristics of Singapore commercial real estate and property stock prices for the period of 1975–1998, Brown and Liow (2001) find that the prices for the commercial real estate and property stock exhibit cyclical patterns. Therefore, in line with the observations of other (non-)financial markets, we may conclude that cycles have also positive/negative impacts on value in real estate markets.

Uncertainty, Cycles, and Valuation Problems in Traditional Methods

Value impact of cycles seems related to uncertainty. Uncertainty is typically defined as the conditional volatility of a disturbance that is unforecastable from the perspective of economic agents (see Jurado et al., 2015). Risk and uncertainty are poorly considered by most individuals involved in real estate analysis – in both development and investment appraisal (Byrne, 1995).

In terms of professional standards, international valuation standard committee (IVSC) defined that uncertainty in property valuation depends on three main causes: market disruption, input availability, and the choice of method of model (IVSC, Valuation Uncertainty, para 17). The three causes are obviously connected. Market disruption arises "when a market is disrupted at the valuation date by current or very recent events. . ." (see IVSC, Valuation Uncertainty, para 19). It is evident that the cause of uncertainty is observed "hic et nunc" (here and now, in Latin) without any regard for the property market cycle. Valuers consider short-term effects of a crisis without dealing in a more extensive way with property market cyclicality. The second cause is the "lack of input" which is a consequence of an unstable property market. As the third cause, the choice of the model is also a source of uncertainty because different models may lead to different results. The large body of research reveals that real estate assets have already valuation problems arising from their nature as the asset class (i.e., see Greer, 1997; Pagourtzi et al., 2003; Lin & Vandell, 2007; Mooya, 2016; Klamer et al., 2018). For example, Quigley (1999) indicates that existing real capital assets are notoriously hard to value. Markets are thin, and

[6] Available at: TotalValue2020 | Tableau Public|TotalValue2020 | Tableau Public (accessed on June 1, 2021).

the problems of appraisal and valuation are great. However, cyclical nature of the economy and property assets makes real estate appraisal much more complex task (i.e., see Kuznets, 1930; Hoyt, 1933), and traditional valuation methods do not respond to this problem effectively. Born and Pyhrr (1994) discuss that traditional valuation framework is biased toward trend analysis and often assumes constant annual changes in rents and expenses and constant terminal value capitalization rates over a 7- to 10-year projection period. In the same line of reasoning, Pyhrr et al. (1996) discuss that typical income-producing property appraisal assumes a stable market conditions, projections often differ little from current operating statements, and hence the impacts of economic/market cycle variables result in under/over-valued appraisal results. Roulac et al. (1999) discuss that traditional DCF (discounted cash flow) models that use constant rent and expense increases over the analysis period are easy to use, are inexpensive, and have become the market standard among individuals and institutions. Irrespective of the methodologies used in specific appraisals, the value of income-generating property is dependent on net operating income (NOI) growth assumptions. These growth assumptions may be implicitly imbedded in the capitalization rate or explicitly contained in price appreciation assumptions (Payne & Redman, 2003). Expected risk-return assessment has a central importance in real estate investment/appraisal applications. However, it is observable that traditional valuation methods do not effectively adopt this assessment in usual valuation applications which inevitably involve cyclical elements during estimation period. In this respect, Diaz (1991) argues that the adjustment of cash flows for inflation is well understood but discount rate inflation adjustments remain largely unexplored. Szumilo et al. (2016) considered the imperfections of real estate and capital markets (French and Gabrielli, 2004), using historical data to estimate risk-adjusted discount rates for valuation of assets can be difficult. Besides existing problems in traditional valuation methods, implying the highest level of uncertainty for cash inflows and discount rate selections, cycles or boom-bust periods in real estate markets have severe impacts on value discovery. In this respect, changing expected returns may reflect rational revisions of real estate investment risk or alternatively investor psychology or sentiment during major market movements in (commercial) property markets (Clayton, 1996). Hence, investment analysis and valuation techniques must be compatible with the dynamic market they seek to measure (Roulac, 1982: p. 573, cited in Roulac et al., 1999). The magnitude of the (apparent) divergence of property prices from fundamental values during the recent financial crisis of the late 2000s signifies that valuation procedures and analytics have moved beyond the scope of individual appraisers utilizing standard efficient market tools (Wyman et al., 2011). It seems that the increased importance of the market cycle may be one of these reasons for the growing preference for the DCF (discount cash flow) model (Roulac, 1996; Phyrr et al., 1999, cited in d'Amato & Kauko, 2012). Roulac et al. (1999) argue that real estate cycles can be ignored in the valuation models because, among others, of simplicity and lower cost of trend analysis (i.e., DCF), difficult to consider cycle model specification investment returns/risks analysis, and lack of good forecasting models. Wyman et al. (2011) also emphasize that generally accepted models (such as hedonic models, direct

capitalization, or 10-year DCF models for property held over a longer period of time) that assume rational behavior to estimate value lose validity in periods of discontinuities (Wyman et al., 2011). Overall, existing valuation approaches, largely depending on the assumptions of stable market conditions, market efficiency, and rationality, do not provide a sufficient answer to fair value estimation of real estate assets during volatile and cyclical market conditions. This problem implies the need of a new approach for the real estate valuation aiming to reflect the impacts of cyclicality and uncertainty into usual modelling.

Cyclical Valuation Concept

Cyclical capitalization models may present a useful solution for the valuation problems of income-producing properties affected by relatively frequent upturns and downturns of the market cycles as argued by d'Amato and Amoruso (2018), d'Amato, (2003), d'Amato and Kauko (2012), Costantino et al. 2009, Dokko et al. (1999) incorporate into their cyclical analysis the impacts of local supply/demand variables, macroeconomic forces, income variables, and local (MSA) level correlation effects. Szumilo et al. (2016) discuss that to reflect cash flow volatility in a real estate portfolio, the DCF model may apply discount rates based on a risk analysis and associated simulations. Consequently, for a representative period, the value can be calculated in two ways: discounting with a risk-adjusted cost of capital rate or with a risk deduction (certainty equivalent). As a conceptual approach, d'Amato (2015) argues that cyclical capitalization approach (CCA) would be useful to estimate mortgage lending value for income-producing properties in income approach. The model applied in this work reflects the impacts of real estate market cycle into modelling. The author summarizes the differences of CCA from direct capitalization model (see Table 12.1). As the most important feature, CCA employs multiple rent and capitalization rate components to reflect the impacts of cyclicality into valuation process. In this respect, author suggests to use an increasing

Table 12.1 Comparison between direct capitalization and cyclical capitalization

Formula	Cap rate	NOI
Direct capitalization		
$V = \frac{NOI}{R}$ formula 1	One only overall capitalization rate	Constant
$V = \frac{NOI}{Y-\Delta a}$ formula 2	One only overall capitalization rate	Ever growing or ever decreasing at rate g
Cyclical capitalization (premium group)		
$V = \frac{NOI(1+Y)^n}{(1+Y)^n+1}\left[\frac{1}{Y-\Delta a_{RR}} + \frac{1}{Y-\Delta a_{EC}}\frac{1}{(1+Y)^n}\right]$	More than one overall capitalization rate according to the phase of the cycle.	Increasing rent in expansion contraction phase and decreasing rent in recovery recession phase

Source: d'Amato (2015)

(decreasing) rent in expansion contraction (recovery recession) phases and more than one overall capitalization rate according to the phase of the cycle. It is also argued that CCA models may be particularly useful in the valuation process of income-producing properties. They may be also useful to determine the exit/scrap/terminal values in a DCF analysis or in the two-stage models.

Cyclical capitalization compels the valuer to a more complex task with some limitations such as providing a forecast for more than one overall capitalization rate (all risk yield). In this way, the valuer assumes a possible variability of valuation inputs along the time mainly based on a temporal window in which the valuer observes the variation of price, rent, or capitalization rates. This temporal window permits the appraiser to be aware of the variation along the time of capitalization rates. It has been defined backward holding period (d'amato, 2015) in order to distinguish to the well-known holding period that is a future temporal interval forecasted by the valuer in the traditional application of DCF analysis. In this case, this holding period may be defined as forward holding period. A further limitation of cyclical capitalization is that it compels the appraiser to a real estate market analysis of future trends that may be delivered also on subjective basis. In cyclical capitalization, valuer is required to estimate more than one capitalization rate like in the traditional direct capitalization. For example, as indicated, the valuer may assume that there are more than one capitalization rates and even different discount rates. In other words, cyclical capitalization methodology can be defined as apparently more complex but also more prudent and flexible in the opinion of value. Several applications (d'Amato, 2015, 2017a, b; d'Amato et al. 2019) of cyclical capitalization have demonstrated that the opinion of value based on cyclical capitalization is normally included in the interval between the direct capitalization based on the application of Dividend Discount Model in the expansion property market phase and the correspondent application of Dividend Discount Model in the contraction market phase. This is the reason why the model has been proposed as a possible measure of mortgage lending value.

To improve the cyclical capitalization modelling, utilizing time series analysis would be a contributive factor due to easily available data set of prices, rents, and even cap rates. Therefore, the application of more complex methodologies, involving time series analysis, would be a complementary of a robust value estimation specifically for the delicate market segment of income-producing properties. Furthermore, the application of this method provides a motivation for the cap rate selection which moves from a daily research of comparable (that may be affected by a specific property market phase) to an extensive research in terms of time and comparable. This is also true in the calculation of terminal value in the DCF analysis. Therefore, the model proposed requires a change of valuation mentality. The g-factor included in the property investment appraisal becomes not only a way to include inflation and market growth but also a way to manage the integration between property valuation and market cycle. In the same way, traditional direct capitalization may have more than one cap rate, compelling the valuer to deal with property market cycle forecast. As a consequence, above approach implies that real estate valuation process may involve a new forecasting feature with a longer and

reasonable temporal dimension. In this approach, the cyclicality of property market is not neglected but virtually included in the valuation process as a matter of fact.

Despite the facts of marketplace, the valuation process is not procyclical, dealing with different cap rates along the time. For example, the growth (g) factor is estimated for a limited time period both in Commonwealth and also in US approaches (Inwood Premise). The growth is not a forecast whose effects interest the life of a property. Growth rate becomes a measure of prices, rents, or cap rates' evolution in a single property market phase that means something closer to market reality that can be calculated without assumptions based on "Olympic Rationality" (Simon, 1969). In this way growth factors may be calculated on time series based on specific "backward holding period." The same consideration can be proposed for the valuation of the temporal length of property market phase. It may come from the observation of property market trends. There are several models of cyclical capitalization. It may include real estate market analysis, vacancy lag, and even different rents in the same model. Flexibility is a positive aspect of this methodology. According to Commonwealth approach, the g-factor is calculated considering the depreciation of the asset. In this case the depreciation is referred to as the temporal length of a specific property market phase.

As a consequence, there is a possible margin of error in the determination of the temporal length of the phase or in the estimation of overall cap rate for different property market phases, but the final result is less sensitive to the specific property market phase. The single point estimate is a prudent assessment of the value.

Uncertainty, Volatility, Cyclicality, and International Valuation Standards

The role of uncertainty in the value formation has also been recognized by the appraisal standards. The European Group of Valuer's Associations (TEGOVA) (2007) indicates that valuation uncertainty is the extent to which an assessment of the value of an asset at the valuation date might not be exact due to market circumstances, lack of evidence, deficiencies in the valuation, or differences in professional opinion. As we briefly reviewed below, IVSC, RICS, and TEGOVA set some rules and develop explanations on the role of uncertainty, volatility, and cyclicality in real estate valuation.

As discussed by IVSC (2012) and RICS Valuation (2017), a valuation is not a fact; it is an estimate of the most probable range of possible outcomes based on the assumptions made in the valuation process. IVS (2017) has some notes on the effect of uncertainty. For example, Rule 10.2 indicates that valuation report must set out significant uncertainty or limiting conditions that directly affect the valuation. Rule 20.7-b also underlines that valuers should provide sufficient information to allow users to understand the nature of each class of instrument valued and the primary factors influencing the values. In this respect, disclosure of the cause and nature of

any material uncertainty should be also made. It is discussed in Rule 40.3, besides Rule 60.10, if there is a significant uncertainty regarding the amount and timing of future income related to the subject asset, valuers should consider to apply any other approaches in addition to income approach. RICS Valuation (2017) has also several mandatory notes on uncertainty in her Global Standards. For example, it is indicated in VPS 3 that the valuer should draw attention to, and comment on, any issues affecting the degree of certainty, or uncertainty in [valuation reports]. Moreover, the guidance note named VPGA 10 provides a detailed discussion on VPS 3 Para. 2.1 (o) from the perspective of how uncertainty would be properly reflected in valuation reports. TEGOVA (2017) also provides a detailed discussion on valuation certainty and market risk in her EVIP 2 section. It is indicated in EVS 5 that valuation report should also address valuation uncertainty cases where there is a high level of uncertainty about the level of values, rents, or yields. Sub-sections 4.2.8 and 4.2.11 also involve some notes about uncertainty.

It seems that the term volatility in the valuation standards is also used to emphasize the uncertainties in the market Kuchrka-Stasak (2013). In this context, IVSC (2017) suggests to analyze the impacts of volatility of the markets for market approach in her 20.3-a and 30.7-c rules and also suggests to use volatility as the valuation input in financial instruments' valuations in IVS 500. RICS (2017) in its VPGA 2 rule for the valuation of interests for secured lending that any unusual volatility in the market at the valuation date is to be discounted. Moreover, it is also suggested that relevant valuation report may involve past, current, and future trends and any volatility in the local market. Furthermore, it seems that there are various references to volatility in European Valuation Standards (EVS). For example, in her EVS 4 standard, TEGOVA (2017) suggests as the supportive activity for the valuation that "where the valuer is aware of market uncertainty, volatility or other issues putting the value at risk, these should be considered and reported in the assessment. EVIP 2 provides support with regard to valuation certainty and market risk." Moreover, it is also emphasized in item 4.2.8 that valuation report may note marked volatility (and also valuation uncertainty) as the additional items. Interestingly, TEGOVA (2017) also indicates in several times that the valuer should be careful that speculative element be not taken into account during valuation. Therefore, we may conclude that valuation standards set some rules and guidance to explain the role of uncertainty on the valuation process. Addressing uncertainties in valuation reports seems a reliable response against the negative impacts of recent global financial crisis. Some uncertainties in valuation reports may represent merely as a disclaimer for the estimated value that may provide a professional caution to customers whose decision-making is mostly defined by the valuation reports (Rigotti & Shannon 2004). The next question regarding cyclical valuation is whether valuation standards address directly to cyclicality concepts or how they methodologically deal with the cyclical nature of the asset values and their impacts on the valuation process. The rule of 50.9-c of IVS (2017) suggests that the explicit forecast period should generally include an entire cycle when possible in the valuation of cyclical assets. It is indicated in Rule 19 that valuers must ensure that seasonality and cyclicality in the subject have been appropriately considered in the cash flow

forecasts. Addressed to cyclical assets, Rule 50.21-e indicates that the terminal value should consider the cyclical nature of the asset and should not be performed in a way that assumes "peak" or "trough" levels of cash flows in perpetuity. On the other hand, RICS (2017) advises in her VPGA 3 and VPGA 6 that one of the typical information requirements to assist the valuer in understanding the subject company and/or asset(s) could also include seasonal or cyclical trends. TEGOVA (2017) indicates the linkages between cyclical pattern and cost approach and time delay and also makes distinction between general market conditions and cyclical patterns in leasehold interests. We can conclude that globally accepted valuation standards have some notes on uncertainty and volatility; however less emphases are available for the cyclicality. In this respect, there are some notes for valuing cyclical assets but no detailed discussion on how cyclical nature of the property markets and general economy may affect the value of a property and how property value may reflect the impacts of cyclicality. Lack of sound methodological approach for cyclical assets/valuation is also striking. Although it may be difficult to quantify the cyclicality, we may argue that existing international valuation standards do not sufficiently address this problem.

Conclusion

Despite its well-documented impacts on portfolio risk and return, literature reveals that the traditional valuation approaches do not provide sufficient metrics to address cyclical assets/valuation. In both theory and practice, traditional DCF valuations in income approach have various problems when applied to real estate. This is mainly due to the fact that such techniques use backward-looking historical (capital) market data and generally assume steady state for the estimations of rent, expenses, yield, capitalization rates, and property value. Specifically observable during cyclical movements of the market, the role of uncertainty on the value estimation is generally ignored in this traditional view. However, as revealed by Global Financial Crisis, to ignore the market realities in valuation modellings may result in heavy costs. Moreover, in line with this "problematic" framework, anecdotal evidence also suggests that cyclical nature of the value is not well reflected in the value estimation of income-producing assets. From industry perspective, international real estate valuation standards such as IVS, RICS, and TEGOVA standards have also lack of sufficient discussion and methodological approach to address the role of cyclicality in valuation process. This "rule-making gap" implies that existing international real estate valuation frameworks do not reflect whole potential swings in the value defined by volatile market conditions TeGOVA (2016).

Considering possible cyclical divergences between intrinsic and fundamental values, these methodological, rule-making, and practical gaps may translate as a serious valuation risk in real estate appraisal process. We may speculate that a new value shock would be highly possible in primary/secondary real estate markets, thanks to unsolved conceptual and methodological problems of cyclical valuations.

During the next crisis period, this may probably result in an increasing credit risk in banking and securitization risk in securities market. To address this gap, we first suggest that the dynamics of cyclical valuation should better analyze in theory/practice by also considering irrationalities and imperfections in (real estate and financial) markets (i.e., see Dokko et al., 1999; d'Amato, 2015; d'Amato & Amoruso, 2018). Second, the risks of unrealistic assumptions in traditional valuation framework (i.e., see, Born & Pyhrr, 1994; Pyhrr et al., 1996; Roulac et al., 1999; Costantino et al., 2009) and hence the need of cyclical valuation should broadly be recognized by standard-setters, and related valuation metrics should be adopted by practitioners. Obviously, international real estate valuation rule-makers have a special role to address the gap. Third, as discussed in the emerging literature, researchers and practitioners may utilize cyclical capitalization approach to develop a reliable solution for the value asymmetries during cyclical periods. For example, using multiple rent and capitalization rate derived from forecasting models (see Roulac et al., 1999; d'Amato, 2015) and employing risk-adjusted cost of capital rate with a risk deduction (see Szumilo et al., 2016) may reflect the impacts of cyclicality into valuation process.

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Chapter 13
Property Market Cycle and Valuation: A Geometrical Approach



Maurizio d'Amato

Abstract It is difficult to deal with new problem using old solution. The global financial crisis allowed us to understand that real estate and financial market are more and more integrated and globalization creates a strong connection between the property markets all over the world. This chapter offers a set of methodologies to include property market cycle in the valuation activity providing a geometrical approach to the traditional valuation activity. As the traditional methodologies have been defined procyclical (DeLisle and Grissom, J Prop Invest Finan 29, 384–427, 2011), the attempt is to define a different methodological set of methods to deal with an international cyclical property market.

Keyword Property valuation · Geometrical approach · Property market cycle

Introduction

In this chapter, it is explored the relationship between property value and rent from an alternative point of view in order to take into account different methodological perspectives to include the role of the property market cycle in the valuation process (d'Amato, 2015, 2017a; b; d'Amato et al., 2019a, b). Traditional valuation models are normally not considered procyclical even if in literature the linkage between method and property market cycle was highlighted (DeLisle & Grissom, 2011). The arising natural question is why there is a perception such as " steadily rising real estate prices and return" in among even highly trained individuals working for prestigious financial institutions. Major part of the answer lies in the hypotheses under the most popular property valuation methods that assume unrealistically stable or perpetually growing income (or expected rent inflows). It seems that modelling approaches used by valuers/advisors do not help much to develop proper answers to cyclical nature of the essential valuation variables.

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In this chapter, two different approaches to income-producing properties have been proposed. In the domain of direct capitalization, an integration between real estate valuation and trigonometric function may lead to models able to provide more flexible forecast. In the following paragraph, it is proposed an integration between direct capitalization and trigonometric function to determine cap rates and the d-segment. In the following paragraph, the sine function is proposed as a way to define valuation more integrated with market cycle. Final remarks and future directions of research will be offered at the end.

Geometrical Approach: Direct Capitalization and d-Segment

Income-producing property is appraised referring to a proportional relationship between property value and market rent. The proportional relationship is based on the estimation of an income that is generally assuming as stable or normally growing. As suggested by the well-known formulas, the cyclical nature of the real estate market is omitted in the traditional valuation modelling. Market or current rent (net operating income according to US definitions) is supposed to be constant or ever growing (Gordon, 1962; Gordon & Shapiro, 1956). In this approach, the value is estimated based on the following ratio:

$$V = \frac{R}{y} = \frac{\text{NOI}}{R_0} \tag{13.1}$$

In formula 13.1, R is the market or current rent (according to Commonwealth terminology), whilst NOI is the net operating income. In the same formula, V means value, whilst y is the all-risk yield (according to Commonwealth methodology), and R_0 is the overall capitalization rate (according to US methodologies). International Valuation Standard (IVS) recalls the capitalization factor as the inverse ratio of all-risk yield or overall capitalization rate (IVS, 2020, IVS 105 Valuation Approaches and Method, para 50.25). This term is also known as Gross Rent Multiplier (GRM). Consequently, the value will be calculated as follows:

$$V = R\frac{1}{y} = \text{NOI}\frac{1}{R_0} = R \cdot \text{GRM} \tag{13.2}$$

Therefore, the relationship can be rewritten as the function of a straight line passing to the origin of a Cartesian system; therefore, it is possible to write formula 13.3:

$$y = mx \Leftrightarrow V = mR \tag{13.3}$$

where m is the capitalization factor (GRM). In graphical term, this relationship can be represented as in Fig. 13.1.

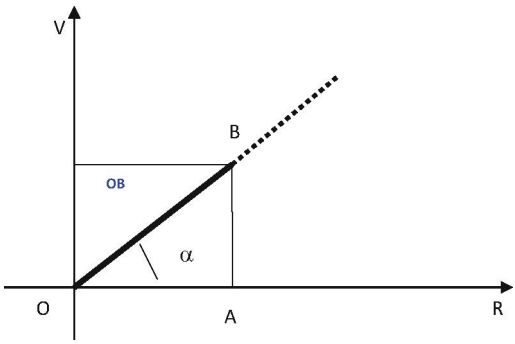


Fig. 13.1 Graphic relationship between rent and price in the direct capitalization

The capitalization rate can be seen from geometrical point of view as cot and can be rewritten as follows:

$$\cot ga = \frac{\mathrm{OA}}{\mathrm{BA}} \tag{13.4}$$

Assume we know both net rent and price of a property. It means that in Fig. 13.1 it is known both the segment OA and the segment AB. Then, it is possible to write:

$$\mathrm{OB} = \mathrm{dsegm} = \sqrt{\mathrm{AB}^2 + \mathrm{OA}^2} \tag{13.5}$$

This segment, as the proposal of the paper, will be defined as the "d-segment" having several different features that will be examined below. Valuation and counselling are normally focused on the relationship between price and rent, but forgetting the geometric meaning of the relationship between these variables. Assuming a specific cap rate or yield rate, it is possible to transform rent to value and the value in rent. In this paper, we propose to use the geometrical relationship between price and rent in a different way. Assume we know both net rent and price of a comparable property. It means that in Fig. 13.1 it is known both the segment OA and the segment AB. Therefore, it is possible to determine the *d-segment* (OB) as in formula 13.5. This may be useful also to calculate the overall capitalization rate. In fact recalling the formula 13.4, it is possible to write:

$$\cos \ ga = \frac{\mathrm{OA}}{\mathrm{BA}} \Rightarrow \cos \ ga^2 + 1 = \cos \ ec^2 a \tag{13.6}$$

Therefore

$$\cos ec^2 a = \left(\frac{1}{\sin ea}\right)^2 \tag{13.7}$$

And

$$\cot g^2 a + 1 = \left(\frac{1}{\sin ea}\right)^2 \tag{13.8}$$

As a consequence

$$R_0 = y = \cot ga = \sqrt[2]{\left(\frac{1}{\sin ea}\right)^2 - 1} = \sqrt[2]{\left(\frac{\mathrm{OB}}{\mathrm{BA}}\right)^2 - 1}$$
$$= \sqrt[2]{\left(\frac{\mathrm{dsegm}}{\mathrm{BA}}\right)^2 - 1} \tag{13.9}$$

Formula 13.9 represents a first use of *d-segment* for the determination of the all-risk yield rate according to Commonwealth terminology and overall capitalization rate according to US terminology. In other words, it is possible to determine a cap rate knowing the *d-segment* of a comparable and the value of the property. A practical demonstration of the equivalence between formula 13.9 and the traditional computation of overall cap rate – all-risk yield – is indicated below. Recalling formula 13.5 and replacing the term in formula 13.8, it will be possible to write:

$$\cot ga = \sqrt[2]{\left(\frac{1}{\sin ea}\right)^2 - 1} = \sqrt[2]{\left(\frac{\mathrm{OB}}{\mathrm{BA}}\right)^2 - 1}$$
$$= \sqrt[2]{\left(\frac{\sqrt[2]{\mathrm{AB}^2 + \mathrm{OA}^2}}{\mathrm{BA}}\right)^2 - 1} = \sqrt[2]{\frac{\mathrm{AB}^2 + \mathrm{OA}^2}{\mathrm{BA}^2} - 1} \tag{13.10}$$

As a consequence:

$$\cot \ ga = \sqrt[2]{\frac{\mathrm{AB}^2 + \mathrm{OA}^2}{\mathrm{BA}^2} - 1} = \sqrt[2]{\frac{\mathrm{AB}^2 + \mathrm{OA}^2 - \mathrm{BA}^2}{\mathrm{BA}^2}} = \frac{\mathrm{OA}}{\mathrm{BA}} \tag{13.11}$$

The ratio between OA and BA is an overall cap rate or yield rate. A further application of the d-segment is in the following equivalence:

$$\cos \ ga = Y - g \tag{13.12}$$

Therefore,

$$\cot ga = \frac{\mathrm{OA}}{\mathrm{BA}} = Y - g$$
$$\cot ga = \frac{\mathrm{OA}}{\mathrm{BA}} = y - g - d \tag{13.13}$$

It is possible to write also:

$$\begin{aligned} \cot ga &= \frac{\mathrm{OA}}{\mathrm{BA}} - g = Y \\ \cot ga &= \frac{\mathrm{OA}}{\mathrm{BA}} - g - d = y \end{aligned} \tag{13.14}$$

The d-Segment

The length of the d-segment is proportionally inverse to the cap rate. It means that the greater is the cap rate, the shorter will be the dimension of the d-segment. The longer is the d-segment, the riskier is the real estate asset. It is possible to deliver a graphical analysis to compare the riskiness of a portfolio based on the length of the d-segment. Standard deviation of this segment can be considered as a further measure of the portfolio risk dealing both with rent and value variations at the same time. Both value and rent may vary along the time. Hence, there may be a different d-segment for the same portfolio along the time. A portfolio may have longer d-segment in a specific period and a shorter d-segment in other period. d-segment may be defined as an empirical measure of risk all over the time. In fact, it is possible to compare the graphical distribution of a group of d-segment. d-segment may be also a way to compare different portfolios whose d-segment lengths may be different. d-segment is verified in all the Cartesian quadrant. In the graphic, there is an explanation of the nature of the d-segment in the four quadrants (Fig. 13.2).

Using geometrical approach of the d-segment, it is possible to appraise a property or estimate a cap rate. In an estimation, it is possible to observe that the value is a leg of a triangle with an angle of 90°. Using the *d*-segment it is possible to determine the value using second Pythagoras theorem as in the following formula 13.15:

$$V = \sqrt{(\mathrm{dsegm})^2 - R^2} = \sqrt{(\mathrm{dsegm})^2 - \mathrm{NOI}^2} \tag{13.15}$$

In general terms d-segment is a consequence of a linear relationship between property value and property rent supposed to be invariant along time. As one can see, this is a geometrical approach (trigonometric to be more specific) to the property valuation.

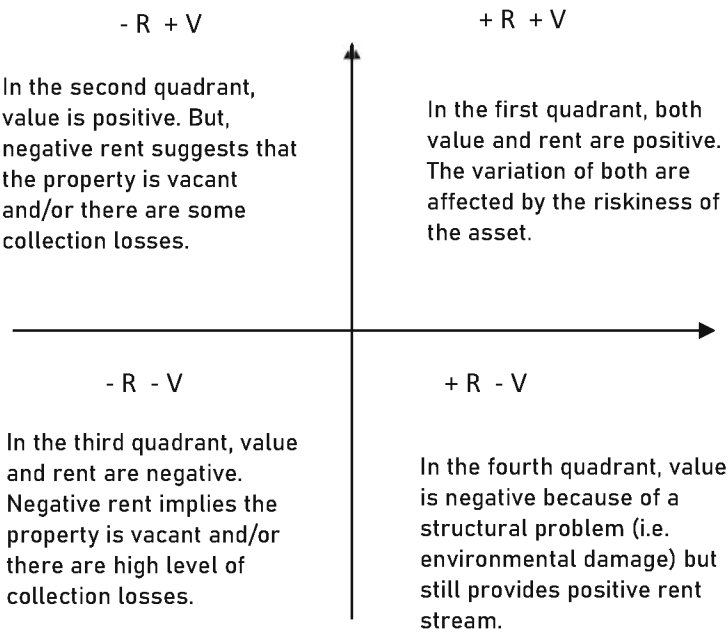


Fig. 13.2 Rent and value relations in d-segment

Geometrical Approach: Valuation and Market Cycle[1]

In similar way, it is possible to look for an integration between property valuation and property market cycle using the following formula below:

$$V_i = (R_{\max} - R_{\min}) \sin e(ct_i + n) \tag{13.16}$$

In formula 13.16, the harmonic motion is applied to the trend of property market rents. In this simplified model, R is the range of the variation of the rental value along the time with a cyclical behaviour, c is the constant of the period, whilst n is the initial phase at the moment of the valuation where:

$$R = R_{\max} - R_{\min} \tag{13.17}$$

It is possible to assume that the following model of harmonic motion (but there are several alternatives that can be used) may be adapt to represent the value along the time. In this way, we may use a physics tool to interpret the property market cycle in the context of real estate valuation.

[1] I'm in debt with Stefano Alicino, a graduate student that actively cooperates to develop this model in his graduate thesis, and my colleague prof. De Ruvo who assisted us in the mathematical part.

$$V_i = (R_{\max} - R_{\min}) \sin e(ct_i + n) \tag{13.18}$$

Starting from an available time series, it is possible to determine all the parameters of a simple function as follows in formula 13.19:

$$\begin{cases} R_0 = (R_{\max} - R_{\min}) \sin e(n) \\ R_1 = (R_{\max} - R_{\min}) \sin e(ct_1 + n) \\ R_2 = (R_{\max} - R_{\min}) \sin e(ct_2 + n) \end{cases} \tag{13.19}$$

As one can see, it is a system with three equations and three unknown terms. Clearly Rmax-Rmin represents the amplitude of a harmonic motion. In physics, it represents the maximum distance that the pendulum assumes starting from the centre. In a real estate, rent time series is the maximum difference that a rent assumes between the maximum and minimum values. The following system can be helpful to define the unknown terms starting from the real values observed in a time series R_0 and R_1:

$$\begin{cases} R_0 = (R_{\max} - R_{\min}) \sin e(n) \\ R_1 = (R_{\max} - R_{\min}) \sin e(ct_1 + n) \end{cases} \tag{13.20}$$

It is easy to determine c and n as follows:

$$\begin{cases} \sin e(n) = \dfrac{R_0}{R_{\max} - R_{\min}} \\ R_1 = (R_{\max} - R_{\min}) \sin e(ct_1 + n) \end{cases} \tag{13.21}$$

Therefore:

$$\begin{cases} R_1 = (R_{\max} - R_{\min}) \sin e\left[ct_1 + \arcsin e\left(\dfrac{R_0}{R_{\max} - R_{\min}}\right)\right] \\ n = \arcsin e\left(\dfrac{R_0}{R_{\max} - R_{\min}}\right) \end{cases} \tag{13.22}$$

Then

$$\begin{cases} ct_1 + \arcsin e\left(\dfrac{R_0}{R_{\max} - R_{\min}}\right) = \arcsin e \dfrac{R_1}{R_{\max} - R\min} \\ n = \arcsin e\left(\dfrac{R_0}{R_{\max} - R_{\min}}\right) \end{cases} \tag{13.23}$$

Therefore:

$$\begin{cases} ct_1 = \arcsin e \dfrac{R_1}{R_{\max} - R_{\min}} - \arcsin e \left(\dfrac{R_0}{R_{\max} - R_{\min}} \right) \\ n = \arcsin e \left(\dfrac{R_0}{R_{\max} - R_{\min}} \right) \end{cases} \tag{13.24}$$

As a consequence

$$\begin{cases} c = \dfrac{\arcsin e \dfrac{R_1}{R_{\max} - RR_{\min}} - \arcsin e \left(\dfrac{R_0}{R_{\max} - R_{\min}} \right)}{t_1} \\ n = \arcsin e \left(\dfrac{R_0}{R_{\max} - R_{\min}} \right) \end{cases} \tag{13.25}$$

By recalling formula 13.17, we also know the term R. Therefore, we have calculated three parameters R, c and n starting from real value observed in a time series. They come from the direct observation of a time series of property market rent. It is possible to include the terms in the original formula 13.17 and therefore:

$$V_i = (R_{\max} - R_{\min}) \sin e \left(\frac{\arcsin e \left(\frac{R_1}{R_{\max} - R_{\min}} \right) - \arcsin e \left(\frac{R_0}{R_{\max} - R_{\min}} \right)}{t_1} t + \arcsin e \left(\frac{R_0}{R_{\max} - R_{\min}} \right) \right) \tag{13.26}$$

From this generic formula, it is possible to move towards a more realistic model moving around the medium value of the rent as in Fig. 13.3, following the harmonic motion.

It is known that sine function is one of the three primary functions in trigonometry. This kind of geometric representation of the cycle may be approximated through Maclaurin series:

$$\sin ex = \sum_{n=0}^{8} \frac{(-1)^n}{(2n+1)!} x^{2n+1} \tag{13.27}$$

Or in other terms

$$\sin ex = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \ldots \tag{13.28}$$

It is possible to use this formula to transform a trigonometric function in analytic discounting each variable rent at the yield rate or discount rate y. Therefore, it is possible to write:

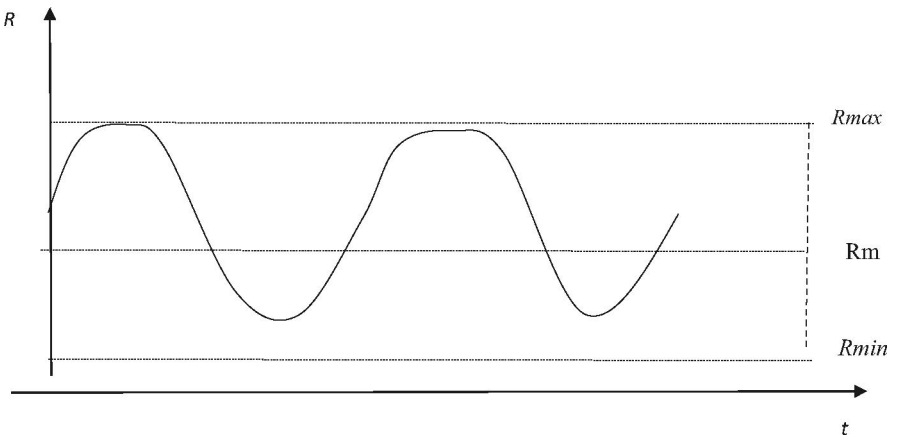


Fig. 13.3 Harmonic motion applied to rent for property valuation

$$V_1 = \left(\frac{R_{\max} + R_{\min}}{2}\right)(ct'_1 + n)\frac{1}{(1+y)^{t'_1}} - \left(\frac{R_{\max} + R_{\min}}{2}\right)\frac{(ct'_2 + n)^3}{3!}\frac{1}{(1+y)^{t'_2}} + \left(\frac{R_{\max} + R_{\min}}{2}\right)\frac{(ct'_3 + n)^5}{5!}\frac{1}{(1+y)^{t'_3}} \tag{13.29}$$

The same function can be repeated for each component of the cycle; therefore, for the second part, only t will change, and it will be possible to write:

$$V_2 = \left(\frac{R_{\max} + R_{\min}}{2}\right)(ct''_1 + n)\frac{1}{(1+y)^{t''_1}} - \left(\frac{R_{\max} + R_{\min}}{2}\right)\frac{(ct''_2 + n)^3}{3!}\frac{1}{(1+y)^{t''_2}} + \left(\frac{R_{\max} + R_{\min}}{2}\right)\frac{(ct''_3 + n)^5}{5!}\frac{1}{(1+y)^{t''_3}} \tag{13.30}$$

And finally the third part of the cycle will be the following sum:

$$V_3 = \left(\frac{R_{\max} + R_{\min}}{2}\right)\left(ct_1''' + n\right)\frac{1}{(1+y)^{t_1'''}} - \left(\frac{R_{\max} + R_{\min}}{2}\right)\frac{\left(ct_2''' + n\right)^3}{3!}\frac{1}{(1+y)^{t_2'''}} + \left(\frac{R_{\max} + R_{\min}}{2}\right)\frac{\left(ct_3''' + n\right)^5}{5!}\frac{1}{(1+y)^{t_3'''}} \tag{13.31}$$

Now it is possible to bring out the mathematical terms per part of the cycle as follows:

$$V = \left(\frac{R_{\max} + R_{\min}}{2}\right)\left(ct_1' + n\right)\left[\frac{1}{(1+y)^{t'}} + \frac{1}{(1+y)^{t''}} + \frac{1}{(1+y)^{t'''}} + \ldots\right] \tag{13.32}$$

Therefore

$$V = \left(\frac{R_{\max} + R_{\min}}{2}\right)\left(ct_1' + n\right) \times \left[\frac{1}{(1+y)^{t'}} + \frac{1}{(1+y)^{t'+T}} + \frac{1}{(1+y)^{t'+2T}} + \ldots\right] \tag{13.33}$$

And

$$V = \left(\frac{R_{\max} + R_{\min}}{2}\right)\left(ct_1' + n\right)\frac{1}{(1+y)^{t'}}\left[1 + \frac{1}{(1+y)^{T}} + \frac{1}{(1+y)^{2T}} + \ldots\right] \tag{13.34}$$

As one can see, there is a geometric progression whose ratio is included in the interval between -1 and 1 and is indicated in formula 13.35:

$$r = \frac{1}{(1+y)^{T}} \tag{13.35}$$

Summing up the three different geometric progressions using the Taylor polynomium, it is possible to write that:

$$V_0 = \left(\frac{R_{\max} + R_{\min}}{2}\right)(ct' + n)\frac{1}{(1+y)^{t'}}\left(\frac{1}{1-\frac{1}{(1+y)^T}}\right) - \left(\frac{R_{\max} + R_{\min}}{2}\right)(ct'' + n)\frac{1}{(1+y)^{t''}}\frac{\left(\frac{1}{1-\frac{1}{(1+y)^T}}\right)^3}{3!} + \left(\frac{R_{\max} + R_{\min}}{2}\right)(ct''' + n)\frac{1}{(1+y)^{t'''}}\frac{\left(\frac{1}{1-\frac{1}{(1+y)^T}}\right)^5}{5!} \tag{13.36}$$

Finally

$$V_0 = \left(\frac{R_{\max} + R_{\min}}{2}\right)\left(\frac{(1+y)^T}{(1+y)^T - 1}\right) \times \left[(ct' + n)\frac{1}{(1+y)^{t'}} - \frac{(ct_2 + n)^3}{3!}\frac{1}{(1+y)^{t''}} + \frac{(ct_3 + n)^5}{5!}\frac{1}{(1+y)^{t'''}}\right] \tag{13.37}$$

Starting from a harmonic motion, we may argue that it has been possible to define a formula describing through sine function approximation for a regular cycle. It is possible to improve the model introducing a drift or modifying the mathematical function to meet a time series or a forecast modelling based on ARIMA approach to provide a reliable forecast of the valuation based on property market cycle (McCough & Tsolacos, 1995). Furthermore, it is worth to notice that there are several other trigonometric functions and different possible motions in physics that may be helpful to analyse property values during different phases of property cycle. No need to say that this is a simple example of interpolation of a mathematical function. In reality these concepts may be employed in time series analyses in econometric modelling settings.

Conclusions and Future Directions of Research

In this paper, it has been proposed a simplified alternative geometrical approach to real estate valuation. It has been shown how Pythagoras theorem and trigonometric function may help us to understand and to interpret property market cycle in the valuation of income-producing properties and how to deal with different methods in the determination of overall capitalization rate and real estate valuation. The methods proposed demonstrated how it is possible to extend the valuation process

dealing with different methodologies. Probably, the challenges represented by the bubbles in a globalized market require these different approaches (Neuhauser, 2015; Constantino et al., 2009). In the Age of Information, time series on rent property and even cap rate (all-risk yield) are more and more available. It means that the traditional concept of comparable may be extended using different sources of information directly related to the valuation process. We can see an evolution from the strict concept of comparable to a wider concept of real estate information that may allow the appraiser to deal with more complex tools. Geometrical methods may help us to improve new valuation metrics that may be less sensitive to property market cycle (DeLisle & Grissom, 2011). This paper shows that it is possible to deal in a different way the same problems. Further research may be useful to apply proposed model and to observe the dimension of the integration between property valuation process and trigonometric functions. Other researches may be required to compare the traditional valuation techniques with this emerging approach.

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Chapter 14
The Transactional Asset Pricing Approach: Property Valuation Implications and a Potential for Fundamental Value Research



V. B. Michaletz and Andrey Artemenkov

Abstract The chapter reviews the Transactional Asset Pricing Approach (TAPA) developed through the contributions of Michaletz (2005), Michaletz et al. (Income approach and discount rates for valuing income-producing illiquid assets – Outlines of new framework: Revisiting the concepts in income approach and developing the model of illiquid assets transactional pricing. ICFAI Journal of Applied Finance; Proceedings of the ICFAI University and the University of Philadelphia V International Conference on Business and Finance, Hyderabad (India), 2006. Available at SSRN: https://ssrn.com/abstract=996016, 2007), Galasyuk (2018), Michaletz and Artemenkov (Real Estate Manag Valuat 26(1): 89–107. https://doi.org/10.2478/remav-2018-0008; https://www.degruyter.com/downloadpdf/j/remav.2018.26.issue-1/remav-2018-0008/remav-2018-0008.pdf, 2018; J Prop Invest Financ 37(3): 255–288. https://doi.org/10.1108/JPIF-10-2018-0078, 2019) for the field of professional valuation and specifically addresses its property valuation context providing an example of its application to valuing a particular property and then revaluing a property portfolio to reveal TAPA fundamental value aspects. In section "The TAPA principle of transactional equity-in-exchange and the notion of investment benchmark" we outline a mathematical formulation for the "transaction equilibrium"/"fair exchange" principle (as applied to values-in-exchange situations), which is now essentially covered by the equitable value basis of valuation under the International Valuation Standards (IVS) 2020 edition (IVSC 2020). This principle is more than two millennia old and originates in the works of Aristotle (Book V of his "Ethics"). The social and economic import of such transactional equilibrium principles is more extensively described elsewhere (see Galasyuk 2018; Artemenkov, Professional valuation as a field within economic measurements: Its bases of valuation and other international standardization challenges. Available at SSRN: https://ssrn.

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com/abstract=3040955, 2017; Artemenkov et al., Int J Critic Account 10(6): 427–446, 2018). In section "TAPA discount rate theory with single- and multi-period formulations" we describe the logic and mechanism of the multi-period discount rate analysis under the TAPA framework and provide rate of return/discount rate forecasting models for the multi-period analysis context. Section "TAPA DCF: Derivation of TAPA's Basic Pricing Equation (BPE) and its reductions to some conventional income capitalization formats" presents the derivation of the TAPA Basic Pricing Equation along with its original reductions to a number of well-known income capitalization models, such as the direct income capitalization (DIC), Gordon, Inwood, and Hoskold, used in the actual property valuation practice. Section "An example of property valuation under TAPA's basic pricing equation" contains an example of applying the TAPA Basic Pricing Equation (BPE) to value a notional property against a valuation benchmark, and section "Fundamental value properties of TAPA's BPE as suggested by a portfolio-level analysis" contains an example applying TAPA's BPE to a portfolio context, thereby highlighting some fundamental value aspects of the TAPA approach.

Keywords Transactional Assets Pricing Approach (TAPA) · DCF analysis · Multi-period discount rates · Gordon growth model · Asset fundamental values

The TAPA Principle of Transactional Equity-in-Exchange and the Notion of Investment Benchmark

The novelty of the Transactional Assets Pricing Approach (V. Michaletz & Artemenkov (2019)) is in that it recasts the basic derivations of valuation theory models proceeding from an explicit transaction-based perspective (i.e., the interests of both transacting parties – buyer and seller – explicitly feature in the modelling formulations, as opposed to the conventional *specific investor*-based standpoint/orientation found in such classical works as Fisher (1930), or reference sources such as Friedman and Ordway (1989)), or a *competitive-market orientation* found in Miller and Modigliani (1961). In lieu of implications from a *singular* specific-investor basis, a holistic transactional view (involving *both transacting agents*) is substituted. One important recent work on the transactional asset pricing approach is a comprehensive book (Galasyuk 2018); however, our formulations are a bit different and more dynamic than those pursued by V.V. Galasyuk in his research[1].

The point of departure for TAPA's transactional view is the following model situation. Assume that an agent owns an asset, which annually yields the *net operating income* NOI_i (i = 1. . .n years). Should the agent be inclined to dispose of the asset, the agent's natural wish is not to be the losing party in the transaction. This means that they will sell their asset on condition that the consideration they receive in the transaction is capable of generating the same amount of capital in the

[1] For example, Galasyuk (2018) offers no theory of discount rate derivations for TAPA.

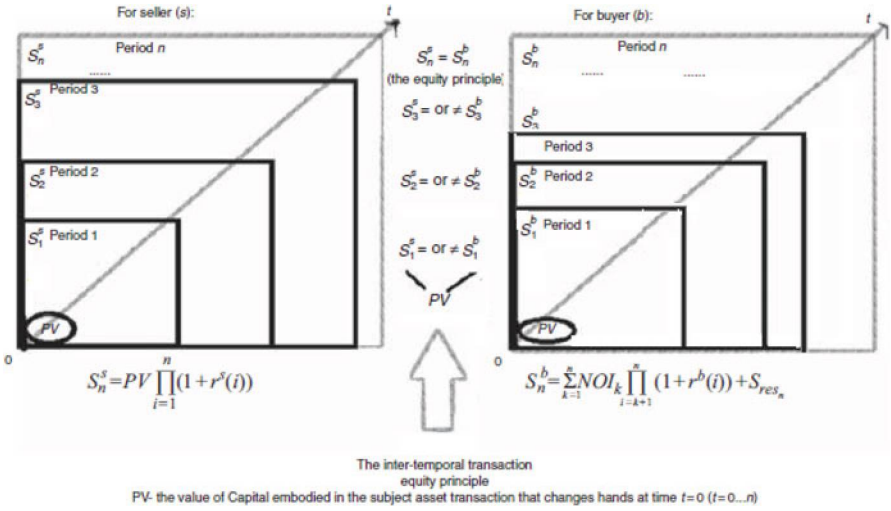


Fig. 14.1 Multi-period illustration for the intertemporal principle of transactional equity. (Source: own study)

Comments on Fig. 14.1: This is a graphic illustration of the TAPA's dynamic principle of transactional equity-in-exchange. The area of each rectangle represents the accumulation/growth, in value terms and over time, of capital embodied in the asset transaction. The initial transactional capital is represented in the subject asset value, *PV,* sought at time 0. Then it cumulates *to* $S^s{}_t$ and $S^b{}_t$ (with t for time subscripts) in the respective investment opportunities ("benchmarks") of the transacting parties: the buyer, *b*; the seller, *s*. There may be initial disparities in the rate of projected capital accumulation as between the transacting agents (i.e., as a general case and as is depicted in Fig. 14.1, areas of the inner rectangles won't be equal as between the left-hand (seller) and right-hand (buyer) panels), but the intertemporal principle of transactional equity posits the accumulation of capital embodied in the transaction at *PV* at time *0* as being in equilibrium at the end of the projection/analysis period (i.e., at $t=n$), that is, the outer rectangles on each panel in Fig. 14.1 are assumed to be strictly equal in area

future as the combined option of (1) keeping the asset to themselves and thus earning a future stream of NOI_i and (2) having the right to sell the asset sometime in the future (in the year n) over its economic life (i.e., the principle of equivalence of interests or "the principle of fair exchange").

Thus, both potentially transacting agents – the seller and the buyer – will regard the following dynamic "transactional equilibrium" condition as equitable (see Fig. 14.1):

$$S_n^s = S_n^b \tag{14.1}$$

where S_n^s is the amount of capital in an "investment opportunity set" available to the selling agent ("seller") in Year n after the deposition into it[2] of the proceeds PV from the assets' disposal at time 0 and S_n^b stands for the amount of capital in Year n accumulated by the counterparty (buyer) as a result of the ownership interest in the purchased asset (the sum of their future $NOIs$ up until Year n which they reinvest with reference to their "Investment opportunity set"/investment benchmark plus the residual value of the asset in the Year n which can be converted into cash). If the considered transaction takes place, prudent seller will invest their transaction proceeds PV according to opportunities offered by the "investment sets"/ benchmarks of their choice, where the proceeds will start accumulating due to reinvestments of the accrued annual interest (yield) up until Year n:[3]

$$S_n^s = PV\Pi_{i=1}^n(1 + r^s(i)) \tag{14.2}$$

where $r^s(i)$ is the annual rate of return for year i ($0<i\leq n$) arising from the seller's "investment opportunities set." Prudent buyer is able to obtain similar investment advantages by investing into their own "investment opportunity sets" their annual operating income NOI_i ($0<i\leq n$) arising from the purchased subject asset, so that their initial transaction-related capital $S_n{}^b$ by the end of Year n, along with the residual value of the asset now in their possession S_{res}, equals:

$$\begin{aligned} S_n^b &= \sum_{k=1}^{n} NOI_k \Pi_{i=k+1}^n \left(1 + r^b(i)\right) + S_{res} \\ &= NOI_1 \cdot \left(1 + r^b(2)\right) \cdot \left(1 + r^b(3)\right) \cdot \ldots \cdot \left(1 + r^b(n)\right) \\ &+ NOI_2 \cdot \left(1 + r^b(3)\right) \cdot \left(1 + r^b(4)\right) \cdot \ldots \cdot \left(1 + r^b(n)\right) + \ldots \\ &+ NOI_i \cdot \left(1 + r^b(i+1)\right) \cdot \left(1 + r^b(i+2)\right) \cdot \ldots \cdot \left(1 + r^b(n)\right) + \ldots + NOI_n + S_{res} \end{aligned} \tag{14.3}$$

where $r^b(i)$ is the rate of return applicable to the buyer's benchmark investments. By combining expressions (14.1), (14.2), and (14.3), we can derive, through the "transaction based perspective," a value-in-exchange for the asset, which would be "fair"/ "equitable" (in IVSs 2020 sense) from both the buyer's and the seller's standpoints:

[2]The notion of an "Investment medium" implies an appealingly profitable and equally accessible investment opportunity to both parties to the transaction (a bank deposit, setting up a new business, investing in a securities portfolio, real property, reinvesting back into expansion of the business with subject asset, etc., or the mixture of all those options, i.e., an investment portfolio). Another kindred term is the notion of "Investment opportunity," one that I. Fisher uses in his "Theory of Interest" (1930) though in a more specific context laden with optionality considerations. Generally, in a TAPA application context, it makes sense to speak of an "Investment benchmark," i.e., that comparative/opportunity investment environment again which the valuation is to be rendered.

[3]$\Pi_{i=1}^n(1 + r^s(i))$ means the product (chain multiplication) of the yields for each year from 1st to n-th, i.e., the expression (2) can be recast as: $S_n{}^s = PV((1+ r\,(1))^* (1+ r\,(2))^* (1+ r\,(3))\, ^* \ldots ^* (1+ r\,(n)))$

$$PV = \frac{\sum_{k=1}^{n-1} NOI_k \Pi_{i=k+1}^{n} \left(1 + r^b(i)\right) + NOI_n}{\Pi_{k=1}^{n}(1 + r^s(i))} + \frac{S_{res}}{\Pi_{k=1}^{n}(1 + r^s(i))} \tag{14.4}$$

The rates of return in Equation 14.4. $r^s(i)$ and $r^b(i)$ may not match closely, for the probability that both the seller and the buyer will invest their proceeds/income into exactly the same investment opportunity sets, with similar interest accruing to them, is not very high. We explore the case of the resulting asset pricing equation where the buyer's and seller's rates diverge more in-depth in Michaletz and Artemenkov (2019). This exploration yields a novel more general case of the extant DCF framework with dual rates of return. For the current purposes of exposition, we are interested in deriving a conventional case for the single-rate DCF framework. Thus we make an assumption that if a willing and able buyer and seller enter into a transaction on arm's-length terms and both parties have reasonable knowledge of the relevant facts, it is by no means unreasonable to assume that the rates of return pertaining to both parties will tend to converge to a certain most likely estimates that characterize the common investment valuation benchmark selected for the pricing process: $r^s(i) = r^b(i) = r(i)$ (cf. with the homogeneity-of-expectations assumption when deriving the CAPM – see Dawson (2015)). This in turn implies that the conventional DCF analysis has this strong implicit assumption whenever it is used for market or fair/equitable value valuation situations, namely, that both rates of return are uniform as between the buyers and sellers: $r^s(i) = r^b(i) = r(i)$. Indeed, after substituting this assumption, Formula (14.4) simplifies into the following:

$$PV = \sum_{k=1}^{n} \frac{NOI_k}{\Pi_{i=1}^{k}(1 + r(i))} + \frac{S_{res}}{\Pi_{i=1}^{n}(1 + r(i))} \tag{14.5}$$

This is the well-known formula always used in the DCF analysis/calculations[4], though its justification is more often formulated axiomatically from the principle of anticipation or the investment worth paradigm (well formulated by Fisher (1930)) or, otherwise, deduced from the relational definition of discount rate in a static perfect market setting, as in Miller and Modigliani's (1961; Formulas (1–10)), rather than from the "transactional equilibrium/equity based view" proposed above – which places Formula (14.5) as a specific case of a more general Formula (14.4) situation.

Leaving the general "Formula (14.4)" case aside, we shall further pursue implications resulting from the consideration of the "Formula (14.5)" setting.

The uniform rate of return $r(i)$ in Formula (14.5), by its nature, is nothing other than the proverbial discount rate. And it is fair to say that there exists no other

[4]It is often the case that conventional DCF framework uses constant discount rates in the denominators of the terms, instead of time-variable ones. Therefore, in such specific instances, the time factor enters as an exponent in the denominators of the formula terms, not as a direct multiplication chain (Π), as presented here. In this chapter, though, we aim to illustrate a more general mathematical case of the DCF framework.

element in asset valuation more mystifying than that. It follows from our discussion that the discount rate for an exchange valuation of assets in the TAPA transactional setting is by its nature dependent upon, and firmly linked to, the ex ante rate of return on an *investment opportunity set/ benchmark which the specific, or most likely, transacting parties with the subject asset choose to select.* These benchmarks can either be more or less "broad" and diversified investment portfolios[5] of the parties (when an investment portfolio is selected as the valuation benchmark, e.g., in an equitable/fair value determination context) or represent their opportunity investments (when a particular market/market niche (as in Slee (2004)) is selected to serve as a valuation benchmark, e.g., in a market value-based standard of valuation). Thus, the notion of "investment benchmark" is situational and depends on the purpose of valuation and the basis of value sought. It originates from the fact that any valuation within any valuation approach – be it the market approach, the income approach, or the cost approach – is a *comparative exercise* by its very nature. In TAPA, the investment benchmark represents a comparison entity (subject asset's reference market or an investor's investment portfolio) against which the valuation shall be rendered/benchmarked.

TAPA Discount Rate Theory with Single- and Multi-period Formulations

As presented in the foregoing section, the discount rate *r(i)* is the rate of return (in Year *i)* for an investment benchmark used by the transaction participants (buyers and sellers of the subject asset). Below we shall progressively develop a formula for discount rate derivation under TAPA starting from a trivial single-period case well researched in the appraisal and investment literature and then generalize the derivations to a multi-period setting – allowing us to directly obtain novel research results for discount rate derivation in the multi-period setting.

Single-Period Single-Asset Benchmark Situation

If an investment benchmark is comprised of a single (income-producing) asset *s*, the overall rate of return on such an asset will be constituted of (1) the current income

[5] Unlike the MPT research framework, TAPA implies no normative theory of the portfolio selection, and the portfolio composition is viewed as it is, or as it is projected to be, by the transacting agents valuing the asset in question.

component (yield) and (2) a "capital gain/loss" component, being a capital-appreciation/depreciation expectation for the asset constituting the benchmark[6]:

$$PV_s + \Delta PV_s + NOI_s = PV_s \cdot (1 + r_s). \tag{14.6}$$

Here by PV_s we denote the beginning-of-period capital value of the benchmark asset (howsoever measured).

Dividing the right- and left-hand side of the equation (14.6) by PV_s, we derive the *discount rate* r_s or the *rate of return* on an opportunity investment(s) (in this instance the single-asset benchmark). Thus:

$$r_s = \frac{NOI_s}{PV_s} + \frac{\Delta PV_s}{PV_s} = R_s + v_s, \tag{14.7}$$

where by R_s we denote nothing but the *yield* that characterizes the income-generating capacity of an (income-producing) benchmark asset (asset s) expected from it over the first period and v_s is the expected growth rate in the value of the asset (positive or negative).

One often comes across the expressions (14.6) or (14.7) in valuation and financial theory texts (see, e.g., Pratt, Reilly and Schweihs 2000, p. 160). According to Rubenstein (2003), the expressions are originally traceable to Myron Gordon and Eli Shapiro by whom they have been popularized in the presented form among the investment profession in the middle of the last century. But most of such texts usually do not elaborate the discount rates beyond the basic concept manifest in the presented one-period single-asset model (Formula (14.7)), so extending it to cover a multi-asset (portfolio) situation and more periods will produce some interesting findings, as shown in Michaletz and Artemenkov (2019). Such an extension makes the discount rate model directly applicable in practice since it will offer a reasoning framework which will allow evaluating/forecasting discount rates related to future periods. In contrast, one-period models such as (14.6) and the Capital Asset Pricing Model (CAPM) (Sharpe, 1964) occasionally used with adjustments to value

[6]The formula is quite general, regardless of how the asset is held and who owns it. For the assets' buyer, it means that their overall periodic return from the subject asset is a combined effect of the appreciation (or depreciation) in the value of the asset ΔPVs and the current income NOIs generated by the asset during the period.

As for the seller, a similar notion is also true. Assume that they invest their proceeds PVs from selling the asset into stocks; therefore, their return over the next year will come in two forms: appreciation (or fall) in the value of the stocks plus the dividend received. Thus, conventionally it is a convenient procedure to split returns from any income-producing assets into two factors: the current component on account of the periodic income (yield) and the capital component (a gain, or a depreciation). However, in specific cases (such as when dealing in instruments that are not income-generating, viz., gold or commodities) NOIs might be left out of account. The expression (6) allows to visualize the general meaning of the discount rate as used in the valuation practice and tie it up with the ways in which the asset performance is gauged by investors.

institutional real estate are, in fairness, devoid of direct practical forecasting and professional valuation capabilities[7], since the DCF technique is inherently a multi-period one and doesn't square well with single-period-only forecasts.

Multi-period Multi-asset Benchmark Situation

Extending (14.6) over an assemblage of assets $s = 1 \ldots n$ (portfolio) and across periods $j = 1 \ldots i$ (forecast horizon, holding period), we can establish the discount rates for periods that lie ahead if we consider the following framework of change in the value and derivable income:

Single asset s, Period i. Reasoning by induction from (14.6), we establish how to evaluate the asset's rate of return $r_s(i)$ related to a period i:

$$PV_s \cdot \prod_{j=1}^{i} (1 + v_s(j)) + NOI_s \cdot \prod_{j=1}^{i} (1 + u_s(j)) = PV_s \cdot \prod_{j=1}^{i-1} (1 + v_s(j)) \cdot (1 + r_s(i)). \tag{14.8}$$

Now, generalizing Expression (14.8) across an assemblage of assets $1 \ldots s$ constituting the benchmark valuation portfolio by applying averaging, we are able to derive evaluation formula for the benchmark portfolio rates of return/discount rates for (any) forecast period i:

$$\sum_{s=1}^{n} PV_s \cdot \prod_{j=1}^{i} (1 + v_s(j)) + \sum_{s=1}^{n} NOI_s \cdot \prod_{j=1}^{i} (1 + u_s(j)) = \sum_{s=1}^{n} PV_s \cdot \prod_{j=1}^{i-1} (1 + v_s(j)) \cdot (1 + r_s(i)). \tag{14.9}$$

Finally, to infer out of Expression (14.9) $r(i)$ – an expectation of *multi-asset benchmark* discount rate related to period i – we substitute the aggregate multi-period performance metrics for individual assets in the benchmark (marked by subscript s) by their weighted averages. Thus, by using averages we avoid the need to keep in mind all chains/products of individual growth variables (subscripted with s) so that our upcoming modeling becomes easier on the aggregate level.

The following notation is used in averaging:

[7] Note manifold "adjustments" usually introduced to CAPM results when the CAPM model is used for forecasting purposes, e.g., see Mercer (2004) and Slee (2004). Such adjustments are contrary to the spirit of the CAPM model itself and are meant to bear an ad hoc nature to make the model results conformable to the practical pricing situations.

$$\prod_{j=1}^{i}(1+v(j))=\frac{\sum_{s=1}^{n}PV_s\cdot\prod_{j=1}^{i}(1+v_s(j))}{\sum_{s=1}^{n}PV_s}, \tag{14.10}$$

In effect, the individual asset capital value growth projections are value-weighted by their *PVs*.

By the same token:

$$\prod_{j=1}^{i}(1+u(j))=\frac{\sum_{s=1}^{n}NOI_s\cdot\prod_{j=1}^{i}(1+u_s(j))}{\sum_{s=1}^{n}NOI_s} \tag{14.11}$$

Here the value-weighting is assumed to be by *NOIs*, not *PVs*.

It has been shown (see Michaletz et al. (2007), Michaletz & Artemenkov (2019)) that on a portfolio level Expression (14.9) can be solved for the year-contingent *portfolio discount rate r(i)* in the following way:

$$r(i)=\frac{R\cdot\prod_{j=1}^{i}(1+u(j))}{\prod_{j=1}^{i-1}(1+v(j))}+v(i), \tag{14.12}$$

where *v(j)* and *u(j)* are, respectively, the forecast averages of the growth in capital values and incomes expected for assets constituting the benchmark over period *j* (either synthetically derived, as shown, from the forecasts of separate data for the respective assets in the portfolio/reference market or suggested aggregately by an analyst (as shall be illustrated in the property valuation example that follows in section "An example of property valuation under TAPA's basic pricing equation")) and *R* is the aggregate yield projected for the benchmark for Period 1 (the end-of-period values are used for *NOIs*, and the beginning-of-period values are used for *PVs*):

$$R=\frac{\sum_{s=1}^{n}NOI_s}{\sum_{s=1}^{n}PV_s}. \tag{14.13}$$

Thus, we find that the benchmark discount rate expectation for Period *i* depends on the initial (Period 1) portfolio yield and the cumulative expected rates of growth in capital values and incomes for assets constituting the benchmark up until, and including, Period *i*.

To avoid a confusion with the marking of intervals (taking into account that $u(1)=0$), since the end-of-period *NOIs* are to be used within R), we can transform Formula (14.12) as follows:

$$r(i) = \frac{(1+u(i)) \cdot R \cdot \prod_{j=2}^{i-1} (1+u(j))}{(1+v(1)) \cdot \prod_{j=2}^{i-1} (1+v(j))} + v(i). \tag{14.14}$$

Formula (14.14) represents an extension of the basic well-known (14.6) and (14.7) analytical expressions for a multi-period multi-asset situation. To our knowledge, this is a novel analytical expression. In continuous time, Expression (14.13) can be recast as:

$$rn(t) = R \cdot \frac{e^{\int_{to}^{t} u(\tau)d\tau}}{e^{\int_{to}^{t-1} v(\tau)d\tau}} + v(t) \tag{14.15}$$

where $rn(t)$ is the continuous-time (instantaneous) discount rate and $v(t)$ and $u(t)$ are now regarded as continuous-time functions, not as discrete variables; values of t are now any positive real numbers, not necessarily integers; τ is an infinitesimal of time within the respective period of integration [8].

Expression (14.14), like its continuous-time counterpart (14.15), is reducible to simpler forms, subject to certain simplifying assumptions. For example:

(i) If it is possible to assume that the future benchmark-related rates of growth in capital values and incomes are expected to be uniform over a number of periods up until (i), e.g., that they are time-invariant, formula (14.14) can be simplified in this way:

$$r(i) = \frac{R \cdot (1+u)^{i-1}}{(1+v)^{i-1}} + v. \tag{14.16}$$

where v and u are the uniform rates of growth in capital values and incomes (respectively) anticipated for the overall benchmark over the periods $1 \ldots i$.

[8] In the instance of time-variable discount rates $rn(t)$, such a neat standard dependency between the instantaneous (continuously compounded) discount rate, rn , and its discrete-period counterpart, r , as $rn = ln(1+r)$ is not obtainable, because in this instance the continuous discount rate is a function of time, thus requiring being appropriately integrated over time.

$r(i)$ – is the expectation of the benchmark rate of return/discount rate for period i.

(ii) if the assumption above is untenable, but we expect that capital values and incomes for the benchmark will move in the lockstep ($v(i)=u(i)$), the following simplification is true:

$$r(i) = \frac{(1 + v(i)) \cdot R}{(1 + v(1))} + v(i). \tag{14.17}$$

And, finally, if both assumptions are held reasonable ($v=u$), the following will apply:

$$r = R + v. \tag{14.18}$$

By marking the discount rate in (14.18) as r instead of $r(i)$, we stress the fact that the benchmark discount rate is expected to be constant over the entire interval of 1...i. periods (such an assumption is indeed the most common one in conventional DCF modelling approaches).

Discount rate is equal to the yield, if it is reasonable to suggest that prices and incomes for the portfolio/benchmark components will stay put over time ($v=u=0$). If anticipated annual rates of change in income are greater than the forecasted rates of price appreciations, i.e., if $u>v$ *for the benchmark*, then overall rates of return/discount will tend to increase with time. Conversely, if a change in income for the benchmark is slower than its corresponding anticipated value change, i.e., when $u<v$, rates of return/discount rates will decrease. If both move in unison ($u=v$), this case represents yet another case when the benchmark-related rates of return/discount remain unchanged over time. Figure 14.2 illustrates some of the mentioned cases with the benchmark income and capital value dynamics.

Thus in summary, we can emphasize the following features of discount rate structure and behavior according to the TAPA:

1. *Discount rate* characterizes the composition and expected performance features of the valuation benchmark used (a reference market, or a specific investor's investment portfolio); it is usually not a property of the subject asset *per se*[9].
2. *Yield* is the measure of an expected current return component (e.g., current rental yield for property assets) pertaining to the valuation benchmark in the first period

[9]For example, contrary to sometimes prevalent valuation practices, it appears a doubtful proposition to have to incorporate into the discount rates such a universe of often unquantifiable factors as manifold "property-specific risks." These factors impact upon growth prospects of a particular property and, as we have shown above, should not be commingled with the "metric" of discount rates representing the expected economic performance of a valuation benchmark chosen (by a valuer/principal) for the subject asset. We believe such a recurring sentiment is reiterated within the International Valuation Standards (IVSs) and European Valuation Standards (EVSs) where it says that discount rates should be "market-derived."

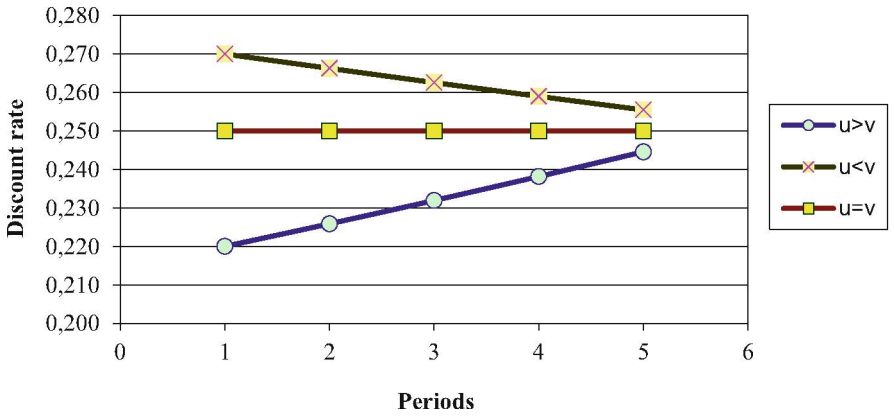


Fig. 14.2 Trends in anticipated portfolio rates of return (discount rates) depending on the portfolio dynamics of price and income of its components

after the valuation date. While the subject asset is often presumed to be an (illiquid) property (or one valued in the context of an inefficient market[10]), the benchmark could be an investor's portfolio consisting of both liquid and illiquid investments or some open reference market, depending on the basis of valuation used and a valuation context implied. Valuers should reflect on the composition and scope of the reference market (the market value basis of valuation) or on the composition of portfolios of *specific* buyers and sellers (the equitable/fair value basis of valuation). In the area of illiquid asset valuation, which is a characteristic work of the professional asset valuers, it is not always possible to fall back on any normative theory of portfolio/benchmark composition (Hoesli and Macgregor 2013; Dawson 2015).

3. It is also possible to provide formulations for the discount rate derivation model under TAPA in continuous time. In this case, a number of (rather-complicated) formulations for $rn(t)$, the continuously compounded (instantaneous) time-contingent discount rate, will emerge.
4. A non-trivial property of valuation-related applications for the discount rate formulas (14.12) and (14.14) and other more general dual-rate formulas obtained within TAPA (Michaletz & Artemenkov (2019)) is their apparent valuation *counter-cyclicality (*through a *negative feedback loop* they create in the context of a DCF-based valuation process). Since a discount rate enters as the denominator in the CF terms under the DCF analysis for income-producing properties, thus, due to the effect of inverse proportionality, any anticipated acceleration in the capital value growth ($v(i)$) for the selected valuation benchmark/market,

[10]Obviously, on efficient markets, by definition, there is no need for the functions of professional valuers, as the entire market information set is presumed to be known in equal measure to all market participants (Fama, 1968).

refracting through the use of benchmark-related *time-variable* discount rate, translates into a diminution of the value contributions of the periodic incomes (and/or the residual value) from the subject property (or otherwise – in case of a declining valuation benchmark in capital value terms). Thus, it is the potentiality of the use of such *time-variant* discount rates under the TAPA that endows the entire structure on which the TAPA approach to valuation is based with evident counter-cyclical valuation properties, broadening the relevance of TAPA for the property fundamental value (MLV) debates.

Having regard to the above remark, in the next section, we proceed to explore more in-depth the conjunction of the derived discount rate formulas with the general DCF pricing framework, allowing to use TAPA for diverse asset pricing situations, including income-producing commercial property. As a methodological novelty, the next section contains a review of the TAPA DCF framework where the residual/terminal values are proportioned to the initial values of subject assets being sought, i.e., the DCF analysis is being recast as an explicitly circular equation. This sheds a new light on well-known abbreviated income capitalization formats (i.e., the direct income capitalization (DIC), the Gordon growth model, Inwood, and Ring), as well as allows to propose novel income capitalization formats (e.g., see Michaletz & Artemenkov 2018, 2019).

TAPA DCF: Derivation of TAPA's Basic Pricing Equation (BPE) and Its Reductions to Some Conventional Income Capitalization Formats

TAPA's DCF Equation (14.5) has already been derived above in a sui generis way relying on the principle of transactional equity. As under the conventional DCF analysis framework, the subject asset value-in-exchange is contingent on the discounting of subject asset's net operating income stream (*NOIs*), as well as of its residual value following the termination of the analysis/projection period. Now, the residual value can be "endogenized" (converted into a relative growth variable) by linking the residual value of the subject asset (*Sres*) with its present value sought (*PV*) via an imputation of the subject asset's growth rates; i.e., introducing the circularity[11] into the pricing Equation (14.5), the latter can be rewritten as:

$$PV = \sum_{k=1}^{n} \frac{NOI \cdot \Pi_{i=2}^{k}(1+u_o(i))}{\Pi_{i=1}^{k}(1+r(i))} + \frac{PV \cdot \Pi_{i=1}^{n}(1+v_o(i))}{\Pi_{i=1}^{n}(1+r(i))}, \tag{14.19}$$

[11] Pricing equations with circularity may look unusual; however, there are multiple precedents for their use, e.g., in derivation of the Ellwood formula; e.g., see Lombardo (1998).

where u_o and v_o are the *subject asset-specific* rates of change in its future *NOIs* and capital values, respectively. These should not be confused with u and v (introduced in section "TAPA discount rate theory with single- and multi-period formulations") that reflect similar rates of change, but those expected to be observed for the selected valuation benchmark. The latter rates are implicitly incorporated into (14.19), since the discount rates *r(i)* included in (14.19) are inserted from (14.14), where they are based on the expected benchmark-related growth rates u and v as discussed in the previous section.

Formula 14.19 is the TAPA's Basic Pricing Equation (BPE). BPE is amenable to multiple reductions into the well-known compressed income capitalization fomats (i.e., the direct income capitalization (DIC), Gordon growth model, Inwood, Ring), with such reductions having novel untraditional features (see Michaletz et al. 2007; Michaletz & Artemenkov (2019) for details).

For example, to reduce the BPE formula (14.19) to some more conventional valuation formats, we assume that the rates of change in *NOIs* and capital values for the subject property (u_o and v_o) are time-invariant (i.e., constant with time), which is the usual assumption underlying conventional DCF analyses in the majority of valuation-related applications, where DCF is employed. Then we can simplify the BPE expression (14.19) above as follows:

$$PV = \sum_{k=1}^{n} \frac{NOI \cdot (1+u_o)^{k-1}}{\prod_{i=1}^{k}(1+r(i))} + \frac{PV \cdot (1+v_o)^{n}}{\prod_{i=1}^{n}(1+r(i))} \tag{14.20}$$

Solving (14.20) for the sought-after value-in-exchange of the subject property, *PV*, we get:

$$PV = \frac{\sum_{k=1}^{n} \frac{NOI \cdot (1+v_o)^{k-1}}{\prod_{i=1}^{k}(1+r(i))}}{1 - \frac{(1+v_o)^{n}}{\prod_{i=1}^{n}(1+r(i))}} \tag{14.21}$$

Expression (14.21) is a bonanza for further reductions into some conventional income capitalization models within the income approach to property valuation. For example, using Equation (14.21) with the discount rates calculated under Formula (14.16), indicates that when the rates of capital value/income change for the subject asset and the valuation benchmark are equal between themselves (i.e., the subject asset lacks any asset-specific risks and, as expected, mirrors the market benchmark selected ($u{=}u_o$, $v{=}v_o$)), the market value of the asset will be static over the time and equal to the quotient with the *NOI for the first period* in its numerator and the benchmark yield *R (from* (14.13) in the denominator. In other words, if the valuer feels confident that the rates for "synchronous" subject asset vis-à-vis the valuation benchmark will stay in conjunction ($u{=}u_o$, $v{=}v_o$), they can justify applying the direct income capitalization (DIC) method:

$$PV = \frac{NOI}{R}, \tag{14.22}$$

where *NOI* is the anticipated net operating income generated by the subject asset in the first period after the considered transaction and *R* is a yield likely to be observed for the valuation benchmark over the first forecast period (Formula 14.13).

Formula (14.22) is the case of what, in Professional property valuation, is called the *direct income capitalization technique* whereby subject property is valued by dividing its first-period *NOI* by the reference "yield"/gross rental multiplier. This commercial property valuation technique in which the yield functions as the NOI's capitalization rate (denominator) is very widespread, especially in the Commonwealth countries (Sayce et al., 2006). TAPA approach strictly reduces it to the assumptions just outlined. The wide use of this formula (14.22) using the market yield, it is now clear, rests on the implicit assumption of the lack of subject property-specific risks vis-à-vis the market benchmark adopted (i.e., $u = u_o$, $v = v_o$) or, in other words, that the performance of the market benchmark (to which the yield relates) and that of the subject asset are assumed to be identical. The benchmark market can be raising or falling, in *v* or *u* terms, over the analysis period (likewise always implicit, but not necessarily perpetual, in the DIC method), but what matters to make the method applicable is that the subject property is assumed to rigidly "trail" the market. At the same time, there is no requirement that the respective rates of change for the income (*u*) and capital values (*v*) in the benchmark market should be identical over the analysis period.

Still practicing appraisers are often prone to draw artificial distinctions between the conventional *DCF* methodology (the general case of which is presented in shorthand in Formula 14.20) and diverse income capitalization methods, including the direct income capitalization format (14.22) (e.g., see Sayce et al. (2006) for an attempt to justify the distancing of "market-based" DIC technique from the "investment-based" DCF analysis). As we have just shown, and will show further, all particular income capitalization techniques/methods known under the rubric of the income approach to property valuation are strictly corollaries of the asset pricing Formula (14.20).

A Gordon Formula Version Resulting from TAPA: Making the Case for Its Use in Property Valuation

The TAPA framework is helpful in discovering a novel set of assumptions under which the Basic Pricing Equation (14.20) reduces into an expression resembling the Gordon formula.[12] Below are the assumptions necessary for such a reduction:

[12]Though the Gordon Formula has been known under this name for a long time, Rubenstein (2003) traces the antecedent correct attribution of this formula to *The Theory of Investment Value,* a 1938 volume by John Burr Williams. It is to be said, though, that despite the similarity of the mathematical expression obtained by us, our interpretation of the formula is different.

(i) Income and capital values for the valuation benchmark change in sync and the respective rate of change is uniform (time-invariant) over the implicit forecast period used ($u = v$). This also, according to (14.18), implies that the discount rate over the entire length of the analysis period remains constant and equals: $r = R + v$.

(ii) Net income and capital value for the subject asset are projected, likewise, to move in sync with each other and invariably over time ($u_o = v_o$).

Under these assumptions Equation (14.20) assumes the following form:

$$PV = \sum_{k=1}^{n} \frac{NOI \cdot (1 + v_o)^{k-1}}{(1 + r)^k} + \frac{PV \cdot (1 + v_o)^n}{(1 + r)^n} \tag{14.23}$$

And solving Eq. (14.23) for PV, we obtain an expression identical in structure to the Gordon formula:

$$PV = \frac{NOI}{r - v_o}. \tag{14.24}$$

As can be judged, the presented assumptions are different from those that are put forward in the traditional Gordon Model deductions[13], but the result – the formula itself – is identical in terms of its inputs. Even the conventional derivations of the Gordon formula based on the diminishing geometric progression assumption (which TAPA doesn't imply) allow for the use of negative growth rates in the formula's context. TAPA's derivation is no exception in this matter. So a case can be made for a wider use of the Gordon formula in an income-producing property valuation contexts and to "uniformly wasting assets" generally. As with DIC (Formula 14.22), an analysis/forecast period is implicit in the presented Gordon formula version (it is not necessarily a perpetuity, under TAPA). Therefore, it is possible to apply Gordon formula not only for the "going concern" premise of valuation as Gordon does but also extend it to cover other premises of valuation that take account of a voluntary-chosen finite holding period and residual value at the end of it, as per the TAPA assumptions.

Recalling that according to the assumptions for the Gordon formula in TAPA: $r = R + v$, we can rewrite the formula as:

$$PV = \frac{NOI}{R + v - v_o}. \tag{14.25}$$

[13] For example, see https://en.wikipedia.org/wiki/Dividend_discount_model. An alternative derivation of the Gordon formula, which resembles one proposed under TAPA, has also been developed independently from us in Prof. L. Leyfer's Paper (Leyfer, 2006). Another attempt to create a "dynamic" version of Gordon formula is An and Yongheng (2009).

If the subject asset is expected to perform worse than the valuation benchmark in terms of its capital value/income growth characteristics, i.e., if $v>v_o$, its value-in-exchange, *PV,* will be smaller than the average value observable for assets forming the valuation benchmark that should be calculated under the direct capitalization (DIC). What is more, Formula (14.25) explains why it is hardly conceivable for the value of subject asset to be negative (or tend to infinity): for this to happen it is necessary that the difference between the subject asset's and the benchmark growth $(v^o\text{-}v)$ be so huge as to exceed R. When this is the case, it should be clear that the benchmark is not correctly identified for such an extraordinary dynamic asset, or such asset is entirely *sui generis* to be identified with any relevant benchmark[14] and forms a "benchmark" of its own. The formalism of conventional derivations for the Gordon growth formula is, on the other hand, less clear about the reasons why the "value hyperbolism" implicit in the Gordon formula is a rarely observed bothersome phenomenon in practical terms when the formula is to be used. With the decomposition of discount rates suggested by the TAPA for a multi-period setting, we, therefore, rigorously understand that the denominator of the Gordon formula has certain countervailing properties in terms of accounting for growth: the growth rates for the benchmark market (v) and the subject property (v_o) are accounted in the formula with different signs, such as only a differential between them is meaningful for the valuation.

The presented version of the Gordon formula, when used in the property valuation context, will allow to account for property-specific risks (conceptualized in terms of the growth disparity vis-à-vis the valuation benchmark: $v_o\text{-}v$), but at the cost of an assumption of the synchronicity of change as between income and capital values both for the subject asset ($u_o = v_o$) and also its benchmark ($u = v$). However, this restrictive assumption hardly gives reason why the presented interpretation of the Gordon formula, with its perpetuity assumption not an issue under the TAPA, should not be used for valuing income-producing property assets – especially against the backdrop of such a widespread use of the Direct Income Capitalization (DIC) format for property valuation. After all, using constant discount rates for a multi-period setting is considered normal in the valuation practice of the day.

TAPA-Based Derivations of Other Income Capitalization Models

As explained in Michaletz and Artemenkov (2018) and (2019), apart from the direct income capitalization (DIC) and the Gordon formula format, TAPA's BPE (14.19) is also reducible to other well-known and occasionally used income-capitalization formats, such as the Inwood, Hoskold, and Ring income capitalization models.

[14] Indeed, it is becoming permissible (according to the IVSC) to view one-asset markets as such. Refer to p.4b of the following IVSC letter: http://www.ivsc.org/pubs/comment/2006may-cica.pdf).

Conventional derivations of these models imply an actual formation of sinking funds by property managers. However, under TAPA no such literal assumption is required (Table 14.1).

An Example of Property Valuation Under TAPA's Basic Pricing Equation

Applying TAPA to property valuation can be a relatively straightforward exercise, as long as a suitable valuation benchmark is decided upon and its performance projected for the chosen forecast period. But a few caveats are in order as to the general applicability of TAPA in the property valuation context. From a theoretical standpoint, TAPA is a suitable approach to valuing investments with less than perfect liquidity, especially for equitable/fair valuation contexts (e.g., for negotiations of commercial property sales, or any other instances where the implied transactional perspective would be clearly understood by the parties and relevant to their interests). However, the selection of suitable valuation benchmarks for real estate valuation contexts is still bound to pose a problem. This is due to the fact that the work on rental and repeat-sales indices for property markets is still a recent phenomenon internationally, and the required data sets are seldom available in their entirety for specific metropolitan areas (with a possible exception of the US statistics). Therefore, the example below utilizes the perspective of a national, not a metropolitan, property valuation benchmark.

The general algorithm for TAPA's use in a property valuation context would be as follows:

1) Identify the benchmark of valuation, a portfolio (the buyer's or seller's, standardized market participant's or some other reference portfolio of assets), or – for market value situations – a reference market (for which type of property? And what geographical scope: national, regional, or metropolitan?). Given the publicly available data, our example first uses the national reference market for the entire US residential (housing) property. However, as property indices develop and become available on the metropolitan area basis (especially with respect to rent-to-price ratios), the use of more fine-grained indices for valuation benchmarks can only be encouraged.
2) Select the ***forecast period*** for the benchmark and the subject asset (n); for ease of representation on the print page, we opt for the use of a 6-year forecast period.
3) Identify the assumptions/expectations as to the current yield (R) and rates of growth dynamics for *the valuation benchmark* ($\boldsymbol{v}$ -s and $\boldsymbol{u}$ -s) – specifically, should v-s and u-s be modelled as time-variable ($\boldsymbol{v(i)}$, $\boldsymbol{u(i)}$) or time-invariant ($\boldsymbol{v}$, $\boldsymbol{u}$) and be considered out of equilibrium with each other or otherwise? (e.g., if such simplifying assumptions as $\boldsymbol{v(i)}=\boldsymbol{u(i)}$ or $\boldsymbol{v}=\boldsymbol{u}$ may be deemed applicable?); our example eschews the use of such simplifying assumptions in order to illustrate the general potential and scope of the TAPA Basic Pricing Equation (BPE) (Formula 14.19).

Table 14.1 Assumptions used to derive particular income capitalization formats under TAPA

Model	TAPA-based derivation assumptions			Conventional derivation assumptions
	Subject asset net income over time	Subject asset residual value at the end of the projection period (n-th year)	Benchmark assumptions	
Direct income capitalization $PV = \frac{NOI}{R}$	Changes synchronously with the income for the benchmark $u_o\,(i) = u(i)$	Changes synchronously with the benchmark capital values $v_o\,(i) = v(i)$	$u(i)$ can be independent from $v(i)$; both can be time-variant	*Strictly:* Income perpetuity without growth; *In actual valuation practice*: a multitude of implicit factors are assumed to be accounted for in R, which results in the commingling of the pure yield metric with the capitalization rate
Gordon $PV = \frac{NOI}{r-v^o}$	$NOI \cdot (1 + v^o)^{i-1}$	$PV \cdot (1 + v^o)^n$	$r=R+v$ when $u=v$	A perpetuity with a fixed growth rate (either positive or negative)
Inwood $PV = \frac{NOI}{r+F3(n,r)}$	Constant	$= 0$	$r=R+v$ when $u=v$	Assumption about the actual use of a sinking fund, the performance of which is determined by the sinking fund factor $F3(n,r)$*
Inwood – extended $PV = \frac{NOI}{r+V \cdot F3(n,r)}$	Constant	$PV \cdot (1\text{-}V) > 0$	$r=R+v$ when $u=v$	Assumption about the actual use of a sinking fund, the performance of which is determined by the sinking fund factor $F3\,(n,r)$*
Ring $PV = \frac{NOI}{r+\frac{t}{n}}$	Decreasing: $NOI_i = NOI \cdot \left(1 - \frac{\frac{t}{n}}{r+\frac{t}{n}}(i-1)\right)$	$= 0$	$r=R+v$, when $u=v$	Assumption about the actual use of a sinking fund on a non-compounded basis. According to Ellerman (1994), an assumption is made about "foregone income," but short of assuming any "actual" decline in the subject property's $NOI(i)$ income

Note: * $F3(n,r) = \frac{r}{(1+r)^n - 1}$ - is a sinking fund factor (SFF) formula

4) Project the expected valuation parameters for the subject property – depending on the model to be used according to step 5 (for the general TAPA BPE – v_o and u_o *subject asset* assumptions will be required for each period $i=1...n$.);
5) Select an appropriate discount rate and income capitalization models in the light of findings under steps 3–4 – if no simplifying assumptions are possible, use the general TAPA BPE (as we do in our example below).
6) Get the TAPA valuation, and subject the results to scrutiny and sensitivity tests of assumptions (e.g., change n, select other growth assumptions for the benchmark, or even change the benchmark of valuation) – the TAPA approach is fully compatible with the scenario analysis and the incorporation of related risks.

To illustrate the algorithm above, in the example below, we opted for the use of the Lincoln Institute of Land Policy datasets for the national US residential (housing) market (compiled on the basis of both Case-Shiller and FHFA indices). The forecast period chosen is $n = 6$. The valuation date for a notional subject property[15] with the first-period gross annual income of $ 10 000 is April 1, 2020.

Below we reproduce the historic values for data required for our valuation analysis (see Figs. 14.3, 14.4 and 14.5).

Figure 14.3 illustrates the gross rent-to-price ratio observed for the overall American housing market. The relative stability of these series illustrates that the use of (gross) yield $R = 4\%$ per annum for the national valuation benchmark will be deemed reasonable.

Figure 14.4 illustrates quarterly change in the index of housing rentals for the USA, developed as a component part of the national consumer prices inflation (CPI) index[16] – in terms of our notation, this translates into the rates of change in the benchmark income (i.e., historic $u(i)$ series, which are required for our analysis to develop $u(i)$ forecasts for the selected valuation benchmark).

As can be seen from Fig. 14.4, in later years the rates of change in (gross) rental incomes for the national US housing market benchmark (historic $u(i) - s$) inch close to 4% in annualized terms, with little variation except for the period immediately subsequent to the financial crisis of 2008–2009. Given the external shock induced by the covid epidemics, which affects the rental housing demand by workers from the affected industries and the unemployed, we can initially assume growth for the housing income in the negative territory for the national benchmark going forward, say, the first-forecast-period (year 1) rate of growth in income for the benchmark can be assumed at $u(1) = -10\%$ for the period 1Q2020–1Q2021 (which by definition

[15] It is besides the point whether residential properties can be valued using the income approach. The example presented here is for illustration purposes only. And, after all, national income statisticians operating with the System of National Accounts (SNA, 2008 version) have no objections to the practice of imputing rent to owner-occupied housing, as is conventionally done for the USA in the NIPA account context.

[16] A metropolitan-level breakdown for these index series is also available on the St. Louis branch of Fed website: https://fred.stlouisfed.org/tags/series?t=bls%3Bprice%20index%3Brent&ob=pv&od=desc

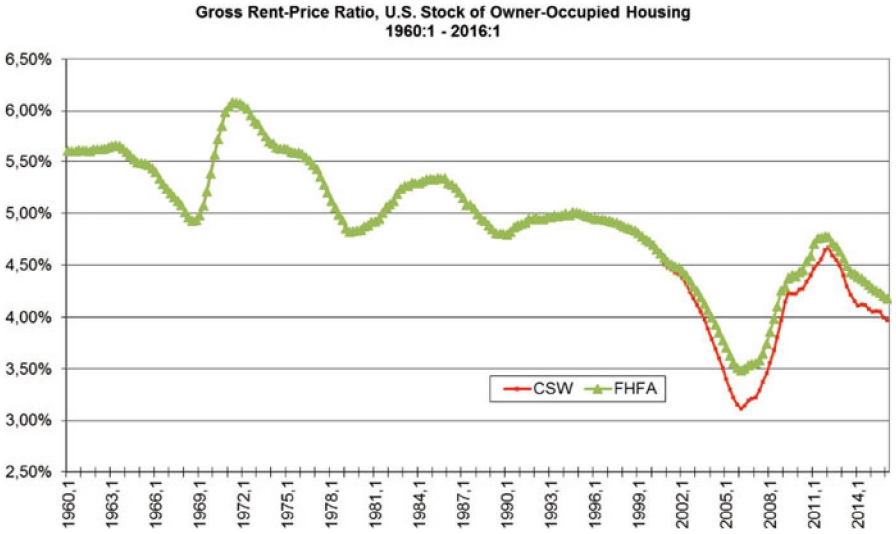


Fig. 14.3 Gross rent-to-price ratio for the US housing market. The last value for 1Q2016 – 3.97% (for CSW) and 4.18% (for FHFA index). (Source: Davis et al. (2008), The Lincoln Institute of Land Policy (2018). https://datatoolkits.lincolninst.edu/subcenters/land-values/rent-price-ratio.asp)
Comment to the Graph: This chart graphs the ratio of the annual rent to price by quarter, starting in 1960:1. After 2000, the red line shows the rent-price ratio when house prices are extrapolated using the Federal Housing Finance Agency (FHFA) – formerly Office of Federal Housing Enterprise Oversight (OFHEO) – "purchase-only" price index. The blue line shows the path of the ratio when house prices are extrapolated using the Case-Shiller-Weiss index. The rental data inputs are gross and do not account for income taxes or depreciation

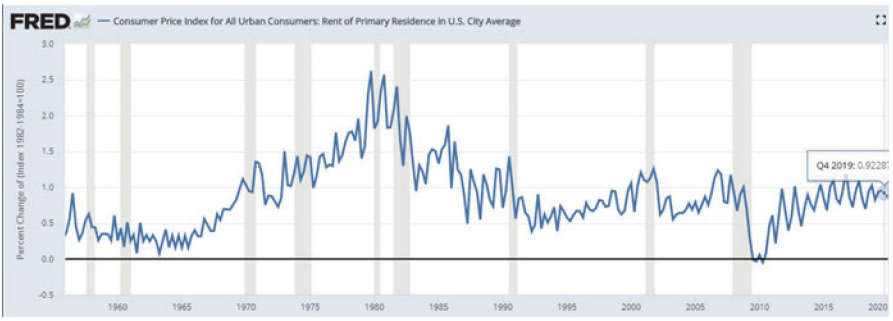


Fig. 14.4 Consumer price index for all urban consumers: Rent of primary residence, published by the Bureau of Labour Statistics (BLS), 1950–2020. (Source: https://fred.stlouisfed.org/series/CUUR0000SEHA)

gets reflected in the yield calculation for R, resulting in the imputation of $u(1)=0\%$ as explained in section "TAPA discount rate theory with single- and multi-period formulations" – see Table 14.2); subsequently, we assume stabilization in the rates of growth for rental income in the benchmark and their near-return to the prevailing historic trends: $u(2)=0\%$ (Year 2021), $u(3)=u(4)=u(5)=u(6)=3\%$ (Years

Table 14.2 Assumed benchmark performance projections ($n = 6$). Benchmark used – the US national housing market (Case-Shiller composite)

Forecast period ($n = 6$ years)	Date of valuation – 1 April 2020	1 2020	2 2021	3 2022	4 2023	5 2024	6 2025
R-benchmark yield	4,00% -national level data for 1Q2016 from Fig. 14.3	4% * [(1,008)^{16} *(1−10%)/ (1,043)^{4}] = 3,46%					
$u(i)$ – projected income growth for the benchmark		−10% (BPE input: 0%)	0%	3%	3%	3%	3%
$v(i)$ – projected capital value growth for the benchmark		−5% (BPE input: 5%)	-3%	-0%	3%	3%	3%

2022–2025). *For the purposes of the example,* these shall be our projections for the rates of change in income for the benchmark ($u(i)$) over the selected forecast period (n=6).

Finally, Fig. 14.5 illustrates the historic capital value trends observed on the US national housing market (i.e., the historic rates of change in capital values for the selected market benchmark: $v(i)$-historic). As can be seen, over the last 5 years, the historic capital value change on the US residential market averaged 4–5%, depending on an exact version of the Case-Shiller index used. Next, we need to develop $v(i)$ forecasts for the benchmark based on these data. It is to be noticed that, lately, following the period of Great Moderation, there are emerging patterns of financial crises erupting regularly after every 7–8 years, with repercussions for the housing market. The latest such crisis has been triggered and amplified by the covid epidemics, whose impact on the market will unfold over a number of future market periods due to the structural weakness in the solvency of tenants employed in the affected industries. Thus, it is not unreasonable to forecast declining capital values for the national property benchmark for a span of a few years. To illustrate analytical capabilities afforded by the TAPA's BPE (Formula (14.19)), we will thus assume a gradual decline in the rates of capital value change for the benchmark: thus, imputing the rate $v(1) = -5\%$ for 2020, rate $v(2)=-3\%$, rate $v(3)=0\%$ for the years 2021–2022, and then some stabilization of the market in line with the rate of general inflation: $v(4)=v(5)=v(6)= 3\%$ (for the years 2023–2025)[17], which covers the assumed projection period of n=6 years in its entirety.

On the basis of these historic data and the resulting projections, as explained, we can project the following performance scenario over the forecast period for the

[17] Those who anticipate no recession on the housing market can also incorporate positive values for the initial forecast $v(i)$ into their benchmark projections and thus develop the valuation on the assumption of a structurally resilient housing market.

Apr 24 2020

S&P CoreLogic Case-Shiller Composite | S&P CoreLogic Case-Shiller Metro Area

S&P CoreLogic Case-Shiller - S&P CoreLogic Case-Shiller Composite

Annualized

Index Name	MTD	QTD	YTD	1 Year	3 Years	5 Years	10 Years
S&P CoreLogic Case-Shiller 10-City Composite Home Price NSA Index	-0.11%	-0.11%	-0.11%	2.56%	3.81%	4.3%	3.89%
S&P CoreLogic Case-Shiller 20-City Composite Home Price NSA Index	-0.04%	-0.04%	-0.04%	3.08%	4.28%	4.84%	4.17%
S&P CoreLogic Case-Shiller U.S. National Home Price NSA Index	0.02%	0.02%	0.02%	3.92%	4.76%	5.02%	3.89%

Fig. 14.5 Historic changes in capital values for the market benchmark used (composite Case-Shiller indices). (Source: CoreLogic/S&P Indices; https://www.spindices.com/additional-reports/all-returns/index.dot?parentIdentifier=6db38316-fd4f-4b21-9db9-61289d88fc9c&sourceIdentifier=index-family-specialization&additionalFilterCondition)

market benchmark adopted – see Table 14.2 (in actual-practice applications of TAPA, multiple valuation scenarios, including the Monte-Carlo simulation approach, would, of course, be advised).

Given that the benchmark yield R is defined in TAPA as the ratio of end-of-period income to the beginning-of-period capital value for the benchmark over Period 1 (Year 2020), while we have only got the data available for rent-to-price ratios underlying R derivations up until 1Q2016 (see Fig. 14.3), it is possible to make updating adjustments to the respective data using the historical ratios for $u(i)$ and $v(i)$ from Figs. 14.4 and 14.5. The adjustment is developed as shown in Table 14.2:

The 1Q2016 rent-to-price ratio for the national index benchmark (assumed to be at 4% from Fig. 14.3), given the availability of quarterly data in Fig. 14.4, is first adjusted for the interim historic change in the benchmark income ($u(i)$-s) via the chain multiplication process (compounding) for 16 quarterly periods (1Q2016–1Q2020) plus the first-forecast-period (year) projection of $u(1)$= −10%[18] and then adjusted for the interim historic change in the benchmark capital values ($v(i)$) via dividing by the compounded 4-year (1Q2016–1Q2020) growth rate (of 4,28% per annum) taken from Fig. 14.5. (note: Fig. 14.5 lists data in the annualized, not quarterly, format). The resulting value of the adjustment from 1Q2016 rent-to-price ratio to 1Q2021 (i.e., the first-forecast-period) yield (R) is minor, as shown in Table 14.3, due to the fact that changes in the benchmark income and capital value indices were unidirectional and almost equal in magnitude in the interim historic period (1Q2016–1Q2020). But in other geographic property markets and historic periods, the adjustment can happen to be a material one, and we have

[18] The rate of change used for it is suggested by Fig. 14.4 to be at around 0,8% per quarter till the end of 1Q2020, and then we assume a drop in $u(1)$ down to -10% in annualized terms (i.e., for the 1Q2020–1Q2021 period) due to the covid-induced external shock of rental demand from tenants.

thus shown how to recalibrate rent-to-price ratios, which can be quarterly ones, as is the case with the Lincoln Institute data, into specific yield measurement convention used within the TAPA.

Above are the projections as concerns the *valuation benchmark* selected. Now, with regard to the *subject property* itself, the valuer has to make the respective projections for its associated income and capital value growth rates ($v_o(i)$ and $u_o(i)$) over the forecast period ($n = 6$ years in our example). In our notional setting, the valuer believes that because of specific conditions attaching to the subject property lease and the reliability of its tenant, its rental income will remain flat over the projection period ($u_o(1)=u_o(2)=\ldots=u_o(6) = 0$); additionally, the geographical area in which the property is located is expected to be less affected by the economic slowdown, and, unlike the expectation for the national valuation benchmark adopted, there is no expectation of decline in the subject property value over the forecast period; indeed, it may even grow somewhat in value in consecutive periods; thus, $v_o(1)=v_o(2)=0\%$; $v_o(3)=v_o(4)=v_o(5)= v_o(6)= 1\%$ – see Lines 1 and 2 in Table 14.3.

All the above inputs are inserted into Formula (14.19), with the inputs and intermediate and final outputs presented as shown in Table 14.3.

The outputs of TAPA BPE (Formula 14.19) shown in Table 14.3 include, inter alia, time-variable discount rates (of −1,5–7% depending on a specific year within the projection period[19]). Also, the value of the subject property returned is $318 222, which on the first-period (gross) operating income of $10 000 assumed indicates the capitalization rate Ro= 1/(318 222/10 000) = 3,14%, compared to the benchmark yield of 3,46%. Thus, as we can see, expected deviations in the subject-property capital value and income performance vis-à-vis the benchmark used (e.g., $v_o\ (i)$ = 0% –1% vs. $v(i)$ = −5%...+3%) in combination have an impact on the adjustment of market-derived yield for valuation practices, even for short projection periods – something that conventional valuations rendered under the DIC method seldom care to account for. The DIC method of valuation, in this instance, yields the result of PV=$NOI(1)/R$= $10000/ 3,46% = $289 017,34 – that result will be exactly replicated if TAPA's BPE (Formula 14.19) is primed with data such that $u_o(i) =u(i)$, $v_o(i)=v(i)$ (i.e., Lines 1–2 in Table 14.3 fully replicate data from the Lines 5–6 there, respectively).

As can also be seen from Table 14.3, predictably enough given the brief projection period adopted, the residual/reversionary value of the property accounts for the greater bulk of its present (date-of valuation) value.

Thus, we have valued a notional income-producing property against a (pan-American) national valuation benchmark (the repeat-sales Case-Shiller for capital value and the BLS rental indices). We agree that choosing a *national*

[19]There is nothing unusual that in consistent deflationary environments the market discount rates can get into negative territories, as this example shows for the Year 1 forecast. Indeed, during solid deflationary situations, the economic direction of time preference changes, e.g., as was known to happen during the period of the Great Depression.

Table 14.3 Priming TAPA's BPE (Formula 14.19)

Line #	Periods, counting forward from the valuation date		1 (1Q20-1Q21)	2 (1Q21-1Q22)	3 (1Q22-1Q23)	4 (1Q23-1Q24)	5 (1Q24-1Q25)	6 (1Q25-1Q26)
1	Anticipated rate of change for subject property income, % per period,	*uo(i)*	0%	0%	0%	0%	0%	0%
2	Anticipated rate of change for subject property value, % per period	*vo(i)*	0%	0%	1%	1%	1%	1%
3	Forecast income from the subject property (for Period 1), $/period	.	10 000	10 000	10 000	10 000	10 000	10 000
4	Forecast value of subject property , $	.	318 222	318 222	321 404	324 618	327 864	331 143
5	Anticpated rate of change for income within the reference benchmark, % per period	*u(i)*	0%	0%	3%	3%	3%	3%
6	Anticipated rate of change in capital values within the reference benchmark, % per period	*v(i)*	-5%	-3%	0%	3%	3%	3%
7	Period 1 Yield for the benchmark *R* (anticipated ratio of the end-of-period income to the beginning -of -period capital values for the benchmark)	3,46%						
8	Chain multiplications for uo (1+ rates of change for subject property income)		100%	100%	100%	100%	100%	100%
9	Chain multiplication for vo (1+ rates of change in value for subject property)	1	100%	100%	101%	102%	103%	104%
10	Chain multiplication for u (1+rates of change in income for the benchmark)	.	100%	100%	103%	106%	109%	113%
11	Chain multiplication for v (1+rates of change in capital value for the benchmark)	1	95%	92%	92%	95%	98%	101%
12	Discount rate (DR), % per period	.	-1,5%	0,6%	3,9%	7,0%	7,0%	7,0%
13	Chain multiplication to derive Discounting factor (1+DR)	1	0,985	0,991	1,029	1,101	1,178	1,260
14	Present value of the subject property income, $	.	10156,409	10091,610	9715,860	9081,651	8488,840	7934,725
15	Present value of reversion, $		0,000	0,000	0,000	0,000	0,000	262753,159
16	**Value-in-exchange under TAPA DCF (BPE), $**	**318 222**						

All the required BPE inputs are marked by yellow-colored cells; intermediate and final model outputs are set in dark-red color

benchmark to value a *local* property can look like a preposterous exercise. It was attempted for illustration purposes only, and benchmarking property valuations against a nearest metropolitan index, of course, makes much more sense. Readers are invited to repeat the same valuation exercise under TAPA with reference to metropolitan indices of their choice. Such indices for at least 20 American

metropolitan areas are available for rental growth data on the St. Louis Fed website[20] and for capital values on the S&P Dow Jones Indices/CoreLogic website (former Case-Shiller data[21]). Readers may also experiment with using metropolitan rent-to-price ratios[22].

As to the question of accounting for subject property performance risks, in practical property valuation applications, it is recommended that subject property values be modelled having regard to the underlying property's income and capital value risks over the forecast period. These risks can be incorporated into the TAPA BPE template by varying $v_o(i)$ and $u_o(i)$ growth rates and Period 1 *NOI* over multiple valuation scenarios (i.e., developing a scenario analysis, including, as a limiting case, the Monte-Carlo simulation statistics[23]). Thus, all sorts of risks can be straightforwardly incorporated into TAPA via an explicit simulation analysis, as shall be explained in section "Accounting for market cyclicality and exogenous market shocks in the TAPA's framework: A study of Mathcad model for TAPA".

Fundamental Value Properties of TAPA's BPE as Suggested by a Portfolio-Level Analysis

Since search for a modern fundamental value paradigm in professional valuation has become a vexed question in the advanced and applied valuation research (e.g., see Crosby and Hughes 2011; RICS 2018), and not just in countries, like Germany, applying the Mortgage Lending Value (MLV) standard, it bears to say a few words on the subject from the TAPA's perspective. The concept of fundamental values implies a search for stabilized dynamically equilibrated market prices for assets; as such this is not a spot, but an inter-temporal basis of valuation recognized in the European Valuation Standards (EVSs) (TEGOVA, 2016), but entirely ignored in the International Valuation Standards (IVSC 2017, 2020). The concept of fundamental values is well-known to financial and equity valuers, even though they still use obsolete and rather static pricing models, such as CAPM, to give it a meaning (see Dawson (2015)). In the property market, this concept still meets a resistance, except in jurisdictions, such as Germany, where a species of fundamental value called the Mortgage Lending Value (MLV) has long been a recognized concept since the WW II.

[20] https://fred.stlouisfed.org/tags/series?t=bls%3Bprice%20index%3Brent&ob=pv&od=desc

[21] https://israel.spindices.com/additional-reports/all-returns/index.dot?parentIdentifier=6db38316-fd4f-4b21-9db9-61289d88fc9c&sourceIdentifier=index-family-specialization&additionalFilterCondition

[22] For the USA, these ratios are, for example, available at this resource: https://www.mashvisor.com/blog/price-to-rent-ratio-by-city-2020/

[23] The modified TAPA BPE spreadsheet for Formula 14.19. which, for practical TAPA applications, incorporates macros-based stochastic features to enable Monte-Carlo simulations, and the resulting value frequency analysis (for 500 runs) is available from the authors upon e-mail request.

Albeit fundamental value models can't account for any specific future exogenous shocks to variables and any forecasting remains but that, lately, a few very promising models of fundamental values for commercial property have made an appearance, such as the Cyclical Yield Capitalization (CYC) (see d'Amato et al. (2019)).

TAPA, as already mentioned in section "TAPA discount rate theory with single- and multi-period formulations" regarding the TAPA's discount rate derivation model, has a number of equilibrating *counter-cyclical* properties when applied to asset valuation – due to the fact that it is amenable to operations with time-variable discount rates. Let's illustrate this non-trivial fact with an example which applies TAPA's BPE (14.19) with the discount rates as derived under (14.12) to valuing a property in the context of a closed-form market aggregate (benchmark), of which such a property forms a part. Let's assume a valuation benchmark portfolio comprised of four (income-producing) properties (s = 1...4) whose performance projection inputs cover five periods going forward ($i = 1...5$). (refer to Formulas 14.12 and 14.14).

Applying formula (14.14) to data from Tables 14.4 and 14.5 to derive the benchmark-portfolio-level discount rates *r(i)*, on the basis of yield estimation, *R* according to Formula (14.13):

$$R = \frac{\sum_{s=1}^{4} \mathrm{NOI}_s(1)}{\sum_{s=1}^{4} \mathrm{PV}_s\,(0)}, \tag{14.26}$$

results in the following estimates for the discount rates sought (*r(i)*)- see Table 14.6.

Next, according to (14.19) we proceed to re-value *each* property *s* ($s = 1...4$) within the benchmark portfolio at the initial moment of time (beginning-of-the-first-period) with reference to that very portfolio benchmark, using the portfolio-level discount rate *r(i)* we determined in Table 14.6:

$$PV_s = \sum_{p=1}^{n} \frac{NOI_s(1) \cdot \Pi_{i=2}^{p}(1 + u_s(i))}{\Pi_{i=1}^{p}(1 + r(i))} + \frac{PV_s \cdot \Pi_{i=1}^{n}(1 + v_s(i))}{\Pi_{i=1}^{n}(1 + r(i))} \tag{14.27}$$

Conducting four such revaluations for *PVs* according to (14.27) (which reproduces TAPA's BPE (14.19)), we can discover a noticeable fact that not only each such revaluation *PVs* will differ from the original value assumed as an input in the right-hand column of Table 14.4 but also that the aggregate benchmark portfolio value, after such a revaluation, will differ from its original one (4787 CUs in the aggregate revaluation vs. *V(0)* = 4600 CUs in the right-hand column of Table 14.6)) – see Table 14.7. What is more, the result of such revaluations (for each property asset separately, as well as for the entire portfolio) remains stable at each next iteration of the revaluation process as described (regardless of the fact that

Table 14.4 Input data assumed for the initial capital values of properties in the benchmark portfolio and the related projections for the capital value growth rates ($v(i)$) for each year of the 5-year forecast period

Assumptions relating to the capital value growth rates for properties s within the benchmark portfolio ($v_s(i)$)						
i-years	$i = 1$	$i = 2$	$i = 3$	$i = 4$	$i = 5$	$i = 0$ (i.e., the beginning of $i = 1$ period)
s – properties:	(capital value growth rates for each of the 4 properties within the benchmark portfolio)					***PVs(0), in CU*:***
1 ((1+v)	1,02	1,03	1,04	1,02	1,07	1000
1 ((1+v)-cumulative)	1,02	1,05	1,09	1,11	1,19	
2	1,04	1,03	0,9	0,94	1,05	1300
2	1,04	1,07	0,96	0,90	0,95	
3	1,04	1,04	1	0,9	1,05	900
3	1,04	1,08	1,08	0,97	1,022	
4	0,97	1,01	1,07	1,04	1,04	1400
4	0,97	0,97	1,04	1,09	1,13	
				V(0) for the portfolio:		**4600**

Source: Michaletz & Artemenkov (2019), Appendix.**CU* currency units

Table 14.5 Input data assumed for the initial income from properties in the benchmark portfolio and the related projections for the income growth rates ($u(i)$) for each year of the 5-year forecast period

Assumptions relating to the income growth rates for properties s within the benchmark portfolio ($u_s(i)$)						For period $i = 1$:
i-years	*i = 1*	*i = 2*	*i = 3*	*i = 4*	*i = 5*	NOIs (1), in CU
	(NOI growth rates for the benchmark portfolio properties))					
s-properties:						
1 (1+u)	1*	1,03	1,04	1,02	1,07	100
1 ((1+u)-cumulative)	1	1,03	1,07	1,09	1,16	
2	1	0,95	0,95	1,04	1	95
2	1	0,95	0,90	0,93	0,93	
3	1	1,04	1	0,97	1,05	110
3	1	1,04	1,04	1,00	1,05	
4	1	1,07	1,021	1,01	0,9	120
4	1	1,07	1,09	1,10	0,99	
			NOI (1) for the portfolio:			**425**

Comment: *The first-forecast-period NOI (NOI(1)), by definition, is assumed to be the starting-level income against which its own growth is projected for the future periods; therefore, $(1 + u_s(1)) = 1$; $u_s(1) = 0$. Source: Michaletz & Artemenkov (2019), Appendix

Table 14.6 Discount rate estimations for the presented benchmark portfolio according to (14.12)

i years	$i = 1$	$i = 2$	$i = 3$	$i = 4$	$i = 5$
Portfolio-level discount rate (1 + r(i)) =	1,106	1,119	1,091	1.073	1,145

Table. 14.7 Results of revaluations for properties constituting the benchmark portfolio against the portfolio according to the TAPA's BPE process

Property, s	Results of revaluations obtained for properties constituting the benchmark portfolio against the portfolio on the basis of (14.27), in CUs, (the first and consecutive iterations)	Initial inputs for the property capital values, in CUs	Deviation of the revaluations against the initial capital value inputs, %
1	1412	1000	+41,2%
2	789	1300	-59,4%
3	1099	900	+22,0%
4	1487	1400	+6,2%
Portfolio composite of the 4 properties	**4787**	**4600**	**4%**

Comment: The green marker marks the properties for which the deviation is positive, the red marker highlights the opposite situation

as a result of the first revaluation the portfolio-level yield R changes from 9,24% to 8,88%).

The above effect is systematic and not explainable by rounding errors. Thus, it can be seen that TAPA by valuing separate properties against their portfolio aggregate as a benchmark allows to derive fundamental (equilibrium) values both for the subject assets and – at the portfolio level – for the reference portfolios made up of the subject assets. This application of TAPA also may have a potential for assessing a degree of over- or under-valuation for market niches (say, office, trading, industrial) within a particular geographic/national market for commercial property overall – like what is attempted in Crosby and Hughes (2011), but based on the TAPA principles. Further research in this area is still called for as to the economic properties of fundamental values thus obtained, except their stability, about the dependence of the effect on the implied level of the portfolio circularity, etc. Nonetheless, this application of TAPA also creates a potential for checking initial capital value- and income- growth inputs/forecasts ($u_s(i)$, $v_s(i)$) for mutual consistency (e.g., for properties within a selected portfolio benchmark, for different market niches within a particular geographical or national property market for commercial real estate), and for assessing the fundamental values of the related market yields. It should be emphasized, however, that no model of fundamental value based on TAPA is

complete without allowance for random shocks in the future, etc., and applying TAPA to exploring the issues of fundamental values remains a work in progress.

Accounting for Market Cyclicality and Exogenous Market Shocks in the TAPA's Framework: A Study of Mathcad Model for TAPA

As already adumbrated in the Example in section "An example of property valuation under TAPA's basic pricing equation", TAPA, by virtue of its time-variant discount rate mechanism, is a fruitful tool for studying the impact of market cycles on property values. Cycles are an inherent feature of property markets, and, apart from time-series analysis, their modelling relies on exogenous schemas, as well as an exploration of endogenous institutional and behavioral generation mechanisms associated with the availability of credit and procyclicality of economic measurements associated with the property market (see Barras (2009), Reed & Wu (2010), Grover & Grover (2013), Artemenkov (2020)). Cycles of various duration are identified within the context of property markets; some researchers even speculate that property markets are, to a various degree, affected by Kondratieff long-waves associated with the change in global technological paradigms and modes of production (Grover & Grover (2013)).

Whichever the generation model for the cycles, TAPA allows to smooth over variables and isolate general trends in the benchmark's projected performance and study the impact of such trends in isolation from recurring cyclical oscillations. A simple smoothing algorithm of such nature has been introduced for the TAPA framework in a Mathcad 13.0 discrete-time model for TAPA BPE[24]. To illustrate the capabilities of TAPA, this notional model generates subject property values depending on the assumed subject property holding period n ($n = 1, \ldots, N$) and has the following features (see Table 14.8).

Thus, in the example shown, smoothed market performance results in the decrease in subject property values (expectations for own performance of the subject property remaining unchanged). Depending on the frequencies and the amplitude of the generated cycles in $v(\tau)$ and $u(\tau)$, the effect can be more or less pronounced. But, quite naturally, some patterns of the expected market performance result in the presence of humps in the value curves $PV(n)$, $M_mPV(n)$, $WM_mPV(n)$, suggesting the presence of an optimum for the property holding period n. Readers are invited to experiment with introducing other dependencies (correlations and cyclicalities) into the Mathcad model for TAPA, especially introducing more refined randomized components into the $v(\tau)$ and $u(\tau)$ functions, correlating $v_o(\tau)$ and $u_o(\tau)$ with $v(\tau)$

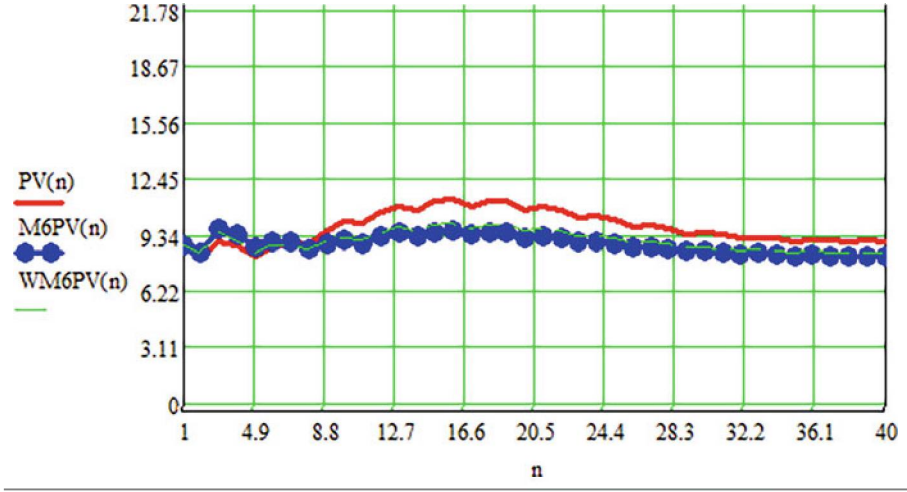
[24] Available at: https://drive.google.com/open?id=1i2m08WkCqjKO2EmonD9OXbbIbLUnqitf (Installing Mathcad 13.0 or later versions is required to use the file).

Table 14.8 Simulating cycles and random shocks for the application of the TAPA model in Mathcad

Cycle generation mechanism	Smoothing mechanism
Benchmark inputs (τ= 1 … n):	
$v(\tau) = (0.07 + 0.12\ \sin(0.1{\cdot}\tau) + 0.05\cos(4.1{\cdot}\tau) + \text{shv}(\tau)){\cdot}1$ where, shv(t)- is an exogenous random shock variable normally distributed as N (a, σ)	Simple moving averages with m-window $M_m(v(\tau)) = [v(\tau)+v(\tau-1)+\ldots v(\tau-m)]/m$ Weighted moving averages with m-window: $WM_m(v(\tau)) = [mv(\tau)+(m-1)\ v(\tau-1) + (m-2)\ v(\tau-2)\ \ldots\ 1{*}v(\tau-m)]/\sum m$
$u(\tau) = (0.02 + 0.1\ \sin(0.6{\cdot}\tau) + 0.1\cos(0.2{\cdot}\tau)){\cdot}1$	Same averaging principles applied with respect to u(τ) as for v(τ)
Subject property inputs:	
NOI(1)=1 CU	
$vo(\tau) = (0.07 + 0.1\ \sin(0.13{\cdot}\tau) + 0.09\cos(4.2{\cdot}\tau) + \text{shvo}(\tau)){\cdot}1$ where shvo(τ)- is a random shock variable normally distributed same as shv(τ) and correlated with the same at a set correlation rate r	Subject property dynamics for its capital value performance assumed as is without smoothing
$uo(\tau) = (0.01 + 0.16\ \sin(0.2{\cdot}\tau) + 0.05\cos(3.2{\cdot}\tau)){\cdot}1$	Subject property dynamics for its income assumed as is, without smoothing
An example of model impact (N = 40; m = 6, shv = 0, shvo = 0): Comparison of subject property values resulting from TAPA BPE (Eq. 14.19 run with (14.14)): $PV(n, M_m v(\tau), M_m u(\tau))$ vs $PV(n, v(\tau), u(\tau))$; $PV(n, WM_m v(\tau), WM_m u(\tau))$ vs $PV(n, v(\tau), u(\tau))$	

(continued)

Table 14.8 (continued)

Cycle generation mechanism	Smoothing mechanism
	

and $u(\tau)$, respectively, viewed as random variables using Cholesky transformations, introducing auto-correlations, etc.[25].

Concluding Remarks

As shown in this chapter, TAPA is an explicit model of comparative valuation under the income approach. The forefront notion of a benchmark is much more fine-tuned in TAPA compared to the traditional DCF and property income capitalization models within PV, where it is much more vague (although the discount rate derivation in those also has to allude to some notion of a benchmark, which is often inchoate and exists in the very background of valuation).

Additionally, TAPA is a multi-period dynamic model of asset values that proceeds from the initial assumption of the bargaining parity between the transacting agents (the TAPA principle of transactional equity). This assumption allows to generalize the DCF approach and the resulting income capitalization models, as well as recast the traditional DCF framework as a special case of the suggested more general TAPA framework.

Could it also be that TAPA opens up a substantive new perspective on the research into sustainable fundamental value of property?

To summarize, apart from various applications for valuing income-producing real assets, it appears that TAPA could offer the following promising applications:

(i) It suggests itself as a ready theory for equitable (IVS, 2020)/fair (EVS, 2016) value estimations, an area rather fraught with the theoretical vacuum, apart from Galasyuk (2018), including suggesting research prospects on the dependence of equitable/fair values on the holding period.
(ii) It is a fruitful engine for deriving new quite universal income capitalization formats – e.g., the "quick income capitalization model" as developed in Michaletz and Artemenkov (2018).
(iii) It can be tool for research and forecasting of rates of return/discount rates on the property and private equity markets – TAPA offers a theory of discount rates immediately useful for forecasting/running analytical surveys.
(iv) Proceeding from the very basic, yet under-explored, transactional perspective, TAPA also may have a surprising potential to impact research into the fundamental value of property with the new analytical perspective.

[25] Our Mathcad explorations of the v_o vs v, u_o vs u correlation issue suggest that in case v and u for the market benchmark are assumed to be normally distributed and v_o and u_o are derived for the subject property via Cholesky transformations with variable correlation coefficients ($r = 0...1$), the value of subject property PV shows no property of dependence on r.

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Chapter 15
Measures of Variability in the Application of Cyclical Capitalization (Normal Form) to London Office Market

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Abstract The introduction of the definition of cyclical assets in the International Valuation Standards (IVSC, 2017, 2020) requires a specific attention while valuing commercial properties with direct capitalization or discounted cash flow analysis. Following the introduction of cyclical capitalization model (d'Amato, Int J Strategic Property Manag 19(3):207–219, 2015) provides a possible solution for the problem of the integration of property market cycle inside the valuation process. In this vein the contribution explores the relationship between inputs and output in the cyclical yield capitalization modelling defining a relationship between variability of market trend and variability of the opinion of value. Evidence confirms the stability of the opinion of value provided by this kind of method.

Keywords Cyclical yield capitalization · Variability · Property market value

Introduction

A large body of literature on real estate cycles has been developed; more attention has been paid to the real estate market cycle and its consequences on the real estate market, especially after the global financial crisis in 2008. In the academic field, however, there is no agreement on a shared theoretical framework that analyzes the cyclical trend of the real estate markets; many efforts should be done in order to

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understand how cycle knowledge could be implemented in practice and subsequently in professional valuation practice. Furthermore, it has been found that property valuation process is sometimes not strictly interlinked with academic works focusing on the role of the market cycle at both micro and macro level. Macroeconomic analysis looks at the real estate cycles as part of a more complex business cycle that takes into account all the constructive activity and even the unemployment rates of the sector to justify the relationship between the cyclical nature of the real estate market and the interconnected markets. Alternatively, the microeconomic approach interprets the real estate market as subdivided into the space market, the investment market, the new construction market, and the land market. It pays attention to more circumscribed situations with regard to rent taxis and the availability of the market to absorb the asset. It is worth mentioning that the real estate market is driven by intrinsic and extrinsic forces. The former can be seen as market imperfection; they are produced by the law of supply and demand and are subject to it; the latter, however, do not strictly depend on the real estate market and those who work in that specific market but are influenced by the general economic trend and are responsible for the link between the economic cycle and the real estate market cycle and its local markets. The researchers' approaches to studying real estate cycles are different; the focus is on how to understand them and try to integrate the different phases. Phyrr et al. (1990) identify two branches of thought: the first diminishes the importance of the real estate market cycles defining them as irrelevant and thus neglecting them and the second is based on the assumption that cycles have strategic implications for investors because of their impact on the profitability of investments and related risks. Phyrr et al. (1990) emphasize the influence of market cycles when analyzing the real estate market; on the other hand, Roulac (1996), through a qualitative study on the role of these fundamental cyclical relationships, is in able to state that markets are subject to the effects of the economy in terms of office demand, office construction, properties' value, volume of transactions, capital for real estate, investors interests, and the climatic factors of taxation. According to Roulac et al. (1999), the cycle of the markets plays an important role for investments and portfolio management. In 1985 Heckman carried out a study on the analysis of market cycles for the period is 1979–1993 that allowed him to demonstrate the presence of cyclicity in the office sector. Analogously in 1988 a cyclicity was also found by Voith and Crone from the investigation of vacancy rates among the vacancies in the office market of 17 large metropolitan areas of the United States. Case and Shiller (1989), Borio et al. (1994), and Case et al. (1997) highlighted the cyclical nature of property prices, while Mueller and Laposa (1996) focused on rent distributions in different alternative market cycles. More specifically, they distinguish between the demand/supply cycle that determines rent rate levels and a more complex cycle in which prices also depend on capital flows. This study deepens these issues and aims to integrate this evaluation process with the real estate market cycle analysis using a group of income approach models defined as cyclical capitalization (d'Amato, 2015). In the first section, it is briefly discussed the income approach in the International Valuation Standards and cyclical capitalization; then, the second paragraph provides a concise application of the model to the office market

of two areas: South East London and South Bank London based on data provided by CBRE London. In this application it will be exposed how measures of variability may provide a form of control over the robustness of final result of valuation using these kinds of financial models. Robustness of valuation process is a very important concept. According to IVSC Technical Information Paper 4 on Valuation Uncertainty, there are three causes of uncertainty in the valuation process. The third one is the choice of the method of valuation. In fact it is stated that "...this arises from characteristics of either the valuation model or method used.... In certain valuation models the outcome may be disproportionately sensitive to small variations in the input data, for example due to gearing effects in the model..." (IVSC, TIP Valuation Uncertainty 4, para 12.4). The efficiency of a valuation model is normally related to the concepts of valuation variation and valuation accuracy (Crosby, 2000) comparing the opinion of value with the price (valuation accuracy) or with different opinion of value (valuation variation). In this case the control on the robustness of valuation is based on the quality of the input. In the application of such models, it is relevant the time series of the rent and price in the backward holding period in which both price and rent are observed to determine the temporal length of the property market phase and their variation ratio. The problem raised by this paper is how variability of previous rent influences the opinion of value. This is very important because of the differences between traditional discounted cash flow analysis whose attention is focused on the future growth of the specific assets. Final remarks will be offered at the end.

Income Capitalization and Cyclical Capitalization

Real estate appraisal based on income approach relies on the assumption that income that an asset will generate over its useful life and indicates its value through a capitalization process capitalization involves the conversion of an appropriate discount rate. The appraisal using the income approach is based on two reasonings: the first interprets the value of an asset with repeated utility as the sum of the income that it is able to provide; in other words, the asset is worth as much as it provides. In this case the income is transformed into capital value using a multiplier that derives from the property's lifetime. The second is a financial approach that allows the determination of the running value of the investment from a perpetual income to multiply for an appropriate capitalization rate. Direct capitalization directly converts property income into its estimated value by dividing the annual income for a capitalization rate, regardless of the financial considerations that refer to the duration of the investment. This paper will deepen this methodology. It is worth emphasizing that all the aforementioned procedures assume that the rents would be stable or constantly growing.

Operationally, the estimate by direct capitalization is expressed through the equality between the current market value of a property (V) and the sum of the net operating income (NOI) appropriately discounted to current through an appropriate

rate of return on the specific investment (capitalization ratio R). In this case we will use US terminology, but in previous papers, the model has been applied using Commonwealth terminology (d'Amato, 2010, 2015, 2017a, b; d'Amato et al., 2019a, b; Kauko & d'Amato, 2009). The NOI term depends on market conditions. If the annual rent to be capitalized is constant, deferred, and unlimited, the value of a property is determined as follows:

$$V = \frac{\text{NOI}}{R} \tag{15.1}$$

Whereas considering a variable annual rent increasing or decreasing according to a constant growth or degrowth rate of profit (g), the value of a property is inferred as follows:

$$V = \frac{\text{NOI}}{Y - g} \tag{15.2}$$

Again NOI represents net operating income, V is the value, and Y is the discount rate. The assumption for the application of the income capitalization model has to be that NOI ever grows or decreases at rate g. Formula (15.2) has been used, originally, by Gordon Shapiro (1956) and Gordon (1962) in two seminal scientific works, and it is known as dividend discount model. Its applicability was referred to stock whose dividend is always increasing or decreasing; only subsequently it has been adapted to the real estate valuation problems as follows:

$$V = \frac{\text{NOI}}{Y - \Delta a} \tag{15.3}$$

According to the *Appraisal of Real Estate* (13th Edition, p. 532), in the real estate appraisal, the term Δ represents "the total relative change in income and value"; therefore, in formula (15.3) the capitalization rate, or the discount rate, is the difference between Y and the term Δa. This latter term, actually, plays the same role as the growth rate in formula (15.2). Formally, it can be explained as follows:

$$\Delta a = \Delta \frac{Y}{(1+Y)^n - 1}$$

$$Y - g = Y - \Delta a = Y - \Delta\left(\frac{Y}{(1+Y)^n - 1}\right) \tag{15.4}$$

In the formula 15.4, the Δ term indicates a forecast of relative change in property income and value, n is the economic life of the property, and Y stands for discount rate. As mentioned above, the method seeks to integrate the theoretical evaluation process with the real estate market cycle analysis; therefore, the values required for the rate of change Δ a must be real and referred to the duration of the single phase of the market cycle (Appraisal Institute, 2013; d'Amato & Amoruso, 2018). In other

words, it represents the product produced between the rate of change in the specific phase of the market and the recapture rate calculated on the time length of the phase. The method makes it possible to take into account the medium change (Δ) both in the rent and in the value of the real estate market. When there is a lack of data, it is possible to rely on the medium rate of change in the single phase of the real estate market cycle. In this case, an annual rate of change of the net operating income can be calculated as in the following formula:

$$\Delta_t = \frac{\mathrm{NOI}_t - \mathrm{NOI}_{t-1}}{\mathrm{NOI}_{t-1}} \tag{15.5}$$

To correctly calculate the Δ in the (15.4), it is necessary to make the mean of all Δ_t; then this medium rate of change will be multiplied by the sinking fund factor a (or recapture rate) in order to transform the medium rate of change in an annual one. Unlike the direct capitalization (15.1) in which the net operating income is considered to be stable and the overall capitalization rate is unique and constant – including in this way the effects of the market cycles – in the traditional dividend discount model, product **Δa** is based on the product of the generic change in income and property value by the recapture rate (15.3). It is worth noting that, in both cases, taking overbuilt market valuations based on past information, assuming a stable ever-growing net operating income, may lead to overvaluation of the property (Kaklauskas et al., 2012, 2015; Constantino et al., 2009) especially dealing with a downturn of the market. At the same time, it is also true that during a recession, valuations can amplify the recession phase because the "stable" net operating income derives from the difficult phase of the market. Mueller and Laposa (1994) argue that there are two growth rates for the two different phases of the market cycle: the negative phase of *recession-recovery* and the second positive phase of *expansion-contraction*. The order of the two phases can be established by observing the trend of the real estate market: in any case the valuation of the property must take into account both rates; the opinion of the value, then, will be equivalent to the sum of different "intervals" with different growth factors or Δa rates of change. In particular the formula 15.5 will be applied to a *backward holding period* representing the last 10–15 years of income rents (d'Amato, 2015). In the *backward holding period*, the medium rate of change of the rent will be calculated of each phase. The medium rate of change will be multiplied for the sinking fund factor a as indicated in the formula 15.4, and both the growth factors in different market phases will be calculated. The complete cycle comprises the two phases; therefore, the real state value in the phase of recession-recovery whose length is t_{rr} results in:

$$V_{\mathrm{PhaseRR}} = \frac{\mathrm{NOI}}{Y - {}_{\Delta \mathrm{RR}} a_{\mathrm{RR}}} - \frac{\mathrm{NOI}}{Y - \Delta_{\mathrm{RR}} a_{\mathrm{RR}}} \frac{1}{(1+Y)^{\mathrm{trr}}} \tag{15.6}$$

The value of the property on the complete cycle will be obtained by adding the second phase of expansion-contraction:

$$V_{\text{PhaseRR+PhaseEC}} = \frac{\text{NOI}}{Y - \Delta_{\text{RR}} a_{\text{RR}}} - \frac{\text{NOI}}{Y - \Delta_{\text{RR}} a_{\text{RR}}} \frac{1}{(1+Y)^{\text{trr}}} + \frac{\text{NOI}}{Y - \Delta_{\text{EC}} a_{\text{EC}}} \frac{1}{(1+Y)^{\text{trr}}} + - \frac{\text{NOI}}{Y + \Delta_{\text{EC}} a_{\text{EC}}} \frac{1}{(1+Y)^{\text{tec+trr}}} \tag{15.7}$$

where t_{RR} represents the temporal length of recovery-recession and t_{EC} is the length of the expansion-contraction phase. If the temporal length of the two phases coincides so that $t_{\text{RR}} = t_{\text{EC}} = n$, the formula (15.7) will be rearranged as follows:

$$\begin{aligned} V = & \frac{\text{NOI}}{Y - \Delta_{\text{RR}} a_{\text{RR}}} \left(1 - \frac{1}{(1+Y)^{2n}} + \frac{1}{(1+Y)^{4n}} - \frac{1}{(1+Y)^{6n}} \cdots \right) \\ & - \frac{\text{NOI}}{Y - \Delta_{\text{RR}} a_{\text{RR}}} \left(\frac{1}{(1+Y)^{n}} + \frac{1}{(1+Y)^{3n}} - \frac{1}{(1+Y)^{5n}} \cdots \right) \\ & + \frac{\text{NOI}}{Y - \Delta_{\text{EC}} a_{\text{EC}}} \left(\frac{1}{(1+Y)^{n}} + \frac{1}{(1+Y)^{3n}} - \frac{1}{(1+Y)^{5n}} \cdots \right) \\ & - \frac{\text{NOI}}{Y - \Delta_{\text{EC}} a_{\text{EC}}} \left(\frac{1}{(1+Y)^{2n}} + \frac{1}{(1+Y)^{4n}} - \frac{1}{(1+Y)^{6n}} \cdots \right) \end{aligned} \tag{15.8}$$

In formula (15.7) it is possible to recognize four *infinitive* geometric progressions of rate "$-1/(1+Y)^n$." Assuming the addition rate of an infinite geometric progression included in the $-1 < r < 1$ interval, the progression will tend to the formula (15.9):

$$\sum_{i=1}^{\infty} r_i = \frac{1}{1-r} \quad \text{where } r = -\frac{1}{(1+Y)^{\text{n}}} \tag{15.9}$$

And the value of the perpetuity will be:

$$V = \frac{\text{NOI}(1+Y)^n}{(1+Y)^n + 1} \left[\frac{1}{Y - \Delta a_{\text{RR}}} + \frac{1}{Y - \Delta a_{\text{EC}}} \frac{1}{(1+Y)^n} \right] \tag{15.10}$$

In the previous formula, different growth factors are easily distinguishable according to the real estate market phases. They are represented by the Δa terms: in particular, the Δa_{RR} term refers to the recovery-recession phase, while the Δa_{EC} is for the expansion-contraction phase. This type of approach is particularly suitable in the case of assessment of income-producing properties in contexts characterized by a strong upturn and downturn of the market cycle (Renigier et al., 2017, 2018, 2019). This is the case of the office and commercial market segments, and the terminology used in this context is based on US tradition.

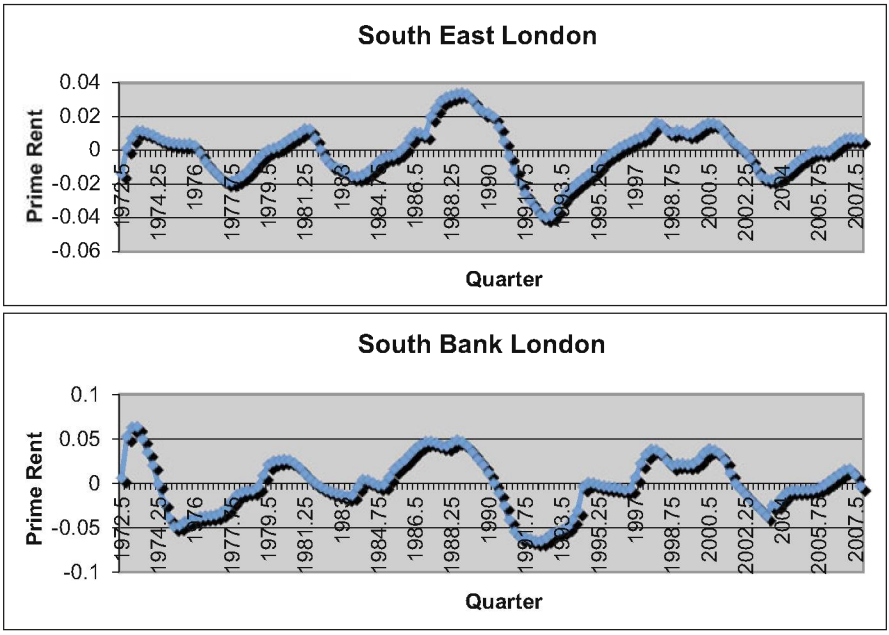


Fig. 15.1 Prime rent time series

Variability Measures and Cyclical Capitalization Application

In this section the cyclical capitalization method will be applied to two different market segments of London office market: of the South Bank and South East in London using a historical series of prime orders in the office sector. The data were provided by CB Richard Ellis London and are particular interesting because they date back more than 20 years before the 2008 crisis. In fact, they are split into time series starting from the 3rd quarter of 1973 ending at 1° 2008. The data are referred to the prime rent.[1] In order to observe the market cycle, we will focus on a well-defined time interval known as backward holding period (d'Amato, 2003). This is to distinguish it from the holding period used in the analysis of discount cash flow. Applying variability measure to each property market phase will introduce the first methodological criteria to assess the robustness of the valuation. As one can see, this is an *endogenous methodological way* to assess the robustness of the market condition in which the valuation is delivered. A criterion that may integrate into the traditional and well-known valuation accuracy (Crosby, 2000). In Fig. 15.1 it is possible to observe the evolution of prime rent along the backward holding period in both the areas.

[1] Authors are grateful to CBRE London for providing the data.

Table 15.1 Different market phases South East London (CBRE data elaboration of the authors)

Area SEL rate of change divided per three different market phases					
First phase EC		Second phase RR		Third phase EC	
Quarter	Rate of change	Quarter	Rate of change	Quarter	Rate of change
1998:2	0	2002:1	0,002797	2005:2	−0,001796
1998:3	−0,01382	2002:2	−0,001556	2005:3	0,0004315
1998:4	0,001012	2002:3	−0,006503	2005:4	0,0014
1999:1	0,007286	2002:4	−0,0101	2006:1	0,00242
1999:2	0,01142	2003:1	−0,01318	2006:2	0,004561
1999:3	0,01143	2003:2	−0,01638	2006:3	0,00688
1999:4	0,01024	2003:3	−0,01842	2006:4	0,0087
2000:1	0,009162	2003:4	−0,01829	2007:1	0,01043
2000:2	0,007398	2004:1	−0,01692	2007:2	0,01264
2000:3	0,00576	2004:2	−0,01494	2007:3	0,01242
2000:4	0,004847	2004:3	−0,01221	2007:4	0,007108
2001:1	0,004329	2004:4	−0,008587	2008:1	0,0004783
2001:2	0,003936	2005:1	−0,004897		
2001:3	0,003731				
2001:4	0,003985				

In Fig. 15.1 it is possible to observe both the cyclical components of these time series elaborated with GRETL.[2] The reference period lasts 15 years. The time series analysis showed a Durbin-Watson test of 2.0234 in the former series and 2.0345 in the latter case, while the former has a Dickey-Fuller test of −0.5614 and the latter a −0.6123. According to Fig. 15.1, it is possible to see three relevant property market phases in the office market of South East London. They are described in Table 15.1.

In a similar way, Table 15.2 describes the rate of change per three different market phases in South Bank London.

Starting from the data observed, it is possible to use several measures of variability to analyse the variability of the value along each phase of the time series. In Table 15.3 it is possible to observe several distinct measures of variability of values along each property market phase.

In Table 15.3 the first column highlights several different measures of variability, while the second column shows these measures for the first expansion-contraction phase of the market. Measures of variability include standard deviation in the second row, range in the third and fourth rows, and definition of intervals using t-student distribution from 5th to 9th rows. The coefficient of variation as a relative measure of variability in the 10th row completes the analysis; in the 11th row, there is the transformation of quarterly mean in annual mean. A comparison can be done with the same analysis provided for the second area considered: South Bank London. This will be shown in Table 15.4.

[2] http://gretl.sourceforge.net

Table 15.2 Different market phases South Bank London (CBRE data elaboration of the authors)

Area SBL rate of change divided per three different market phases					
First phase EC		Second phase RR		Third phase EC	
Quarter	Rate of change	Quarter	Rate of change	Quarter	Rate of change
1997:3	0,03237	2001:4	−0,0005591	2006:1	0,001957
1998	0,03775	2002	−0,006631	2006:2	0,00647
1998:1	0,03711	2002:1	−0,01318	2006:3	0,01039
1998:2	0,03309	2002:2	−0,01936	2007	0,01476
1998:3	0,02528	2002:3	−0,0249	2007:1	0,01576
1999	0,01987	2003	−0,03135	2007:2	0,009218
1999:1	0,0215	2003:1	−0,03732	2007:3	−0,003416
1999:2	0,02171	2003:2	−0,02535		
1999:3	0,02072	2003:3	−0,02366		
2000	0,0219	2004	−0,01611		
2000:1	0,02612	2004:1	−0,009457		
2000:2	0,03358	2004:2	−0,007924		
2000:3	0,03817	2004:3	−0,007995		
2001	0,03678	2005	−0,00773		
2001:1	0,033	2005:1	−0,007657		
2001:2	0,02523	2005:2	−0,00704		
2001:3	0,01118	2005:3	−0,005017		
		2006	−0,002264		

Table 15.3 Different measures of variability in the market phases South East London (CBRE data elaboration of the authors)

Mean (quarterly)	0,0047144		−0,010706615		0,005472733
Stand. Dev (quaterly) s	0,006193397		0,006686186		0,004947074
Minimum	−0,01382		−0,01842		−0,001796
Maximum	0,01143		0,002797		0,01264
n	15		13		12
$t_{(\alpha/2;15-1)}$	2,14	$t_{(\alpha/2;13-1)}$	2,18	$t_{(\alpha/2;15-1)}$	2,14
Minimum	0,001172154		−0,014914311		0,002280712
Maximum	0,008256646		−0,00649892		0,008664755
Delta	0,007084491		0,008415391		0,006384043
Coefficient of Variation	1,313719007		0,624491077		0,90394938
Mean (annual)	0,018991373		−0,042143568		0,022071295

A comparison between Tables 15.3 and 15.4 may provide further information related to the cycle that is modelled with a cyclical capitalization model. It seems evident a higher variability in South East London compared to South Bank London. Therefore, the application in South East London may have a lower rate of valuation accuracy. These measures of variability together with the output of time series

Table 15.4 Different measures of variability in the market phases South Bank London (CBRE data elaboration of the authors)

Mean (quarterly)	0,027962353		−0,014083561		0,007877
Stand. Dev (quaterly)	0,006994004		0,010854514		0,006857948
Minimum	0,01118		−0,03732		−0,003416
Maximum	0,03817		−0,0005591		0,01576
n	17		18		7
$t_{(\alpha/2;17-1)}$	2,12	$t_{(\alpha/2;18-1)}$	2,11	$t_{(\alpha2;7-1)}$	2,45
Minimum	0,024255531		−0,019638361		0,001017623
Maximum	0,031669175		−0,008528762		0,014736377
Delta	0,007413644		0,011109599		0,013718754
Coefficient of Variation	0,250122164		0,770722261		0,87062946
Mean (annual)	0,147852406		−0,068462077		0,040010378

Table 15.5 Temporal length of market phases South Bank London and South East London (CBRE data elaboration of the authors)

Phases SEL office market				
Ist phase	IInd phase	IIIrd phase	Arithmetic mean	t
EC	RR	EC		
15	13	12	13,3	4
Phases SBL office market				
Ist phase	IInd phase	IIIrd phase		t
EC	RR	EC		
16	16	17		5

analysis may be helpful in defining the reliability of the valuation process. In this case the valuation provided in South Bank London may be more reliable. Further analysis may be helpful in defining the relationship between measure of variability in the property market phase and valuation accuracy and valuation variation. They may be useful to comprehend how variability of prime rent in the single market phase may affect the valuation process. At this stage these measures of variability may be considered a useful further analysis. In order to apply the model, it is necessary to fix a temporal length of the property market phase. In Table 15.5, there is an estimation of temporal length of all the phases per each London considered in this paper.

The temporal length of each phase assumed equal according to the formula 15.7, it is possible to calculate the Δa term using Inwood premise. This is clear in Table 15.6 for the London South East area.

In particular, in the first column, there is the number of simulation; in the second column is the discount rate varying from 0.04 to 0.19; and in the third column, there is the rate of change calculated assuming the evidence indicated in Table 15.5. In the fourth column, there is the sinking factor calculated on the same discount rate according to Inwood premise. The product Δa will be done per phase (expansion-contraction and recovery-recession) in the fifth and seventh columns. Finally we

Table 15.6 Calculation of overall cap rates in South East London (CBRE data elaboration of the authors)

	OFFICE MARKET AREA SEL CALCULATION OF R_{RR} and R_{EC}						
	Y	Rate of change Δ RR	Sinking fund factor	Δa_{RR}	R_{RR}	Δa_{EC}	R_{EC}
1	0,04	−0,042143568	0,235490045	−0,009924	*0,049924*	0,004835	*0,035165*
2	0,05	Rate of Change Δ EC	0,232011833	−0,009778	*0,059778*	0,004764	*0,045236*
3	0,06	0,020531334	0,228591492	−0,009634	*0,069634*	0,004693	*0,055307*
4	0,07	t (years)	0,225228117	−0,009492	*0,079492*	0,004624	*0,065376*
5	0,08	4	0,221920804	−0,009353	*0,089353*	0,004556	*0,075444*
6	0,09		0,218668662	−0,009215	*0,099215*	0,00449	*0,08551*
7	0,1		0,215470804	−0,009081	*0,109081*	0,004424	*0,095576*
8	0,11		0,212326352	−0,008948	*0,118948*	0,004359	*0,105641*
9	0,12		0,209234436	−0,008818	*0,128818*	0,004296	*0,115704*
10	0,13		0,206194197	−0,00869	*0,13869*	0,004233	*0,125767*
11	0,14		0,203204783	−0,008564	*0,148564*	0,004172	*0,135828*
12	0,15		0,200265352	−0,00844	*0,15844*	0,004112	*0,145888*
13	0,16		0,197375069	−0,008318	*0,168318*	0,004052	*0,155948*
14	0,17		0,194533114	−0,008198	*0,178198*	0,003994	*0,166006*
15	0,18		0,191738671	−0,008081	*0,188081*	0,003937	*0,176063*
16	0,19		0,188990938	−0,007965	*0,197965*	0,00388	*0,18612*

have the determination of the two distinct overall capitalization rates for both the phases. In Table 15.7 the same application for the area South Bank London.

After the determination of the two overall capitalization rates, it will be possible to define the value using cyclical capitalization in the form of formula 15.10 (normal form): A comparison between the cyclical capitalization and the direct capitalization based on the cap rate of each phase is indicated in Table 15.8 for the South East London area.

In the same way, it is possible to observe the value determination using cyclical capitalization and direct capitalization per market phase for South Bank London area in Table 15.9.

Both in Tables 15.8 and 15.9 is possible to observe a comparison between the value determined by cyclical capitalization and the value deriving from the direct capitalization per property market phase which offers an interesting result. As one can see, the cyclical capitalization determines values always included in the interval between the direct capitalization based on the recovery-recession capitalization rates and the same capitalization based on the expansion-contraction phase. Therefore, cyclical capitalization provides results less sensitive to the property market cycle dynamics; the value has the nature to be truly a long-term value without strong sensitivity to property market value. This is coherent with previous analysis and may be a closer interpretation of the definition of mortgage lending value according to European Valuation standards as a "...value of immovable property as determined by a prudent assessment of the future marketability of the property taking into

Table 15.7 Calculation of overall cap rates in South Bank London (CBRE Data Elaboration of the Authors)

OFFICE MARKET AREA SBL CALCULATION OF R_{RR} and R_{EC}							
	Y	Rate of change Δ	Sinking fund factor a	Δa	*Rrr*	Δa	*Rec*
1	0,04	−0,068462077	0,184627113	−0,01264	*0,05264*	0,013931	*0,136069*
2	0,05	Rate of Change Δ EC	0,180974798	−0,01239	*0,06239*	0,01407	*0,13093*
3	0,06	0,093931392	0,1773964	−0,01214	*0,072145*	0,01421	*0,12579*
4	0,07	t (years)	0,173890694	−0,0119	*0,081905*	0,014352	*0,120648*
5	0,08	5	0,170456455	−0,01167	*0,09167*	0,014495	*0,115505*
6	0,09		0,167092457	−0,01144	*0,101439*	0,01464	*0,11036*
7	0,1		0,163797481	−0,01121	*0,111214*	0,014786	*0,105214*
8	0,11		0,16057031	−0,01099	*0,120993*	0,014933	*0,100067*
9	0,12		0,157409732	−0,01078	*0,130777*	0,015083	*0,094917*
10	0,13		0,154314543	−0,01056	*0,140565*	0,015233	*0,089767*
11	0,14		0,151283546	−0,01036	*0,150357*	0,015386	*0,084614*
12	0,15		0,148315552	−0,01015	*0,160154*	0,01554	*0,07946*
13	0,16		0,145409382	−0,00996	*0,169955*	0,015695	*0,074305*
14	0,17		0,142563864	−0,00976	*0,17976*	0,015852	*0,069148*
15	0,18		0,139777842	−0,00957	*0,189569*	0,016011	*0,063989*
16	0,19		0,137050167	−0,00938	*0,199383*	0,016172	*0,058828*

Table 15.8 Value determined using cyclical capitalization and direct capitalization per each market phase for South East London (CBRE data elaboration of the authors)

AREA SEL VALUE DETERMINATION						
	Y	Rrr	Rec	V_{CC}	V_{RR}	V_{EC}
1	0.04	0.049924390	0.035165075	*23.904743*	20.030289	28.437305
2	0.05	0.059777806	0.04523648	*19.155796*	16.728616	22.106048
3	0.06	0.069633661	0.055306711	*16.005138*	14.360870	18.08098
4	0.07	0.079491916	0.065375766	*13.755374*	12.579895	15.296187
5	0.08	0.089352534	0.075443669	*12.065722*	11.191624	13.25492
6	0.09	0.099215477	0.085510440	*10.748925*	10.079072	11.69447
1	0.1	0.10908070	0.095576096	*9.6932100*	9.1675238	10.462867
2	0.11	0.11894819	0.10564065	*8.8275939*	8.4070215	9.4660524
3	0.12	0.12881788	0.11570413	*8.1047776*	7.7628971	8.6427332
4	0.13	0.13868975	0.12576655	*7.4919986*	7.2103377	7.9512393
5	0.14	0.14856377	0.13582793	*6.9658311*	6.7311159	7.362255
6	0.15	0.15843989	0.14588828	*6.5090742*	6.3115416	6.8545599
7	0.16	0.16831808	0.15594762	*6.1088082*	5.9411320	6.4124092
8	0.17	0.17819831	0.16600597	*5.7551387*	5.6117251	6.0238795
9	0.18	0.18808055	0.17606334	*5.4403585*	5.3168708	5.6797738
10	0.19	0.19796475	0.18611976	*5.1583739*	5.0514042	5.3728845

Table 15.9 Value determined using cyclical capitalization and direct capitalization per each market phase for South Bank London (CBRE data elaboration of the authors)

AREA SBL VALUE DETERMINATION						
	Y	Rrr	Rec	V_{CC}	V_{RR}	V_{EC}
1	0.04	0.052639955	0.1360685	30.337540	18.996976	44.135070
2	0.05	0.062389910	0.1309298	22.299019	16.02823	30.302309
3	0.06	0.072144925	0.1257897	17.80159	13.860988	23.075018
4	0.07	0.08190491	0.1206481	14.883278	12.209279	18.633700
5	0.08	0.091669802	0.1155050	12.819772	10.908717	15.627737
6	0.09	0.10143949	0.1103604	11.276181	9.8580930	13.4580
1	0.1	0.11121391	0.1052142	10.074479	8.9916805	11.818336
2	0.11	0.12099297	0.1000666	9.1105602	8.264942	10.535475
3	0.12	0.13077659	0.0949174	8.319167	7.6466280	9.5044128
4	0.13	0.14056469	0.08976662	7.657171	7.1141619	8.6576323
5	0.14	0.15035718	0.08461427	7.0948504	6.6508294	7.9497748
6	0.15	0.16015399	0.07946032	6.6110171	6.2439905	7.3492387
7	0.16	0.16995502	0.07430477	6.1901410	5.8839094	6.8333318
8	0.17	0.179760218	0.06914759	5.820565	5.562966	6.3853381
9	0.18	0.189569	0.06398878	5.4933631	5.2751107	5.9926719
10	0.19	0.199382739	0.05882832	5.2015783	5.0154792	5.645676

account long-term sustainable aspects of the property, the normal and local market conditions, the current use and alternative appropriate uses of the property" (EVS 2 Valuation Basis Other than Market Value, para 7.1). The long-term perspective is evident from being less sensitive to upturn and downturn of market cycle, even if the property market cycle is included and not neglected in the appraisal process. Another important observation concerns the measures of variability. Higher variability measure does not imply meaningful difference between the valuation through the cyclical capitalization and the direct capitalization mainly based on the cap rate of the specific market phase (Baum and Crosby, 2014). This may be caused by the short length of the cycle 4 in one case and 5 in the other case. A further reason is that there is a lag between change in the property market cycle and contractual term that is normally adequate in legal terms having a delay on property market dynamic. Another reason may be anchoring of valuation. In other terms "Valuation lagged further and further behind prices, indicating that they followed upwards at a lower gradient than the rate at which proces were raising: However they also appeared to follow prices down at a lower rate than they were actually falling" (Baum & Crosby, 2014 p. 16). Further works are required to verify the role of the meaures of variability for longer cycle in different contexts.

Final Remarks and Future Directions of Research

This work aims part of a research on the cyclical capitalization meant as a method to evaluate income-producing properties. The convenience of the method consists in being able to take into account the real estate market cycle according to the opinion of value formulation. The model is part of a larger group of valuation methodologies using the income approach. In this paper we indicated the variability of prime rent in each phase as a measure of reliability of the results of cyclical capitalization. It is possible to observe that in this case variability of prime rent does not affect valuation variation. In fact although we observe a higher variability in the prime rent in South East London, in the same context, we observed a lower valuation variation. The above findings, coming from the analysis of a particular area of the market, should be extended to the comparison to different types of properties generating income and also to different real estate markets. A further generalization could be the application of other cyclical capitalization models and the identification of the possible countercyclical role of this family of valuation methods in the real estate market.

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Chapter 16
Housing Valuation and the Business Cycle: The Hedonic House Price Index Approach



Shanaka Herath and Gunther Maier

Abstract The hedonic price method (Rosen S. J Polit Econ 82:34–55, 1974) has widely been used to assess the demand for, and prices of, housing. This method is founded on the notion that housing is a composite commodity with inherent *properties* and the value of a house can be estimated by aggregating the assessed values of its separate properties. The properties are not limited to structural differences of houses, but also include locational and neighbourhood characteristics. Scholarly literature suggests house prices are also influenced by the time trend and the business cycle; therefore, time-related (temporal) determinants need to be included in the hedonic model if prices are to be evaluated over time. This chapter examines various strategies that have been implemented within hedonic price method to incorporate the impact of the business cycle. It begins by considering the most common cross-sectional hedonic models, where business cycle effects are largely ignored due to their focus on 'one point in time' (e.g. Herath S, Choumert J, Maier G. Ann Reg Sci 54:349–374, 2015). Other functional forms including hedonic panel models, spatial panel models and spatiotemporal models are then reviewed. These models take into account temporal changes including the business cycle effects in a comprehensive way (e.g. Hiller N, Lerbs OW. Reg Sci Urban Econ 60:276–291, 2016). One version of the fixed effects panel model generates time fixed effect coefficients that could be interpreted as a real estate price index – also representing business cycle effects. We also demonstrate an alternative functional form that is capable of representing the time trend and cyclical variation of house prices within the hedonic framework (Herath S. Discovering the urban structure using a spatial Hedonic house price model. In: Wang Y, Shen KLGQP, Bai Y, Xue X, Sun C, Gao Z, Wu Y, Xue W (ed) ICCREM 2013 – Construction and operation in the context of sustainability. American Society of Civil Engineers, 2013). Despite the common challenge of

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disentangling the business cycle and time trend, the incorporation of the business cycle is an important consideration as any assessment of house prices over time without taking into account temporal dimensions leads to biased estimates.

Keywords Hedonic method · Business cycle · House price · Housing valuation

Introduction

The housing stock is an integral part of any national economy; therefore, changes in housing values may have consequences for almost every sector of the economy. Declining housing demand results in decreasing prices and negatively affects a number of other sectors in the economy including financial and construction sectors. Governments are also concerned about declining house prices due to potential lower tax incomes generated through asset holdings (e.g. land tax and rates). Poorly performing housing markets further mean the values of homes held by individual households decline regardless of whether they are actively being sold in the market or not. Thus falling house prices also have a negative impact on consumer spending and limit the availability of finance – i.e. restrict access to home equity loans for potential homeowners.

The interdependence of house prices and the macroeconomy was particularly apparent after the global financial crisis (GFC) when a number of countries observed their housing markets crash dramatically. Economies run in large part on confidence (Ellis, 2009): spending is lower when firms and consumers have no confidence in the economy; and lending is lower when banks and other financial institutions are not confident about the performance of the economy. New economic risks make otherwise profitable housing projects less attractive. Poor lending practices and bank regulations compound these issues, and international trade flows between countries translate this into a global problem. At the broader economy level, these macroeconomic shocks associated with spending, lending, economic risks, regulations, commodity prices and economic activities influence housing demand and prices.

Any effort to examine the impact of these economic factors on house prices is complex. This is because house prices are also influenced by a number of property-specific factors as well as locational and neighbourhood attributes. Albeit this complexity, the economic and financial environment within which housing is purchased and consumed should be considered in studies examining house prices over time. This enables capturing how the changing economic and financial environments impact upon housing demand and prices. Generally, the economic and financial environment is represented using macroeconomic variables that incorporate the effects of both the 'trend' and the 'business cycle' of the economy.

In the scholarly literature, hedonic price method (HPM) is a standard approach used to assess how house prices are determined. The appropriate version of the hedonic model is usually governed by the aspect of house price being studied. For instance, studies may focus on overtime prediction of house prices using time series methods; spatial variation of house prices using cross-sectional models; or both

spatial and temporal changes using spatial panel or spatiotemporal models. Time series, panel, spatial panel and spatiotemporal models consider time-related variations and therefore incorporate business cycle effects into the analyses. In parallel with these scholarly developments, advancements in technology and availability of new data have enabled professional valuers to develop effective strategies to incorporate business cycle effects into their valuations.

This chapter examines housing valuation in the presence of business cycles using hedonic price method. It particularly focuses on how the scholarly approaches, specifically hedonic price method, and professional valuation methods have progressively incorporated business cycle effects into their valuations. The taxonomic approach allows us to develop a comprehensive understanding of the origin, context and relevance of each of the key approaches used within the broader hedonic literature. As it turns out, recent advancements in the valuation methods, including automated valuation models (AVMs), have closely followed the evolution of hedonic models. We also demonstrate business cycle effects using a simple hedonic application.

The incorporation of business cycle effects into time series, panel, spatial panel and spatiotemporal models is beneficial as these models may otherwise produce biased estimates. Similarly, housing valuations that consider comparable properties from different periods without adjusting the values for business cycle effects may as well result in inaccurate valuations. The chapter thus addresses an important gap in the literature by providing a wide-ranging review of hedonic models incorporating business cycle effects and establishing the strong link between these models and the new valuation methods.

The chapter is organised as follows. The sections "Business cycle effects of house prices: The scholarly view" and "Business cycle effects of house prices: The practitioner's view" discuss the business cycle effects of house prices from scholarly and practitioner's points of view, respectively. Hedonic price method and the wide-ranging hedonic specifications relevant for modelling business cycle effects are reviewed in section "Modelling business cycle effects using hedonic price method". The sections "Business cycle effects of house prices: The practitioner's view" and "Modelling business cycle effects using hedonic price method" also deliberate on how AVM and HPM evolved over time to enable assessment of house prices from different perspectives: spatial, temporal and longitudinal. The section "An application of a Simple Hedonic Model (Herath, 2013)" illustrates an application of a simple panel model to capture business cycle effects of house prices. The section "Conclusion" closes with a summary of key points.

Business Cycle Effects of House Prices: The Scholarly View

In this section, we look at the business cycle effects of house prices from a scholarly point of view, focusing on key temporal housing demand and supply determinants that are theoretically relevant and empirically validated.

House prices are sensitive to time-related (also termed *temporal*) changes in the economy. Studies on temporal changes of house prices focus on the co-movement of macroeconomic variables and house prices. The common feature of these studies is that they explain house price movements considering the economic and financial environment – i.e. economic conditions, regulatory factors, monetary policies, market conditions and market structures. Table 16.1 broadly classifies scholarly research on this topic into sub-themes (in **bold text**), generating a robust list of potential time-related housing demand variables.

In effect, temporal changes of house prices captured using the above variables reflect the temporal trend, business cycle effect or both. However, many of these studies fall short of separating the time trend effects from the business cycle effects. There are few exceptions. For instance, Poterba (1991) and Abraham and Hendershott (1992) employ variables such as real income, real construction costs and real interest rate to specifically examine the relationship between house prices and the persistent *trend* of the economy.

Amongst those studies focusing explicitly on the business cycle effects, Clayton (1996) and Abraham and Hendershott (1996) investigate the relationship between business cycles in the economy and house prices and provide evidence that business cycle effects generate real estate price cycles. These business cycle effects may result from short-term shocks to the economy through a decline in the productive capacity of the economy (i.e. unemployment or lack of investment). For example, Englund and Ioannides (1997) examine the co-movement of temporal shocks of the economy and house prices. The business cycle effects may also derive from a lack of confidence in the economy, leading to a decline in consumer spending, including spending on housing. For instance, Muellbauer and Murphy (1997) suggest formation of expectations generates house price cycles.

Table 16.1 and the above discussion justify introducing time-related variables as determinants of house prices within house price analyses. The inclusion of the temporal dimension allows capturing persistent trend, volatile prices and cyclical behaviour of house prices.

Business Cycle Effects of House Prices: The Practitioner's View

From a valuer's perspective, the factors that are taken into account in appraising the value of a property can be classified into two groupings: property-specific characteristics and time-related determinants. The *former* includes characteristics such as size of the property (including land), number and type of rooms, building structure and condition (including any faults), fixtures and fittings (including the standard of presentation), ease of vehicle access and a garage, location, local council zoning and planning restrictions. A professional valuer appraises which comparable properties

Table 16.1 Temporal determinants of house prices

Determinant	Variable	Indicators/data	Reference	Effect on house price
Economic conditions	Aggregate macroeconomic changes	Gross domestic product, unemployment rate	Oestmann and Bennöhr (2015)	Favourable economic conditions such as employment growth, wage growth and higher consumer spending (including on housing) increase housing prices
		Equity prices and stock market performance	Mikhed and Zemcik (2009)	
	Income, wealth and 'propensity to consume' variables	Income per head and wealth-income ratio	Pain and Westaway (1997)	
		Debt-to-income ratio	Jeong et al. (2017)	
	General inflation	Consumer price index	Oestmann and Bennöhr (2015)	
		Housing supply-related costs, e.g. construction costs	Adams and Füss (2010)	
Regulatory factors	Deregulation of financial markets	Removal of ceilings on interest rates, the lifting of credit controls	Agnello and Schuknecht (2011)	Deregulation amplifies the occurrence of boom episodes
	Tighter lending controls	Ratio of borrowing by investors to total lending for residential property, introduction and existence of tighter APRA[a] controls for investor lending	KPMG (2017)	Tighter lending controls push down house prices
		Lending conditions	Nobili and Zollino (2017)	
		Domestic credit availability (specifically, housing finance credit availability)	Cerutti et al. (2017)	
Monetary policies	Interest rate	10-year government bond rate	Adams and Füss (2010)	Increase in long-term interest rate results in a decline in house prices
	Central bank total assets and the monetary base	Central bank total assets	Rahal (2016)	Monetary policy shock, in the form of an increase of central bank total assets, is likely to increase house prices with a time lag

(continued)

Table 16.1 (continued)

Determinant	Variable	Indicators/data	Reference	Effect on house price
	Monetary-easing shocks	Capital inflow shocks, credit shocks, sentiment shocks, reverse of the interest rate shocks, non-fundamental house price runup	Zhu et al. (2017)	A monetary-easing shock triggers house price booms
Market structure and conditions	Mortgage market structure	The average value of five indicators: mortgage rate type, availability of mortgage equity withdrawal, maximum loan-to-value ratio, degree of mortgage securitisation and government participation index	Zhu et al. (2017)	High degrees of government participation make house prices more vulnerable to the external shocks (and result in lower house prices)
		Mortgage loans as a share of GDP	Sunde and Muzindutsi (2017)	Positive link between mortgage loans as a share of GDP and house prices
	Foreign direct investments and investments on real estate development	Sum of annual real estate development investments and foreign direct investments	Rahman et al. (2012)	The sum of foreign direct investments and investments on real estate development has a positive effect on house prices
	Housing stock	Percentage change in houses	Abelson et al. (2005)	An increase in housing stock depresses house prices
	Home ownership	The user cost of home ownership	Jeong et al. (2017)	An increase in the user cost of house ownership leads to decreases in real house prices
	Land supply	The total area of land whose leaseholds were sold to developers by the city government (i.e. new increase in the urban land stock), the total built-up land area (i.e. land area with completed construction)	Wang and Zhang (2014)	Changes in land supply account for a major proportion of housing price appreciation
	Foreign buyers' housing demand	Number of foreign buyers	Tai et al. (2017)	Price-elastic foreign housing demand results in a fall in the short-run house prices

[a]Notes: The Australian Prudential Regulation Authority (APRA) is an independent statutory authority that supervises financial institutions and promotes financial system stability in Australia

have been sold, or are for sale, and for what value, bearing in mind the distance from the subject property to the 'comparables'.

The *latter*, time-related determinants, captures the prevailing market conditions, adjusting for how far back in time the comparables were sold. Therefore, professional valuers recognise the significance of market conditions and business cycles when valuing a property. In the first instance, to control for the impact of these time-related factors on their valuations, they only consider the values of recently sold properties that are in close proximity to a subject property. However, if a sufficient number of such properties are not available, they consider property values from different time periods, and the valuers then adjust their valuations for temporal determinants such as business cycles. These adjustments are often made based on 'gut feelings' of the valuer rather than any formal assessments.

The early integration of market cycles in property valuation occurred within the hedonic approach. The developments in the valuation practice since then also reflect the historical expansion of the hedonic model. For example, the recent automated valuation models (AVMs) are built on advanced hedonic models that incorporate time-related dynamics including the business cycle effects. This demonstrates the way in which hedonic models have impacted upon the present-day valuation practices.

AVMs have gained wide popularity amongst valuers and commercial valuation firms. They are software that analyse and compare large-scale transaction datasets to apply a value to a property. Whilst AVMs apply the same thinking as in manual valuations, there are significant differences as to how they are implemented and used:

- Behind the AVMs are a suit of statistical models that are estimated with large-scale datasets.
- Latest AVMs self-learn by using artificial intelligence (AI) techniques to weight different factors and have become more accurate through machine learning.
- AVMs are currently more popular within residential markets, mainly because this sector is more liquid and transparent than commercial property markets and has larger transaction volumes that help generate more accurate estimates.
- AVMs produce auxiliary information on the model accuracies known as forecast standard deviations. These indicate the reliability of the valuations.

Perceived as a faster and cost-effective solution, AVMs are used by financial institutions predominantly in the homogeneous end of the market to support lending decisions, replacing full valuation reports provided by professional valuers. AVMs are particularly widely used in the USA, Canada, Australia and several European countries including the UK and have an emerging use in other countries. For instance, in Australia, a number of commercial property information firms including Australian Property Monitors (APM) and CoreLogic (RPData) have developed their own AVMs.

Due to the increasing uptake of AVMs, there is a renewed interest in standardising the methods applied within these models. An important consideration within this discourse has been on the role of business cycles in the formation of house prices, and there is a wide recognition amongst valuers that AVMs should take into account business cycle effects. This has been well-articulated in a recent publication (*International Association of Assessing Officers*, 2018):

Time series analyses are techniques that can be used to measure the cyclical movements, random variations, seasonal variations and cyclical trends observed over time. In property valuation, these analyses can be used to develop a multiplier or index factor to update existing appraised values or to adjust sale prices for individual properties to a valuation date. Since values can change at different rates in different markets, separate factors should be tested for each property type and market area (p. 11).

Modelling Business Cycle Effects Using Hedonic Price Method

As discussed in section "Business cycle effects of house prices: The scholarly view", the topic of temporal changes of house prices is a subject of much recent scholarly research. The core analytical approaches used in this area of research vary from time series analyses that treat house prices as a temporal variable amongst other temporal variables to hedonic studies that consider house prices alongside other property-specific variables. This section discusses hedonic price method and the way in which business cycle effects have been incorporated into this class of models.

Hedonic price method has widely been used to assess the demand for, and prices of, housing. This method is founded on the notion that housing is a composite commodity with inherent *properties* and the value of a house can be estimated by aggregating the assessed values of those separate properties. The properties are not limited to structural/physical differences of houses, but also include locational and neighbourhood characteristics. As discussed in section "Business cycle effects of house prices: The scholarly view", house prices are also influenced by the time trend and the business cycle; therefore, time-related (temporal) determinants need to be included in the hedonic model if prices are to be evaluated over time.

The widely applied contemporary hedonic model was introduced by Rosen (1974), illustrating the 'nuts and bolts' of the model within a comprehensive economic framework. This seminal paper derives 'bid functions' of utility (enjoyment) maximising consumers and 'offer functions' of profit maximising producers. The hedonic price function represents the joint envelope of bid and offer functions at the market equilibrium. Given this market equilibrium assumption, recent hedonic studies take the demand side of the market to provide reasonable estimates of willingness to pay for housing characteristics.

In Rosen's model, income is directly incorporated into the budget constraint of the consumer. Therefore, a consumer's bid price for a housing characteristic is a function of utility level, other variables influencing tastes and preferences such as education and age, and income. Since income responds to business cycles, changes in income partly reflect the effects of the business cycles. This then indicates business cycles impact upon a consumer's demand and bid prices. Recent hedonic models have thus embedded the business cycle effects into their model specifications.

The ways in which the key model specifications (i.e. cross-sectional hedonic house price model, panel model, spatial panel model and spatiotemporal hedonic model) may or may not incorporate temporal effects are demonstrated in Table 16.2. A movement from top to bottom indicates an increase in complexity. Such a movement also shows how hedonic models, and subsequently automated valuation models, evolved over time to embed business cycle effects using emerging econometric techniques. For accessibility, only a simpler and more general version of each approach is presented in Table 16.2.

We begin by considering the most common **cross-sectional hedonic model** that largely ignores the business cycle effects due to its focus on 'one point in time' (see Table 16.2). This model generally evaluates housing prices (P), taking into account structural/physical (S), locational (L) and neighbourhood (N) characteristics of houses in the sample (note: same variables are retained in all the forthcoming model specifications for consistency). Most common structural/physical attributes that appear in hedonic studies include number of bedrooms and bathrooms; floor area; type of housing (single-family/multifamily, attached/detached); number of the floor; structural features including presence of basement, fireplace and garage; age of house; availability and type of heating and cooling systems; structural material used; and quality of finish (or condition). Usual locational attributes include proximity to city centre and other amenities such as green spaces, whereas neighbourhood variables may include crime rates and social status of the local area. These indicators are strikingly similar to the factors considered in appraising the value of a house by a professional valuer (see p. 6).

The *autoregressive (AR) model* provides the basis to understand the models presented in the rest of the chapter. In relation to house prices, the AR model represents future house prices based on a weighted sum of past prices. An AR (1) autoregressive process is the first-order process, meaning that the current price is determined by the immediately preceding price. An AR(2) process models the current price based on the previous two prices. An AR(0) process symbolises white noise and depicts no dependence between the terms. The relationship between current price and past prices is inherent within panel, spatial panel and spatiotemporal hedonic models.

Hedonic panel models are an alternative, and more comprehensive, approach to evaluate the effects of spatial and temporal changes on house prices. This specification includes prices of houses at different locations and their characteristics, as well as changes of prices and characteristics over time. Therefore, this approach captures movements of the business cycles over time as embedded in household incomes,

Table 16.2 Hedonic model specifications and business cycle effects

Model specification	Model equation	Model variables	Capture business cycle effects?	Example(s)
Cross-sectional hedonic model	$P_i = \beta_1 S_i + \beta_2 L_i + \beta_3 N_i + \varepsilon_i$	P denotes the n x 1 vector of house prices; S is a (n x m) matrix of structural/physical attributes of the houses (plus the constant); L is a (n x q) matrix of locational characteristics; N is a (n x j) matrix of neighbourhood characteristics; β_1, β_2 and β_3 are m, q and j length vectors of unknown parameters to be estimated; and ε is a random error vector	No	Herath et al. (2015)
Simple panel hedonic model 1	$P_{it} = \beta_1 S_{it} + \beta_2 L_{it} + \beta_3 N_{it} + \beta_t T_t + \varepsilon_{it}$	T denotes time effects[a], and other variables as above	Yes	Zabel (2015)
Simple panel hedonic model 2	$P_{it} = \beta_1 S_{it} + \beta_2 L_{it} + \beta_3 N_{it} + \beta_t E_i + \beta_t T_t + \varepsilon_{it}$	E denotes entity effects, and other variables as above	Yes	Baltagi and Chang (1994), Kim (1993), and Mendelsohn et al. (1992)
Spatial panel hedonic model	$P_{it} = \rho W P_{it} + \beta_1 S_{it} + \beta_2 L_{it} + \beta_3 N_{it} + U_{it} U_{it} = \lambda W U + \varepsilon_{it}$	ρ denotes spatial autoregression coefficient, W is an n x n spatial weights matrix, λ is an error correlation coefficient, U is a vector of error terms and other variables as above	Yes	Baltagi and Bresson (2011)
Spatiotemporal hedonic model	$(I - W)P = (I - W)X\beta + \varepsilon$	X denotes an n x k matrix of independent variables (combining S, L and N above), β denotes a k x 1 vector of parameters (combining β_1, β_2 and β_3 above), and W denotes an n x n *spatiotemporal* weight matrix and other variables as above	Yes	Pace et al. (1998) and Nappi-Choulet Pr and Maury (2009)

[a]For instance, if the dataset includes house sales from 1990 until 2010, the time dummy variable (T) for a house that was sold in 1990 is assigned the value 1, a house that was sold in 1991 is assigned the value 2, and a house that was sold in 1992 is assigned the value 3, etc.

house prices and implicit prices of characteristics. However, the notable challenge in using panel models is the lack of data as these models require tracking prices and characteristics of the same houses over time. Since houses are traded very infrequently, one either has to rely on appraisal values – running the risk of analysing appraisal procedures rather than market development – or to stick to repeatedly sold properties, usually losing a substantial part of the available data.

Panel models are broadly twofold: the fixed effects model and the random effects model. The particularly relevant version in the context of business cycle effects is the panel model with time fixed effects. In **simple panel hedonic model 1** (see Table 16.2), the time *dummy variable* (e.g. year) starts from one and increases by one every time period. This specification includes different houses sold at different time periods, and so both i and t of P are variable; however, tracking the changing prices of the same houses over time is not a requirement. In other words, S, L and N are recorded at the time of sale of a particular house only, and the time of sale (e.g. year) may vary for different houses in the sample. T estimates any linear effect (including business cycle effect) associated with different time periods. Since the marginal effect of an additional year is always the same, this is considered a crude way of capturing the temporal effects of house prices.

The **simple panel hedonic model 2** adds *entity effects* and *time effects* (see Table 16.2) and is known as *entity and time fixed effects panel model*. The entity effect (E) represents unique characteristics that may exist in each house, apart from those already included. The time effect (T) characterises time of the house sale and controls for time-related unexpected variation or special events that affect house prices (as above). Compared to the *simple panel hedonic model 1*, this model represents house prices and housing characteristics, all of which are traced over time for the houses in the sample. In other words, house prices as well as housing characteristics are time-variable in this specification. These models take into account temporal changes including the business cycle effects in a comprehensive way (Hiller & Lerbs, 2016). As the effects of business cycles can be extracted from the time fixed effects coefficients of both above models, they can be considered a real estate price index that includes business cycle effects.

There are two other key hedonic specifications that incorporate business cycle effects. The **spatial panel hedonic model** further extends the hedonic panel model by incorporating spatial relationships that exist within house prices (Table 16.2). In this specification, house prices and housing characteristics are variable, rendering the possibility to capture temporal changes including the business cycle effects. In addition, spatial lags between prices are included as an explanatory variable [via a spatial autoregression coefficient (ρ) and a spatial weights matrix (W)], and/or spatial relationships between error terms are also incorporated [via an error correlation coefficient (λ) and a spatial weights matrix (W)].

The **spatiotemporal hedonic model** is predominantly built on the autoregressive model and considers spatial and temporal determinants of house prices simultaneously. This model is augmented to include previous values of the dependent and explanatory variables from nearby observations. Thus, spatiotemporal models deal with changes of explanatory variables (S, L and N) over time and resulting changes

in house prices P and contain both time and space-time lags of the model variables (see Table 16.2). Further details of the spatial panel and spatiotemporal models are provided in LeSage and Pace (2004) and Anselin et al. (2004).

As mentioned in section "Business cycle effects of house prices: The practitioner's view", the advancements in the valuation practice over the past decades reflect the historical expansion of the hedonic model. For example, recent AVMs are built on advanced hedonic models such as the ones discussed here to incorporate time-related dynamics including the business cycle effects.

An Application of a Simple Hedonic Model (Herath, 2013)

The above section demonstrates the way in which hedonic price method evolved over time to accommodate temporal effects of house prices. Most previous studies capture aggregate time-related change, and models examining specific impact of the business cycle are limited. One such application using an experimental decomposition method to examine separate effects of the time trend and the business cycle on house prices is discussed below.

This alternative approach uses HP filter[1] to incorporate time trend and business cycle movements of the economy explicitly into the hedonic model. The method requires selecting an appropriate macroeconomic variable that represents the movements of the economy (e.g. income), and this variable is decomposed into its time trend and cyclical component. Then, the values of time trend and cyclical component for the relevant time period (e.g. year of sale) are recorded for each house sale and then included as explanatory variables in the hedonic model. This provides the possibility to evaluate which specific components (trend, business cycle or both) have a significant impact on house prices by taking into account them as separate variables.

This method has been applied in Herath (2013) to analyse house prices in the Ede Municipality in the Netherlands from 2000 to 2008. That paper employed a spatial hedonic house price model and incorporated temporal dynamics via a time trend and a business cycle. The effects of distances from the town centres on house prices and any changes in these effects over time were examined. In addition to the findings on residents' willingness to pay for proximity to different town centres, house prices were sensitive to both the time trend and the business cycle movements of the regional economy. The business cycle had a positive impact on house prices: house prices increased during the boom phase of the economy and declined during the bust phase.

[1]The HP filter is widely used in macroeconomic studies to obtain a smooth estimate of the long-term trend component of a data series. It indicates that a data series is made up of a smoothed series (trend component) and a random series (cyclical component). This method calculates the smoothed series s of y (the chosen macroeconomic variable) by minimising the variance of y around s, subject to a penalty that constrains the second difference of s. See Herath (2013) for details.

Conclusion

Hedonic price method is a key analytical technique used to examine house prices and preferences for housing characteristics. Hedonic models have evolved to accommodate analyses of house prices over time capturing temporal changes in the economy. The modelling approaches reviewed in this chapter demonstrate temporal changes are incorporated either via categorical variables representing separate time periods or by including actual changes in variables over time. Notably, the time fixed effect coefficients of panel models can be interpreted as house price indices incorporating business cycle effects. Recent approaches also consider spatial and temporal dependencies that exist in prices and/or characteristic space. For instance, spatial panel models and spatiotemporal hedonic models are sophisticated approaches that comprehensively capture spatial and temporal changes of house prices.

The way appraisers consider business cycle effects in their housing valuations reflects these developments in the scholarly space. For instance, higher incomes or lower interest rates (as business cycles move) make housing more valuable within the appraisal process. Sales comparison approaches (i.e. a variation of hedonic-type measurements) that are used in valuation of real estate also suggest that business cycle effects should be incorporated into house price appraisals. For instance, one special case of the sales comparison approach, the Sales Adjustment Grids method, takes into account a small number of *recently sold* properties in the immediate vicinity of the subject property to value the attributes of that property. By only considering the values of recently sold properties, the appraiser aims to generate a reasonable value estimate that represents the current state of the economy and the business cycle.

Though widely used hedonic approaches consider aggregate time-related changes to accurately estimate house prices, the distinct effect of business cycles on house prices is rarely the subject of previous studies. The case study discussed in section "An application of a Simple Hedonic Model (Herath, 2013)" of this chapter presents such an application. Provided the difficulty of disentangling the business cycle and time trend, further development of dedicated hedonic approaches to exclusively analyse the business cycle effects is an important topic for future research.

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Chapter 17
Property Valuation, Transaction Prices and Market Activity



Manya M. Mooya

Abstract It is conventional theory that property valuation activity has neutral effects on transaction prices in property markets. This chapter critiques this view and argues that it prevents the proper identification of the relationship between property valuation and cycles in property markets. An alternative framework is presented, in terms of which the relationship between valuation, transaction prices and market activity is clarified. The framework is further employed to explain price bubbles in property markets which may, in certain cases, presage turning points in market cycles.

Keywords Property valuation · Transaction prices · Property cycles · Price bubbles

Introduction

Property cycles provide an ideal framework with which to examine the relationship between property valuation, transaction prices and market activity. The defining features of property cycles are periodic changes in transaction prices and market activity. As the term suggests, these changes are cyclical, typically following a boom-bust profile. Boom phases of these cycles are associated with increased transaction activity and rising prices, whereas the converse characterise the bust phases. Though not always the case, these cycles may be punctuated by 'price bubbles', whose collapse tends to signal the end of one cycle and to presage the beginning of the next. Given the centrality of transaction prices in conventional valuation theory and practice, the importance of understanding the relationship between property valuation and property cycles is immediately apparent.

Keeping in mind the causal relationship between the magnitude of transaction prices and the volume of market activity, two broad strands of scholarly enquiry are germane to the discussion regarding the relationship between property valuation and

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property cycles. The first strand, going under the rubric of 'valuation accuracy studies', examines the extent to which valuations provide a good prediction or estimation of transaction prices. This strand has a long tradition in the literature. Most studies on valuation accuracy (see, for instance, Crosby, 2000) have tended to operate under the assumption that market transaction prices were the relevant ground truth against which to judge the accuracy or otherwise of valuations. That is to say, it is conventional theory that valuations and transaction prices are independent of each other and that the former has a neutral effect on the latter. This assumption is obviously what makes valuation accuracy studies feasible and is therefore indispensable to scholars working from within conventional theory. Consequently, there hasn't been as much scholarly interest or output regarding the related question of valuer influence on transaction prices. The significance of valuation accuracy studies to the analysis of property cycles is threefold. Firstly, at certain points in the cycle, typically the turning points, transaction prices may diverge from what some analysists would regard as 'fundamental' or 'true values'. Under these conditions, there may exist an intuitive feeling within the valuation profession in the relevant market that contemporaneous transaction prices are no longer providing valid indicators of 'true' market values. Valuation accuracy under these conditions thus has to contend not only with the prediction of transaction prices but also with prediction of 'true' market values, of which there may be no market evidence. Secondly and relatedly, the question of whether price bubbles – defined as dramatic rises in *real* prices, where such an increase is not supported by 'fundamentals', followed by a fall to at least the pre-increase levels (Lind, 2008) – can be identified and their magnitude measured is a valuation accuracy problem. That is to say, if valuers are able to correctly determine the 'true' value of property, they would be able to detect price bubbles and consequently to provide indicators regarding turning phases of the property cycle. In a falling market, 'true' market values would be significantly lower than transaction prices. Conversely, in a rising market, 'true' market values would be significantly higher than transaction prices. Thirdly, if one accepts the thesis, as we do, that there is a causal relationship between valuations and transaction prices, it follows that valuations have the possibility of triggering, or at any rate amplifying the amplitude of, property cycles. If valuation accuracy studies can be categorised as cross-sectional in nature, the second strand of inquiry regarding the relationship between property valuation and property cycles has a longitudinal orientation, being interested in the extent to which future transaction prices can be accurately predicted. Valuation is a forward-looking activity, especially where it involves the application of the discounted cashflow method. Thus the ability of valuers (and other market analysts) to accurately forecast future property market variables, such as prices, rents, vacancies, capitalisation rates, etc., is of paramount importance. The existence of cycles in property markets, which implies that these variables are liable to change significantly, presents forecasters with obvious challenges.

This chapter examines the relationship between property valuation, transaction prices and market activity in theoretical terms. The discussion is centred around two key related arguments. Firstly, it is claimed that, contrary to the tenets of

conventional valuation theory, there is potentially a direct causal relationship between the magnitude of valuations and eventual transaction prices. Secondly, it is argued that conventional valuation theory does not provide an appropriate framework from within which to fruitfully analyse price bubbles and the relationship between property valuation and cycles in property markets. Subsequently, an alternative theoretical framework is presented, in terms of which the relationship between valuation, transaction prices and market activity is clarified. The framework is further employed to explain price bubbles in property markets. The chapter is structured into seven sections as follows. The following section describes conventional theory regarding the relationship between property valuation and transaction prices. The third section offers a critique of conventional theory, to demonstrate why this does not provide an appropriate, or sufficient, framework with which to analyse property cycles. The fourth section presents the ontological and methodological foundations of the alternative theoretical framework. This framework is presented in the fifth section and shows how valuations may influence transaction prices and property cycles. The framework is further employed, in the penultimate section, to explain price bubbles. Concluding comments follow thereafter in the final section.

Property Valuation and Transaction Prices in Conventional Theory

The Ontology and Methodology of Conventional Valuation Theory

The ontological and methodological foundations of conventional valuation theory are rooted in the doctrines of conventional economic theory, alternatively described as neoclassical economic or mainstream theory. The essential tenets of the neoclassical economics framework can be summarised as follows: adherence to a positivist ontology and explanation grounded in methodological individualism, rational choice and equilibrium. Positivism holds that there is a distinction between the knower and the known (or knowable) and that the former can objectively apprehend the latter through *empirical* observations or data. Positivism espouses a 'flat ontology', in terms of which reality consists of that which can be discerned through direct sensory experience. In the context of property valuation, positivism makes for a strict distinction between the valuer, on one hand, and market value, on the other (i.e. between valuations and transaction prices), with the former relying on (empirical) transaction prices to gain knowledge of the latter. Methodological individualism is a mode of explanation that builds an aggregate picture of social phenomena (such as the 'property market') from the analysis of the behaviour of individuals that constitute that aggregate. In terms of methodological individualism, the property market is conceived as a summation of *numerous* individuals, each one of which acts independently of everyone else. Thus, in terms of this conception, the market

demand (and supply) schedules are regarded as a summation of the demand (and supply) schedules of the individuals (i.e. buyers and sellers) who collectively constitute the market. Rational choice is the view that the individuals who constitute the market are able to choose from among alternative courses of action and act in accordance with those choices. The exercise of rational choice requires that individuals have access to the requisite and *full information* for decision-making and that they have the cognitive ability to do so. To fit the test of economic rationality, choices must be *complete* (i.e. individuals are able to choose between alternatives or express indifference between them) and transitive (i.e. if option A is preferred to option B, and B to C, then option A must be preferred to option C). In practice, rational choice leads to the notion of *homo economicus*, the construct of a utility-maximising individual, as the defining feature of individual human behaviour. Taken together with methodological individualism, rational choice opens the way for the prediction of behaviour at both the individual and social level, allowing for statements of the form if x, then y. Thus, it follows, human beings (and social phenomena such as markets) will act or behave predictably and in the same way, under repeated extrinsic conditions. The application of the doctrine of rational choice to conventional valuation theory and practice is reflected in the prescript that valuers, when analysing the property market, mimic the dispositions and attitudes of participants, especially that of potential buyers. If these participants are held to act in terms of rational choice, valuers are required to mirror that behaviour. Thus valuers are expected to act methodically and objectively and to have a completely instrumental approach to the analysis of property markets. Equilibrium is the notion that economic forces (i.e. supply and demand) are always in, or tend towards, balance (Mooya, 2016). It is the logical outcome of the activities of numerous self-interested individuals acting out their rational choices in competitive markets. Mooya explains that the concept can be understood either in a narrow sense ('static equilibrium') or more broadly to include general and dynamic equilibrium. In property markets, static equilibrium is theorised to account for the level of prices in a given market at a given point in time, i.e. supply and demand in equilibrium explain property prices (*ibid*). More significantly, from a valuation point of view, prices established by markets in equilibrium are held to be valid measures of market value. This is the basis for the use of transaction prices as proxies for market value in conventional valuation theory. General equilibrium theory in property markets on the other hand posits that the level of prices can be understood as arising from a balance in, and between, markets for the determinants of these prices, such as labour markets, financial markets, rental markets, etc. (*ibid*).

Property Valuation and Transaction Prices in Conventional Theory

Though not readily apparent, the professional practice of property valuation is based on the foregoing fundamental assumptions of conventional economics theory. We

shall return to them in the following section, to argue, firstly, that they are not valid representations of the relevant reality and, secondly, that they stand in the way of a proper understanding of the relationship between property valuation, transaction prices and property cycles. For the present, it would be useful, using the empiricism of positivism and the concept of equilibrium, to amplify the relationship between property valuation and transaction prices in terms of conventional theory. Market value, which is the main focus of most property valuation activity, is defined as 'the estimated amount for which an asset or liability should exchange on the valuation date between a willing buyer and a willing seller in an arm's length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion' (IVSC 104 Bases of Value para 30.1, 2017). The assumption that parties are required to act in accordance with the principles of economic rationality is quite obvious in this definition. Crucially for our purposes, and consistent with the empiricism of positivism, this is a price definition (French, 2006), the goal of market valuation being to establish an empirical fact. As Crosby (2000) puts it, market valuation is an attempt to identify the exchange price in the market price at the date of valuation. It is important to emphasise that the market price (as a proxy for market value) is, in terms of conventional theory (and valuation standards), required to be a single-point determinate quantum, whose existence and magnitude are independent of the valuers' wishes (or the wishes of any individual market participants for that matter). That is to say, valuers and their valuations are assumed to not have any influence on the magnitude of transaction prices in the market. In terms of this view, valuers merely report on, or reflect, the market and do not 'cause' transaction prices (and market values). This, of course, implies that valuations are assumed to have a neutral effect on property market cycles. The definition of market value requires that, for transaction prices to be evidence of market value, the market in question must be sufficiently competitive so as to allow a pattern of prices to emerge. This is where the concept of equilibrium comes into play. In essence market value is the price arrived at, or indicated by, property markets in equilibrium. To put it differently, it is conventional economics that property will exchange hands at prices on the intersection between the demand and supply curves. Since market value is evidenced by transaction prices, it follows that market value is the equilibrium price. It is difficult to conceive of market value as a sufficiently stable and determinate amount, which is other than the price established by markets in equilibrium. Equilibrium theory is central to both strands of scholarly enquiry identified in the introduction to this chapter as being relevant to the discussion regarding the relationship between property valuation and property cycles. This is because the concept of equilibrium is essential to the conventional understanding of valuation accuracy and price bubbles and to the forecasting of future trends in market prices. The concept provides the basis for both the conventional definition of price bubbles and the construction of requisite bubble indicators. A bubble, after Lind (2008), involves a dramatic rise in real prices, a rise not explained by 'fundamental' forces, followed by perhaps an equally dramatic fall. A price bubble can thus be conceived as a (temporary) departure from equilibrium. The notion of valuation accuracy, for its part, measures the extent to which a

valuation differs from a contemporaneous sale price for the same property. The reference sale price is not just any sale price, but only an equilibrium price, set in competitive markets, i.e. one that corresponds with the 'true' market value.

A Critique of Conventional Theory

There is an extensive literature, broadly categorised under the rubric of heterodox economics, which is highly critical of mainstream economics in general and of the assumptions presented above in particular (see Gillies, 2004; Hendry, 1980; Hodgson, 2009a, b; Leamer, 1983; Lawson, 1997, 2003, 2005, 2006, 2009). It is not proposed, in this chapter, to go into any great detail into this criticism. The key point to make is that the heterodox literature finds that virtually all of these assumptions are of very limited validity, particularly when applied to property markets. In this section we reinforce this argument and make the further argument that these assumptions make conventional valuation theory ill-suited for the analysis of cycles in property markets. Starting with the assumption of equilibrium, it is clear that the concept does not accurately describe the reality of property markets. As the subject matter of this book attests, cycles in property markets are pervasive. It is a well-known feature of the housing market, for instance, that periods of growth are regularly and invariably punctuated by periods of decline, boom following bust in a never-ending cycle (Parker & Filatova, 2008). The financial crisis of 2008 is eloquent testimony, the latest chapter in a long-running saga. It is quite obvious that cyclicity is inconsistent with equilibrium. The critical point to make in this context is that, by emphasising equilibrium and stability, traditional models of the market are, by definition, ill-equipped to handle change in property markets. Change is of course the defining feature of property cycles. The assumption of rational choice for its part is undermined, on one hand, by human beings' inherent weaknesses in computation ability, memory and perception (Parker & Filatova, 2008) and the complexity of the decision environment on the other (North, 2005). This is the so-called C-D gap (*ibid*). The decision environment in property markets is of course defined by high transaction costs, caused mainly by information problems (Mooya & Cloete, 2007; Mooya, 2009). In addition to ignoring positive transaction costs, the implication of methodological individualism is that the effect of agent-to-agent interactions is ignored (Parker & Filatova, 2008). Yet these interactions are ubiquitous and are especially prevalent during price formation and price negotiation. These interactions play a significant role in overall market psychology, for example, in the manias which accompany bubble formation and the panics which accompany their collapse. These interactions may thus play a significant role in the genesis and evolution of cycles in property markets. That conventional theory ignores these interactions makes it ill-equipped to handle such market circumstances. The construct of homogenous, representative agents underlying methodological individualism is confounded by the reality of heterogeneity in the makeup of players in property markets. As Parker and Filatova (*ibid*) observe, several types of buyers

and sellers constitute property markets, with different motivations, opportunity costs, types of behaviour and pricing strategies. Even within the same type, buyers and sellers differ in their location preferences, motivations, resources and information (*ibid*). The notion that one can build an aggregate picture of the property market by analysing the behavior of typical and representative buyers and/or sellers is clearly too farfetched. With respect to the positivist methodology of conventional theory, there are two sets of problems. Firstly, the empiricism of positivism can only provide a partial view of the reality of property markets. As Mooya (2016) points out, it is not possible, from the perspective of any one market player, to empirically observe the full or accurate picture of what actually happens in the market, even in that segment that is directly relevant for their own decision-making, such as pricing. The reason is that officially recorded transaction prices may not be the actual prices at which properties may have exchanged hands. Further, what can be observed is only a fraction of what actually happens, due to incomplete records or unreported transactions. To be included in the mix are transactions that have not happened for a variety of reasons, including due to lack of finance, due to parties changing their minds or for regulatory reasons (*ibid*). These aborted transactions are as much a part of the market as are the consummated ones. The second set of problems of positivism are more directly relevant to the case we are trying to build. They emanate from the 'flat' ontology of positivism. The positivist focus on what can be experienced as the totality of reality stands in the way of the appreciation of the structured nature of reality and the fact that what can be observed, or is observable, is nested in/caused by deeper, unobservable, underlying mechanisms and processes. These mechanisms and processes are as real and consequential as are the sensory experiences. That they remain beyond the purview of positivism creates limitations when it comes to the understanding or explanation of structured events, such as cycles in property markets. To properly understand empirical facts, such as price formation, and changes that occur during the different phases of the property cycle, one needs to look below the surface of prices, rents, vacancies, etc., to the underlying causes and mechanisms. We develop this argument further in the following section.

The Alternative Framework: Ontological and Methodological Foundations

The framework that, in section "Property valuation, transaction prices and property cycles: An alternative framework", presents an alternative explanation of the relationship between property valuation, transaction prices and property cycles draws from tenets of critical realism and elements of the new institutional economics. In this section we present the ontological and methodological foundations/assumptions of this framework and contrast these with those of conventional theory discussed above. The alternative framework that we develop is based on fundamentally different assumptions from that of conventional theory. Instead of the flat ontology

of the empiricism of positivism, the framework is based on the stratified ontology of critical realism. Rather than the methodological individualism of conventional theory, it relies on methodological holism, to develop an understanding of social phenomena as a product of two-way interactions between the social and the individual. The framework rejects rational choice in favour of a restricted form of rationality, called bounded rationality. Finally, the stability of social phenomena, such as markets, is explained, not by means of competitive equilibrium, but by a system of order, based on rules, conventions and norms.

A Stratified Ontology

As indicated above, positivism holds that reality is what can be experienced empirically. In contrast the critical realist view, however, avers that the empirical level is just but the topmost of a three-tiered social reality (Mooya, 2016). Like the tip of an iceberg, what is actually observed empirically is the outcome of an underlying scaffold arranged in three strata or domains, namely, the *empirical* (experience and impression), the a*ctual* (actual events and states of affairs in addition to the empirical) and the *real* (structures, powers, mechanisms and tendencies, in addition to actual events and experiences) (Lawson, 1997). Each of the three domains of reality is associated with a distinctive operational concept (Mooya, 2016). The empirical is associated with *experiences*, the actual with *events* and the real domain with *mechanisms*. The empirical domain thus includes observable experiences, the actual domain includes actual events which have been generated by mechanisms, some of which are never experienced empirically, while the real includes the mechanisms (or structures) that have generated (or produced) the actual events (*ibid*).

Mooya (2016) applies the stratified ontology of critical realism to property markets from the instructive perspective of a potential purchaser (which, as we have noted, is the perspective that valuers implicitly assume); thus, at the level of the empirical, the prospective purchaser will have knowledge of transaction prices of properties similar to that of interest. The transaction prices that he or she will have knowledge of, however, will be but a fraction of transaction prices and other events actually happening in broadly the same market segment at the *actual* level. Examples include search processes done by other players in the market, the bargaining that happens during sales negotiated, the payment and receipt of capital or rental sums and the navigation of various statutory requirements and procedures.

Thus, below the empirical level of observed prices lies the actual level of property market activity, where numerous events actually take place, many of which our buyer (or valuer) could not and will not observe (Mooya, 2016). It is important to note that the actual domain encompasses events that have *not* happened, i.e. putative and aborted transactions. Actual events in real estate markets are in turn 'caused' by the property market mechanism which lies in the deeper real domain. The market mechanism is what makes it possible for him or her, if their offer price is acceptable, to acquire the ownership rights to the specific property from a seller, who they may

never have met before. Our buyer (or valuer) cannot empirically apprehend the market mechanism, which lies in the real domain. Its effects, however, can be seen in events at the actual level and in the buyer's experiences at the empirical. The basic function of the mechanism is to 'cause', or facilitate, the transfer, or acquisition, of rights to property using the price system (*ibid*).

The value of the stratified ontology of critical realism to the analysis of property cycles is that it allows us to deploy the concept of emergence (Mooya, 2016). Emergence may be defined as 'a relationship between two features or aspects such that one arises out of another and yet, while perhaps being capable of reacting back on it, but causally and taxonomically irreducible to it' (Lawson, 1997: 63). Lawson (2003: 44) expands the definition of the concept; thus:

> a stratum of reality can be said to be emergent, or possessing emergent powers, if there is a sense in which it (i) has arisen out of a lower stratum, being formed by principles operative at the lower level; (ii) remains dependent on the lower stratum for its existence; but (iii) contains causal powers of its own which are irreducible to those operating at the lower level and (perhaps) capable of acting back on the lower level.

Macroscopic changes in prices, including price bubbles, and other secular manifestations of cyclical behavior in property markets, are instances of emergent phenomena (Mooya, 2016). In terms of this conception, patterns of market value (or market prices) and volumes of transaction activity that co-vary with them, in line with different phases of the property cycle, are held to be emergent properties of property markets (*ibid*). That prices are an emergent feature of (competitive) property markets is easy to see in terms of Lawson's characterisation of the phenomenon. Prices emerge as a result of the various (inter)actions of market participants in the actual level, whose actions are, in turn, 'caused' by the underlying market mechanism (*ibid*). Having emerged from this underlying stratum, prices take a life of their own at the empirical level. Patterns of prices at the empirical level will depend on the events in the actual level for their continued sustenance but will also react back at the lower level, influencing what actually happens there (*ibid*).

Methodological Holism

In contrast with methodological individualism, methodological holism regards individuals as reciprocally influencing both each other and the aggregate social phenomena of which they are part of. Whereas in methodological individualism an aggregate phenomenon like the property market is regarded as simply the sum of independent individual buyers and sellers, sequentially summed together, one after the other, in holism the aggregate is different and much more than the sum of its constituent parts. In the context of property markets, the fact that, for example, the pricing decisions of individuals are contingent on the bids and activities of other players, as well as pre-existing patterns of prices in the market, is consistent with methodological holism. Individual players in property markets do not make

decisions in isolation or independently of other players or the state of the market. This is most obviously manifest during price bubbles and crashes.

Critically for our purposes, emergence is central to holism, due to the thesis that the whole is different from the sum of the individual constituents. Aggregate market phenomena like market prices and cycles are emergent phenomena in the sense defined above. In explaining emergence in property markets, methodological individualism perfectly dovetails with that of the stratified ontology of critical realism. This can be summarised as follows. In competitive property markets, patterns of prices will emerge from the interactions of numerous individuals. Crucially, these prices will tend to exhibit a certain degree of autonomy from the individual preferences of the players in the market. Further, the prices will not only exhibit relative autonomy from the wishes of the market players, but they will also influence what these players actually do. The level of prices will act either to stimulate or depress incentives to buy or sale, as the case may be.

Bounded Rationality and Social Order

Bounded rationality is the idea that decision-makers are limited in their ability to make completely rational decisions due to the complexity of the decision-making environment on one hand and limitations on the cognitive capabilities of the decision-maker on the other. This ubiquitous state of affairs creates what North (2005) described as the C-D gap alluded to earlier, 'gaps that frequently exist between the difficulty of social problems and the competence of individuals to solve them'. In the context of the property market, the complexity of the environment for decision-making is a result of transaction costs faced by market participants, due principally to lack of information. Rational choice is only possible in markets closely resembling the perfect market of neoclassical economics – characterised by full information and numerous homogenous players trading in a homogenous product where price and quantity are the only variable that mattered. Property markets are the very antithesis of this ideal market, and the construct of perfect economic rationality is clearly untenable.

Of particular relevance is the incontrovertible finding that when human beings are faced with a complex decision situation which cannot be easily navigated, they rely on heuristic devices, such as rules and conventions. In one sense, rules have the effect of reducing the flexibility of individual choices (North, 2005), thereby channeling behaviour into predictable patterns. In this way, rules, rather than competitive equilibrium, become the source of social order and basic stability. As Mooya (2016) points out, there exist in society patterns of behaviour that are stable over various timescales. A good example is the fact that aggregate prices for many goods and services, including property, tend to be reasonably stable and predictable (*ibid*). According to critical realism, social facts are stable and predictable because they are structured (by rules and conventions, among others). This approach to explaining the stability of social facts (such as prices) is radically different from

conventional, neoclassical explanations. Neoclassical economic theoretic explanations of social order have rational, utility-maximising individuals, competition and equilibrium at its core. The neoclassical view sees stability as arising, endogenously, from the actions of numerous self-interested individuals. In contrast, critical realism holds that exogenous factors, such as institutional contexts, cultural habits and political constraints, provide the basis for stability. In terms of this view, therefore, it is social structure, rather than competition and equilibrium, that is the source of systemic stability in a market economy (Ackerman, 2002).

In another equally important sense, rules and conventions play the critical role devices for coping with the ignorance that transacting parties may have about each other's true positions and preferences and stabilise expectations, thus reducing uncertainty (Mantzavinos, 2001). The emphasis here is on the role of rules and conventions as mechanisms for reducing transaction costs faced by market payers. In a series of articles, Mooya (2009, 2011, 2016) argues that 'market value' should rightly be viewed as a social convention, whose function is to facilitate transactions between self-interested individuals participating in complex property markets. The pursuit of self-interest, coupled with information asymmetry between the parties in these markets, creates both incentives and considerable opportunities for social conflict (Mooya & Cloete, 2007). In addition, the complexity of the property market, especially the lack of information, makes it difficult for individuals to make decisions without some sort of reference frame.

In these circumstances, 'market value' provides a benchmark that market participants can use to compare various property interests, calculate rates of return/risk and evaluate relative investment strategies (Ramsey, 2004). As Ramsey (2004) argues, 'market value' is a mechanism to provide for the coordination of market participants operating in imperfect real estate markets, markets in which the normal price signals do not provide sufficient information or guidance to market participants. The role of valuers therefore is to set conventions or standards with respect to 'market value', thereby facilitating transactions in real estate markets where the normal price signals do not provide sufficient information or guidance to market participants (Ramsey, 2004). Rather than standing outside markets as dispassionate observers, as is conventionally assumed, valuers are an integral part of the market, actively involved in the construction of the social reality that is market value. 'Market value' so created is the basis upon which decisions on lending, borrowing, trading and taxation, among others, rest (Mooya, 2011).

As has been repeatedly emphasised, real estate markets are characterised by high transaction costs caused by information problems. In particular, agents need information about the distribution of prices given a property of given specifications. Further, once a prospective transaction partner has been found, agents need 'anchoring' information with which to assess what is likely to be their partner's true position, in order to set the parameters for bargaining. This information may not be easily available and/or may be costly to acquire (Mooya, 2009). These information problems therefore create incentives for institutions specialising in information intermediation to evolve (Miceli, 1988). Such institutions (and organisations) can take advantage of economies of scale in information gathering, lowering transaction

and information costs for market participants (Baryla & Zumpano, 1995). This is the role played by valuers (and estate agents). The principal reason for the existence of these professions can be attributed to information problems in property markets (Miceli, 1988). They are producers and sellers of information about property markets, performing the important function of bringing together buyers and sellers who generally lack information (Mooya, 2009).

Mooya (2009) argues that valuers are not merely passive gatherers of market information. On the contrary, they actively create information, even where none existed before, to enable real estate markets to function. In the face of information problems in these markets, the concept of 'market value' is an institutional innovation, a 'rule of the game' without which these markets will not function well (*ibid*). By estimating the 'market value' of a property, a valuer is effectively laying down a rule for the market in question. The word 'rule' is used, not in the injunctive sense, but rather in the sense of a norm or convention. Mooya stresses that valuers do not consciously set out to impose these norms on the market, but this nevertheless is the effect of their actions. Once 'market value' has been provided, market participants need not personally search for the distribution of prices. Further, it provides an anchor upon which bargaining between the participants can be based. 'Market value' is thus a device for lowering transaction costs. Its function is to stabilise market expectations by providing pricing information (*ibid*).

A number of important conclusions follow from the conception of market value as a convention. Firstly, like all social rules (see Lawson, 2003), market value only carries normative or legitimating or facilitating force. There is thus, for each property, no 'right', 'true' or 'intrinsic' market value. The implication of this is that intellectual efforts at improving valuation accuracy are ultimately an exercise in futility. Secondly, 'market value' may be established for any market, whether thinly or actively traded, i.e. there is nothing that stops valuers from attaching 'market value' to a property, even where there is no market evidence. Thirdly, and relatedly, valuers are not merely passive observers and reporters of property prices as conventionally understood, but rather play an active part in the creation of market value ex nihilo (Mooya, 2009). Valuers can and do influence, even determine, prices in property markets. These latter two conclusions are critical for understanding the roles that valuations and valuers potentially play in the genesis and evolution of property cycles. We turn to this directly in the next section.

Property Valuation, Transaction Prices and Property Cycles: An Alternative Framework

The attempt to include real estate market cycle inside property valuation is not new. In his famous work on overall capitalisation rate determination, Kazdin addressed the importance of including business cycle in capitalisation rate calculation (Kazdin, 1944). The first attempt to include property market cycle analysis was conducted by

Born and Phyrr (1994). This scientific work can be considered fundamental in the relationship between property market cycle and valuation. Further contributions have been proposed by d'Amato (2013, 2015, 2017). Readers are referred to these articles for some background and additional context.

The focus of the present effort is to show how the assumptions in the previous section could be applied to explain the relationship between property valuation, transaction prices and property cycles. The role of property valuation is to create the pricing information, from 'scratch' if necessary but in accordance with prescribed protocols, without which various property market activities couldn't take place. This pricing information is used as the basis for negotiations as market participants are unlikely to solve the pricing problem themselves in the way they could for other less complex commodities and markets. To put it differently, due to high transaction costs in property markets, buyers and sellers of property heavily rely on valuation advice to conclude property transactions, resulting in valuations having a direct influence on prices achieved.

When a valuer makes an estimate of 'market value' for a property, this provides an anchor or basis for price negotiations agents in property make and therefore influences subsequent sale prices. These sale prices are, in a subsequent period, taken as evidence of market value by valuers, setting in motion a feedback loop. Mooya (2016) explains this as follows: 'Property X has been sold for price Y, therefore Y is its market value, the market value of property X is Y because it has been sold for Y'. It can easily be seen how this feedback mechanism could, in an atmosphere characterised by generalised expectations of price changes, act to reinforce or amplify cyclical trends in property prices. The mechanism may indeed help to trigger price bubbles and crashes. Further, the fiction of valuer detachment has the effect of inhibiting any incentive to dampen this feedback mechanism.

If this analysis is valid, and there is every reason to suggest that it is, valuers and valuations play a much more central role in the genesis and evolution of property cycles than is probably generally realised. This is not to say valuers are the only or the most significant factor. Rather this analysis suggests that, out of the myriad of factors and causes that go to explain property cycles, the role that valuers play is potentially far from being insignificant.

Explaining Price Bubbles in Property Markets

As pointed out before, property cycles often end or begin with price bubbles. It follows, therefore, that the proper understanding of the phenomenon is essential to the understanding of cycles in property markets. The problem with the understanding of price bubbles in property markets is that conventional valuation theory lacks the necessary standpoint from which to properly perceive them. As we have noted before, standard definitions of price bubbles reference a significant divergence of market prices from the 'true' or fundamental value of property. To repeat Lind's definition, a bubble involves a dramatic rise in real prices, a rise not explained by

'fundamental' forces, followed by an equally dramatic fall (Lind, 2008). Two assumptions in conventional theory are critical in this definition and for the analysis of price bubbles in property markets, namely, the existence of a correct or fundamental value and (an inexorable tendency towards) equilibrium. The argument is that the failure of standard theory in this respect has a lot to do with these two assumptions.

Given that market prices are easily observable empirical facts, the problem appears to be the determination of true market value and deciding the point at which the former has diverged sufficiently from the latter so as to signal the presence of a bubble (Mooya, 2016). Notwithstanding the fact that valuers are aware of the distinction between market price and market value, the positivist philosophy and flat ontology on which standard theory is based leaves them without an appropriate analytical standpoint from which to perceive bubbles (*ibid*).

The flat ontology of the positivist standard theory, and the conflation of market price and market value that this sustains, is the immediate reason why valuers, for the most part, are unable to perceive price bubbles in property markets, and if they do, are disinclined to do anything about it (*ibid*). As stated above, the existence of a fundamental or correct market value, from which market prices diverge significantly during bubble periods, is one of two critical assumptions of standard theory. The foregoing shows that standard theory does not, in practice, provide the capability with which this divergence could be usefully exploited. The second critical assumption is that of market equilibrium. Prima facie, this assumption is also problematic in the context of price bubbles. The emphasis of equilibrium is on market stability, whereas price bubbles and crashes are symptomatic of markets undergoing (what may be drastic) change. This fact, on its own, should raise serious doubts about the appropriateness of standard theory for the understanding of price bubbles (*ibid*).

Critical realism on the other hand provides a very powerful analytical standpoint for the understanding of emergent phenomena like price bubbles. Consistent with this framework, Mooya (2016) describes the results of numerous experimental studies as follows:

When numerous heterogeneous agents, following relatively simple rules, are allowed to interact at the local level, relatively stable and more complex macroscopic patterns (i.e. emergent phenomena) arise at a higher level. Secondly, emergent phenomena tend to exhibit novel properties that are not reducible to the constituent microelements or interactions at the lower level. Thirdly, the emergent phenomena, while stable within some definite analytical timescales, are inherently unpredictable. Finally, emergent phenomena have downward causation effects, such that, having formed, they influence the subsequent behaviour of agents on the lower level.

Applied to property markets, this framework holds that the interactions of numerous buyers and sellers (among other actors) at the actual level of property markets result in the emergence of aggregate patterns of prices at the (higher) empirical level (Mooya, 2016). These aggregate patterns of prices exhibit all of the properties of emergent phenomena as summarised above. Price bubbles (and crashes) are emergent phenomena in exactly this sense. To distinguish them from the 'normal' patterns of prices, bubbles and crashes are best conceived as temporal

amplification of secular trends, arising from the effects of both positive and negative feedbacks (of which valuations play a key role). The key argument here is that once the assumption of equilibrium is taken away from competitive markets, self-reinforcing asset price changes (i.e. price bubbles and crashes) become both inevitable and explicable (Arthur, 2013).

Results from experimental studies, such as the Santa Fe Artificial stock market and others, have yielded the following three critical insights into price bubbles, all of which are evident in real-life bubbles (Mooya, 2016). Firstly, under the prescribed market conditions (i.e. relatively competitive markets), bubbles emerge inevitably and spontaneously (i.e. price bubbles can neither be prevented from occurring or predicted). Experimental studies have shown that bubbles appear even when market participants have both the necessary information and capability to price assets correctly in terms of standard valuation models. Further, it has been shown that bubbles appear even when speculation is not possible, or when overconfidence is absent. These bubbles have proven robust to a variety of conditions, including short-selling, margin buying and insider trading. Secondly, price bubbles exhibit a definite temporal dimension. Though usually only appreciated in retrospect, they appear and disappear in distinct historical time (and/or space), i.e. they are cyclical. The markets in which they occur exhibit what Arthur (2013) referred to as clustered volatility. This is the appearance of random periods of low price volatility followed by periods of high price volatility (*ibid*). The periods between these periods, being entirely random, can be short or relatively long. This, of course, is what property market cycles are.

The lessons generated from experimental price bubbles and crashes apply equally well to actual property markets. The explanation in this case, according to Mooya (2016), goes as follows. The necessary conditions required are competitive property markets and at least two ontologically distinct levels of reality (i.e. the actual and the empirical). The activities of numerous buyers and sellers at the actual level generate aggregate patterns of prices at the empirical level. Periodically, an event (perhaps random or idiosyncratic, such as a rumour, or an 'incorrect valuation') may perturb this pattern, triggering, say, a localised rise in prices. Due to the recursive relationship between the empirical and the actual, the rise in prices will cause the behaviour of market players to change. Anticipating further price rises, the individual behaviour of the players will be adjusted accordingly. This sets off a positive feedback mechanism which, in time, leads to a price bubble. The bubble will burst and a crash ensue when another (perhaps random or idiosyncratic) event triggers a localised fall in prices and sets off forecasts of further price falls.

Just like their experimental cousins, bubbles and crashes in relatively competitive property markets are unpredictable, inevitable and cyclical (Mooya, 2016). The timescales and spatial extent between events varies and could be short or long and narrow or wide, respectively. The reason why bubbles will happen even where the participants are fully informed, can correctly price property in terms of standard valuation models and are not engaged in speculative behaviour is that individual behaviour and price bubbles occur on different ontological planes (*ibid*). Price bubbles are ontologically distinct from the individual behaviour that causes or

facilitates them. Like all emergent phenomena, the occurrence and progression of price bubbles cannot necessarily or accurately be inferred from an analysis of the behaviour of *individuals* who co-create them (*ibid*).

Concluding Summary

This chapter aimed to provide new insights into the analysis of property cycles by way of the development of two related arguments. The first is that conventional valuation theory does not provide an appropriate framework from within which to fruitfully analyse price bubbles and the relationship between property valuation and cycles in property markets. The reason for this has been attributed to a theoretical framework that is ill-equipped to handle market crises and instability and to conventional views that preclude the possibility of valuer influence in the pricing of property. The second argument is that, contrary to the tenets of conventional valuation theory, there is potentially a direct causal relationship between the magnitude of valuations and eventual transaction prices. It is our contention that valuers and valuations influence subsequent transaction prices, as much as these prices influence subsequent valuations. The alternative theoretical framework presented in this chapter, in terms of which the relationship between valuation, transaction prices and market activity is clarified, places valuers and valuations at the centre of the analysis of property cycles.

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Chapter 18
Methodological Integration Between Property Market Cycle and Valuation Process: Extended Cyclical Capitalization Models

Maurizio d'Amato

Abstract The dividend discount model (Gordon M. The investment, financing and valuation of the corporation. Irwin, Homewood, 1962; Gordon M, Shapiro E. Manag Sci, 102–110, 1956, October) is widely accepted among professional and academician as a further approach to capitalization. Although the explicit growth modelling is normally applied both for property valuation and assessment of worth, the model is procyclical creating problems in the upturn and downturn of the market (Born and Pyhrr 1994). In this paper, four further cyclical capitalization models are proposed to be applied to a wider group of property valuation cases such as the so-called cyclical assets (International Valuation Standard Council. International valuation standards, 2020).

Keywords Property valuation · Market cycle · Cyclical capitalization

Introduction

In the valuation process, it is possible to see five "sources of uncertainty" (IVSC, TIP Valuation Uncertainty, para 12.4). One of them is model uncertainty which "...arises from characteristics of either the valuation model or method used.... In certain valuation models the outcome may be disproportionately sensitive to small variations in the input data, for example due to gearing effects in the model..." (IVSC, TIP Valuation Uncertainty, para 12.4). The importance of property market cycle is raising in the valuation standards. The International Valuation Standards warned on the determination of terminal value in the Discounted Cash Flow (DCF) analysis as follows: "...for cyclical assets the terminal value should consider the cyclical nature of the asset and should not be performed in a way that assumes "peak" or "trough" levels of cash flows in perpetuity..." (IVS, 2020, General Standards – IVS 105 Valuation Approaches and Methods, para 50.21 letter e). The

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"terminal value at the end of the explicit forecast period is then determined and . . .discounted back to the valuation date to give an overall value for the asset or business. . ." (IVSC, TIP 1 DCF, para 6). The role of the property market cycle is also recalled in other contexts. In the valuation process, it is also required that ". . .in the valuation of cyclical assets, the explicit forecast period should generally include an entire cycle, when possible. . ." (IVS, 2020, General Standards – IVS 105 Valuation Approaches and Methods, para 50.9 letter d). This chapter deals with cyclical capitalization models (d'Amato, 2015, 2017a, b; d'Amato & Amoruso, 2018; d'Amato et al., 2019a, b; Renigier Bilozor & d'Amato, 2017). In particular, it is proposed a methodological solution to allow a wider application of these models. The model of cyclical capitalization is normally based on the dividend discount model of Gordon Shapiro dividing the value in several slices of value discounted at the date of valuation. The traditional dividend discount model for infinite rents is based on the assumption that the discount rate or target rate of return is greater than the growth (g) factor. In the following sections, this assumption will not be necessary anymore, because the value is reached as a sum of different limited progressions in which the growth rate may be greater or lower than the discount rate.

The chapter is organized as follows. In the following section, there is a discussion on the g factor and the origin of dividend discount model and its evolution, cyclical capitalization. In the same section, there will be a presentation of the basis of the cyclical capitalization whose mathematical underpinning is recalled in Appendix 1. Following section will show further cyclical capitalization models in which the growth rate can be greater or lower than the discount rate. The mathematical underpinnings of the four further models proposed are indicated in Appendix 2. Simulation of these models will be presented, and final remarks will be offered at the end.

Growth Rate

Property valuation methodologies are not constant all over the time. They represent a part of the economy of a country following the evolution of the economic and social system. The introduction of dividend discount models (Gordon & Shapiro, 1956; Gordon, 1962) in the valuation process is mainly caused by this evolution. "In the post-1960 economic conditions, the conventional model came under increasing pressure due to change in investor's perceptions. In the 1970s and 1980s the reverse yield gap was significant, and growth potential began to dominate property price" (Baum & Crosby, 2014, p. 104). The consequence was the introduction in the valuation process of several modifications including income-oriented models dealing with the growth. The pioneering works on dividend discount models (Gordon & Shapiro, 1956; Gordon, 1962) became a useful tool to address the new challenges of the real estate market. Global Financial Crisis (2008) showed again the limitations of current property valuation methodologies based on income approach. The raising question is how to improve existing income methodologies dealing with cyclicalities

of real estate markets. In fact traditional valuation techniques seem to be less successful and even fail during down market times (DeLisle & Grissom, 2011). For this reason Kazdin stressed the importance of including business cycle in capitalization rate calculation (Kazdin, 1944). In a fundamental contribution on property market cycle, Born and Pyhrr (1994) expressed a hard judgement on traditional income approach techniques as: "... a constant overall capitalization rate to convert NOI (net operating income) into market value at the end of the projection period (generally ten years) and (3) a stabilized vacancy rate over the projection period. This is a static modelling that is incompatible with the dynamic market it seeks to measure..." (Born and Pyhrr, 1994, p. 456). This problem has been addressed also with the introduction of *g* factor and the explicit growth models in the application of direct capitalization. The meaning and the determination of *g* factor had several different approaches along the time. In finance, it represents the growth of the dividend of a company, whilst in real estate it may have several interpretations. A possible approach in determining the *g* factor is either identifying a long-run trend in the rental growth or forecasting future economic variables that may have causal relationship with property yields. Both approaches may be combined (Baum & Crosby, 2014). As seen in Eq. 18.1, a further determination to calculate the *g* factor is the product between the variation in rent and capital along the holding period per a sinking fund designed to return all the invested capital to the investor in a lump sum at the termination of the investment to replace the asset at the end of the holding period:

$$g = \Delta a = \Delta \frac{i}{(1+i)^n - 1} \tag{18.1}$$

Hoskold premise employs two separate interest rates: the former is a speculative rate representing a fair rate of return on capital commensurate with the risks involved, whilst the latter is a safe rate for a sinking fund previously defined. According to Inwood premise, *g* factor is a similar product, but both terms are calculated referring to the same discount rate (target rate of return) (Appraisal Institute, 2012). In the application of DCF analysis, the growth factor reflects the firm's or asset's ability to "increase cash flow as it compares to economywide movements in domestic prices..." (Pagliari & Webb, 1995, p. 1067; Asikoglu & Ercan, 1992). Nevertheless, the same term called *g* factor may have different meanings according to the use. The meanings can be related to the specific attitude of the asset to produce income flow or in another case to the variation of value along the economic life of the property. In both cases growth factor is calculated referring to the economic features of the asset. In cyclical capitalization techniques, the *g* factor assumes a different meaning. It is directly connected not only to the variation of the value and rent of the asset along its life but to the perspective changes in income and value in the specific market segment. This is the difference between the *g* factor as it is normally calculated and the application of cyclical capitalization. In this view it is possible to model also lag vacancy and a specific relationship between property market cycle and the temporal length of the lease contract (d'Amato &

Amoruso 2018; d'Amato et al., 2019a). In this respect, the final formula of cyclical capitalization is indicated in formula 18.2:

$$V = \frac{\mathrm{NOI}(1+Y)^n}{(1+Y)^n + 1}\left[\frac{1}{Y - \Delta a_{RR}} + \frac{1}{Y - \Delta a_{EC}}\,\frac{1}{(1+Y)^n}\right] \tag{18.2}$$

$$V = \frac{\mathrm{NOI}(1+Y)^n}{(1+Y)^n + 1}\left[\frac{1}{R_{RR}} + \frac{1}{R_{EC}}\,\frac{1}{(1+Y)^n}\right]$$

The mathematical underpinning of the cyclical capitalization in its basic form is indicated in Appendix 1. As one can see, the formula has two or more overall capitalization rates/all-risk yields and one (in the normal) or more target rates of return/discount rates. In this way the g factor includes in the valuation process not only the changes over the market of the asset as if it were outside a market context but also the cyclicality normally included in the property market. In the models indicated (d'Amato, 2015, 2017a, b; d'Amato & Amoruso 2018; d'Amato et al., 2019a, b; Renigier et al., 2018, 2019; Kaklauskas et al., 2012; Kauko & d'Amato, 2009), there is a recurring assumption indicated in formula 18.3:

$$i > g \tag{18.3}$$

In the following section, this assumption will be removed showing four different models. Two models of them may be applied in those market contexts in which the growth factor is greater than the target rate of return or discount rate.

Extended Cyclical Capitalization Models

The problem in the cyclical capitalization methodology is that previous modelling is always based on the assumption that the target rate of return (UK terminology) or discount rate (US terminology) should be greater than the g factor. This is an assumption that may not be applied in those cases in which the growth rate in the specific phase can be greater than the discount rate or target rate of return. Below it is possible to see the final formula of fourth extended models in which it is possible to observe that the growth rate may be greater than the discount rate/target rate of return. Mathematical demonstrations are available in Appendix 2 of this paper.

$$V = R\left[\frac{1 - \left(\frac{1+g_1}{1+i}\right)^n}{i - g_1}\,\frac{(1+i)^{2n}}{(1+i)^{2n} - 1} + \frac{1 - \left(\frac{1+g_2}{1+i}\right)^n}{i - g_2}\,\frac{(1+i)^n}{(1+i)^{2n} - 1}\right] \tag{18.4}$$

Table 18.1 Comparing 18.4 cyclical capitalization formula with the application of traditional dividend discount model using the growth factor of each property market phase

g_1	g_2	n	MAPE 1	MAPE 2
0.001	0.009	5	−0.01073	−0.15588
0.002	0.008		−0.02847	−0.13736
0.003	0.007		−0.04662	−0.11921
0.004	0.006		−0.06398	−0.10029
0.005	0.005		−0.08173	−0.08173
0.006	0.004		−0.0995	−0.06317
0.007	0.003		−0.11727	−0.04459
0.008	0.002		−0.13544	−0.02642
0.009	0.001		−0.15282	−0.0074

$$V = R\left[\frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_1 - i}\frac{(1+i)^{2n}}{(1+i)^{2n}-1} + \frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_2 - i}\frac{(1+i)^n}{(1+i)^{2n}-1}\right] \tag{18.5}$$

$$V = R\left[\frac{1 - \left(\frac{1+g_1}{1+i}\right)^n}{i - g_1}\frac{(1+i)^{2n}}{(1+i)^{2n}-1} + \frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_2 - i}\frac{(1+i)^n}{(1+i)^{2n}-1}\right] \tag{18.6}$$

$$V = \frac{(1+i)^n - 1}{i(1+i)n}\left[R_1\frac{(1+i)^{2n}}{(1+i)^{2n}-1} + R_2\frac{(1+i)^n}{(1+i)^{2n}-1}\right] \tag{18.7}$$

Referring to the fourth property valuation models, it is possible to apply cyclical capitalization when i is greater than g factor as in model A.8. But it is also possible to apply model A.12 when g is greater than i. Model A.16 gives the opportunity to the valuer to deal with an i greater than g in one property market phase and a g greater than i in another one. The final model may be useful in specific context with lower variation and a predictability of future rents' variations. In order to observe how these models work, it is possible to start with a simulation of the final results. Assuming a phase of the cycle equal to 5 years, Table 18.1 compares the final results obtained by the application of formula 18.4 with the result of direct capitalization based on the traditional Gordon and Shapiro model per phase assuming a discount rate (or target rate of return) varying from 0.01 to 0.2 and a growth factor varying from 0.001 to 0.01 (Born and Pyhrr, 1990).

In Table 18.1 both the first and the second columns indicate the g factor in the specific. In the third column, there is the temporal length of the phase, whilst in the final two columns, there are the mean absolute percentage error measuring the valuation variation among the cyclical capitalization (model A.8) and the two direct capitalization models based on the traditional model of Gordon and Shapiro (1956) using the g factor per phase. The application of cyclical capitalization leads to property value regularly lower than the one based on the application of traditional direct capitalization techniques. This is a confirmation of previous results (d'Amato, 2015, 2017) that showed a potential application of cyclical capitalization techniques for the determination of mortgage lending value. In Table 18.2, one may observe the

Table 18.2 Application of 18.5 cyclical capitalization formula. As the growth factor g is greater than the discount rate i, it is not possible a comparison with the traditional dividend discount rate technique

i	g_1	g_2	n	V
0.001	0.03	0.02	5	1051.292
0.002	0.035	0.025		530.9034
0.003	0.04	0.03		357.4682
0.004	0.045	0.035		270.7715
0.005	0.05	0.04		218.7701
0.006	0.055	0.045		184.1165
0.007	0.06	0.05		159.376
0.008	0.065	0.055		140.8312
0.009	0.07	0.06		126.4169
0.01	0.075	0.065		114.894
0.011	0.08	0.07		105.4739
0.012	0.085	0.075		97.63097
0.013	0.09	0.08		91.00129
0.014	0.095	0.085		85.32489
0.015	0.1	0.09		80.41112
0.016	0.105	0.095		76.11702
0.017	0.11	0.1		72.33325
0.018	0.115	0.105		68.97478
0.019	0.12	0.11		65.97446
0.02	0.125	0.115		63.27859

results of the application of model A.12 where the g factor is greater than the discount rate.

In Table 18.2 the first column indicates the discount rate, and the second and third columns show the different growth factors used in the valuation process; both of them are greater than the discount rate. The fourth column is the temporal length of the property market phase assumed 5 years, and finally the last column indicates the result obtained assuming a rent equal to 1. There is not valuation variation because the traditional model of Gordon and Shapiro cannot be applied when the discount rate is lower than the growth factor. The third formula 18.6 combines both cases. It is possible to observe a property market phase where the discount rate is greater than the growth factor and a different property market phase where the discount rate is lower than the growth factor. A first simulation is provided in Table 18.3.

In Table 18.3 the first column indicates the discount rate; the second column shows a growth factor used in the valuation process. The third column is the temporal length of the property market phase assumed 5 years. The fourth and fifth columns, respectively, show lower and higher discount rates for the second part of formula 18.6. Finally, the sixth column shows the final value. In this case the discount rate is lower than the growth factor in a property market phase; the contrary will occur in the following property market phase. Final results of Table 18.3 show how value is proportionally inverse to discount rate as in the traditional version of dividend discount model. The model provides a more prudent value in this case confirming the evidence of previous application of cyclical capitalization model

Table 18.3 Application of 18.6 cyclical capitalization formula

i	g_1	n	i	g_2	V
0.01	0.009	5	0.001	0.02	571.2481
0.02	0.009		0.002	0.025	288.1816
0.03	0.009		0.003	0.03	193.8263
0.04	0.009		0.004	0.035	146.6485
0.05	0.009		0.005	0.04	118.3414
0.06	0.009		0.006	0.045	99.46963
0.07	0.009		0.007	0.05	85.98926
0.08	0.009		0.008	0.055	75.87842
0.09	0.009		0.009	0.06	68.01385
0.1	0.009		0.01	0.065	61.72162
0.11	0.009		0.011	0.07	56.57285
0.12	0.009		0.012	0.075	52.28163
0.13	0.009		0.013	0.08	48.65003
0.14	0.009		0.014	0.085	45.53669
0.15	0.009		0.015	0.09	42.83793
0.16	0.009		0.016	0.095	40.47601
0.17	0.009		0.017	0.1	38.39147
0.18	0.009		0.018	0.105	36.53808
0.19	0.009		0.019	0.11	34.87934
0.2	0.009		0.02	0.115	33.38606

(d'Amato, 2015, 2017a, b). Finally, in Table 18.4 a simulation of formula 18.7 is provided. In this case, we have a cyclical capitalization technique working on the different rent values in different market phases.

In Table 18.4 the first column shows the variation of discount rate between 0.01 and 0.2. The second column offers the temporal length of the property market cycle, whilst the third and fourth columns indicate two different rents per phase. Finally the fifth column indicates the value, whilst the sixth and the seventh columns indicate the value derived from direct capitalization assuming the rent R1 in the downturn of the property market cycle and R2 in the upturn of the property market cycle. In this case it is possible to see how the final result is positioned in the middle of both results.

Final Remarks and Future Directions of Research

In this chapter four further cyclical capitalization models have been proposed belonging to the wider family of cyclical capitalization techniques. It is possible to observe in the simulation that the Gordon and Shapiro model in its original form seems to have procyclicality problems. As natural extension of the original dividend discount model, the further modelling of cyclical capitalization presented in this chapter seems to provide more prudent and flexible results. Therefore they may be

Table 18.4 Application of 18.7 cyclical capitalization formula based on different rents per property market phase

i	n	R_1	R_2	V	R_1/i	R_2/i
0.01	5	1	2	154.7966	100.00	200.00
0.02				79.84382	50.00	100.00
0.03				54.89176	33.33	66.67
0.04				42.44044	25.00	50.00
0.05				34.98988	20.00	40.00
0.06				30.04011	16.67	33.33
0.07				26.51973	14.29	28.57
0.08				23.89305	12.50	25.00
0.09				21.86248	11.11	22.22
0.1				20.24948	10.00	20.00
0.11				18.94043	9.09	18.18
0.12				17.8596	8.33	16.67
0.13				16.95456	7.69	15.38
0.14				16.18786	7.14	14.29
0.15				15.53206	6.67	13.33
0.16				14.96658	6.25	12.50
0.17				14.47566	5.88	11.76
0.18				14.04708	5.56	11.11
0.19				13.67117	5.26	10.53
0.2				13.3402	5.00	10.00

helpful to deal with the upturn and downturn of the property market cycle in a more flexible way. They may be helpful in dealing with specific context such as the so-called cyclical assets defined by the International Valuation Standards. Further analysis is required for understanding how these models may vary according to different length of market phase and different variation of several inputs.

Appendices

Appendix 1: Cyclical Capitalization Basis

In the application of the cyclical capitalization, the valuation of income-producing property is based on the division of the value in several slices of value. Each of this slice will have a different cap rate according to different real estate market phase. Therefore the valuer will not calculate anymore only one cap rate but several different cap rates according to different market phases. In formula A.1 it is indicated the value derived from the application of the model to a single phase negative (recession-recovery):

$$V_{\text{PhaseRR}} = \frac{\text{NOI}}{Y - (-\Delta a_{\text{RR}})} - \frac{\text{NOI}}{Y - (-\Delta a_{\text{RR}})} \frac{1}{(1+Y)^{\text{irr}}} \tag{A.1}$$

t_{RR} is the temporal length of a recovery-recession phase, whilst t_{EC} is the length of an expansion-contraction phase. Assuming an equal temporal length of the two phases, formula A.1 would be transformed in formula A.2:

$$\begin{aligned} V = & \frac{\text{NOI}}{Y - \Delta_{\text{RR}} a_{\text{RR}}} \left(1 - \frac{1}{(1+Y)^{2n}} + \frac{1}{(1+Y)^{4n}} - \frac{1}{(1+Y)^{6n}} \cdots \right) \\ & - \frac{\text{NOI}}{Y - \Delta_{\text{RR}} a_{\text{RR}}} \left(\frac{1}{(1+Y)^{n}} + \frac{1}{(1+Y)^{3n}} - \frac{1}{(1+Y)^{5n}} \cdots \right) \\ & + \frac{\text{NOI}}{Y - \Delta_{\text{EC}} a_{\text{EC}}} \left(\frac{1}{(1+Y)^{n}} + \frac{1}{(1+Y)^{3n}} - \frac{1}{(1+Y)^{5n}} \cdots \right) \\ & - \frac{\text{NOI}}{Y - \Delta_{\text{EC}} a_{\text{EC}}} \left(\frac{1}{(1+Y)^{2n}} + \frac{1}{(1+Y)^{4n}} - \frac{1}{(1+Y)^{6n}} \cdots \right) \end{aligned} \tag{A.2}$$

It is possible to define four infinitive geometric progressions of rate "−1/(1+Y)n" in formula A.2. As a consequence the final formula of this group of the cyclical capitalization modelling techniques is indicated in formula A.3:

$$V = \frac{\text{NOI}(1+Y)^{n}}{(1+Y)^{n} + 1} \left[\frac{1}{Y - \Delta a_{\text{RR}}} + \frac{1}{Y - \Delta a_{\text{EC}}} \frac{1}{(1+Y)^{n}} \right] \tag{A.3}$$

In formula A.3 there are two different growth factors (UK standards) or Δa terms (US standards) for each of the two real estate market phases. The same approach can be applied using formula 18.1. In this case instead of using two different g factors (Δa terms), it is possible to use two different overall capitalization rates one per market phase. The final formula A.4 is indicated below:

$$V = \frac{\text{NOI}(1+Y)^{n}}{(1+Y)^{n} + 1} \left[\frac{1}{R_{\text{RR}}} + \frac{1}{R_{\text{EC}}} \frac{1}{(1+Y)^{n}} \right] \tag{A.4}$$

Appendix 2: Extended Models of Cyclical Capitalization

This appendix provides the methodological basis of the three further models belonging to the family of cyclical capitalization techniques.

1. A *first development* is based on the value of limited growing rents where i > g:

$$V = R\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1} + R\frac{1-\left(\frac{1+g_2}{1+i}\right)^n}{i-g_2}\frac{1}{(1+i)^n} + R\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}\frac{1}{(1+i)^{2n}} + R\frac{1-\left(\frac{1+g_2}{1+i}\right)^n}{i-g_2}\frac{1}{(1+i)^{3n}}\ldots \tag{A.5}$$

$$V = R\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}\left[1+\frac{1}{(1+i)^{2n}}+\frac{1}{(1+i)^{4n}}+\ldots\right] + R\frac{1-\left(\frac{1+g_2}{1+i}\right)^n}{i-g_2} \times \left[\frac{1}{(1+i)^n}+\frac{1}{(1+i)^{3n}}+\ldots\right]\ldots \tag{A.6}$$

In this case we have two decreasing geometric progressions. In the table below, it is possible to observe the first term a and the rate of progression q in both the decreasing progressions.

1.1	First Progression		Second Progression	
	a	1	a	$1/(1+i)^n$
	q	$1/(1+i)^{2n}$	q	$1/(1+i)^{2n}$

As a consequence it is possible to write:

$$V = R\left[\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}1\left[\frac{1}{1-\frac{1}{(1+i)^{2n}}}\right] + \frac{1-\left(\frac{1+g_2}{1+i}\right)^n}{i-g_2}\frac{1}{(1+i)^n}\left[\frac{1}{1-\frac{1}{(1+i)^{2n}}}\right]\right] \tag{A.7}$$

Therefore finally:

$$V = R\left[\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}\frac{(1+i)^{2n}}{(1+i)^{2n}-1} + \frac{1-\left(\frac{1+g_2}{1+i}\right)^n}{i-g_2}\frac{(1+i)^n}{(1+i)^{2n}-1}\right] \tag{A.8}$$

2. A *second development* is based on the value of limited growing rents where i < g:

$$V = R\frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_1 - i} + R\frac{\left(\frac{1+g_2}{1+i}\right)^n - 1}{g_2 - i}\frac{1}{(1+i)^n} + R\frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_1 - i}\frac{1}{(1+i)^{2n}} + R\frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_2 - i}\frac{1}{(1+i)^{3n}}\ldots \tag{A.9}$$

$$V = R\frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_1 - i}\left[1 + \frac{1}{(1+i)^{2n}} + \frac{1}{(1+i)^{4n}} + \ldots\right] + \bar{R}\frac{\left(\frac{1+g_2}{1+i}\right)^n - 1}{g_2 - i} \times \left[\frac{1}{(1+i)^n} + \frac{1}{(1+i)^{3n}} + \ldots\right] \tag{A.10}$$

In this case we have two decreasing geometric progressions, too. In the table below, it is possible to observe the first term a and the rate of progression q in both the decreasing progressions.

1.2	First Progression		Second Progression	
	a	1	a	$1/(1+i)^n$
	q	$1/(1+i)^{2n}$	q	$1/(1+i)^{2n}$

As a consequence it is possible to write:

$$V = \bar{R}\left[\frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_1 - i}1\left[\frac{1}{1 - \frac{1}{(1+i)^{2n}}}\right] + \frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_2 - i}\frac{1}{(1+i)^n}\left[\frac{1}{1 - \frac{1}{(1+i)^{2n}}}\right]\right] \tag{A.11}$$

Therefore finally:

$$V = R\left[\frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_1 - i}\frac{(1+i)^{2n}}{(1+i)^{2n} - 1} + \frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_2 - i}\frac{(1+i)^n}{(1+i)^{2n} - 1}\right] \tag{A.12}$$

3. A *third development* is the combination of both previous models. In a property market phase, $i>g$, and in the following property market phase, $i<g$. This way cyclical capitalization shows its maximum flexibility and adaptation to market reality.

$$V = R\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1} + R\frac{\left(\frac{1+g_2}{1+i}\right)^n - 1}{g_2 - i}\frac{1}{(1+i)^n} + R\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}\frac{1}{(1+i)^{2n}} + R\frac{\left(\frac{1+g_2}{1+i}\right)^n - 1}{g_2 - i}\frac{1}{(1+i)^{3n}}\ldots \tag{A.13}$$

$$V = R\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}\left[1 + \frac{1}{(1+i)^{2n}} + \frac{1}{(1+i)^{4n}} + \ldots\right] + R\frac{\left(\frac{1+g_2}{1+i}\right)^n - 1}{g_2 - i} \times \left[\frac{1}{(1+i)^n} + \frac{1}{(1+i)^{3n}} + \ldots\right] \tag{A.14}$$

In this case we have two decreasing geometric progressions, too. In the table below, it is possible to observe the first term a and the rate of progression q in both the decreasing progressions.

1.3	First Progression		Second Progression	
	a	1	a	$1/(1+i)^n$
	q	$1/(1+i)^{2n}$	q	$1/(1+i)^{2n}$

As a consequence it is possible to write:

$$V = R\left[\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}1\left[\frac{1}{1-\frac{1}{(1+i)^{2n}}}\right] + \frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_2 - i}\frac{1}{(1+i)^n}\left[\frac{1}{1-\frac{1}{(1+i)^{2n}}}\right]\right] \tag{A.15}$$

Therefore finally:

$$V = R\left[\frac{1-\left(\frac{1+g_1}{1+i}\right)^n}{i-g_1}\frac{(1+i)^{2n}}{(1+i)^{2n}-1} + \frac{\left(\frac{1+g_1}{1+i}\right)^n - 1}{g_2 - i}\frac{(1+i)^n}{(1+i)^{2n}-1}\right] \tag{A.16}$$

4. A further model (fourth) uses constant rents one per single property market phase:

$$V = R_1 \frac{(1+i)^n - 1}{i(1+i)n} + R_2 \frac{(1+i)^n - 1}{i(1+i)n} \frac{1}{(1+i)^n} + R_1 \frac{(1+i)^n - 1}{i(1+i)n} \frac{1}{(1+i)^{2n}} + R_2 \frac{(1+i)^n - 1}{i(1+i)n} \frac{1}{(1+i)^{3n}} \ldots \quad \text{(A.17)}$$

$$V = R_1 \frac{(1+i)^n - 1}{i(1+i)n} \left[1 + \frac{1}{(1+i)^{2n}} + \frac{1}{(1+i)^{4n}} + \ldots \right] + R_2 \frac{(1+i)^n - 1}{i(1+i)n} \times \left[\frac{1}{(1+i)^n} + \frac{1}{(1+i)^{3n}} + \ldots \right] \quad \text{(A.18)}$$

In this case we have two decreasing geometric progressions, too. In the table below, it is possible to observe the first term a and the rate of progression q in both the decreasing progressions.

1.3	First Progression		Second Progression	
	a	1	a	$1/(1+i)^n$
	q	$1/(1+i)^{2n}$	q	$1/(1+i)^{2n}$

As a consequence it is possible to write:

$$V = R_1 \frac{(1+i)^n - 1}{i(1+i)n} 1 \left[\frac{1}{1 - \frac{1}{(1+i)^{2n}}} \right] + R_2 \frac{(1+i)^n - 1}{i(1+i)n} \frac{1}{(1+i)^n} \times \left[\frac{1}{1 - \frac{1}{(1+i)^{2n}}} \right] \quad \text{(A.19)}$$

Therefore finally:

$$V = \frac{(1+i)^n - 1}{i(1+i)n} \left[R_1 \frac{(1+i)^{2n}}{(1+i)^{2n} - 1} + R_2 \frac{(1+i)^n}{(1+i)^{2n} - 1} \right] \quad \text{(A.20)}$$

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Part III
Conclusion

Chapter 19
Property Market Cycle and Valuation. . .Filling the Gap



Maurizio d'Amato and Yener Coskun

Those who have no memory of their Past are Condemned to relive it

Primo Levi

Abstract This is a conclusive contribution in which the reader will focus on the most important question raised in the book. It is stressed that although bubbles occur in the real estate market the gap between property market analysis valuation procedure and automated valuation methods still remains. The book requires more efforts in the integration between urban economics and property valuation in this domain.

Keywords Property market cycle · Valuation

In the chapters of this book has been provided an analysis of the dimension of the problem of market cycle in the valuation of market value, assessment of worth or investment value, and automated valuation models. Several possible solutions have been proposed that involved even a different approach to well-known basis of value such as mortgage lending value. The integration between real estate and financial market had consequence even in property valuation methodologies. The merit of this book probably is turning on the lights on an actual gap between professional valuation and advisory and the influence of property market cycle. The contribution is organized as follows: in the next paragraph, we expose a synthesis of the principal content of the book. In the following paragraph, some questions will be raised in order to favor a debate. The final paragraph will offer some conclusions indicating future directions of research.

Authors Maurizio d'Amato and Yener Coskun have equally contributed to this chapter.

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What We Learned

This book was an opportunity to discuss the problem of the integration between property valuation and property market cycle analysis. The authors never met in person but worked with us as editors to provide points for discussion. An integration between market cycle analysis and valuation process inside an institutional context may help to handle market fluctuations like highlighted in Kauko's Chap. 3. The role of the International Financial Standards in property market cyclicality has been discussed in Parker's Chap. 4. The Chap. 5 of d'Amato and Renigier stressed the relationship between property cyclicality and the inputs of income approach in property valuation process. In their Chap. 6, Paloma Taltavull de la Paz and Francisco Juàrez Tàrraga demonstrated how appraisal process tends to overvalue or undervalue property near the extreme of the real estate cycles. This is due to the fact that traditional methodologies do not include an analytical structure identifying cyclicality. In the following chapter, d'Amato et al. (2019a, b) and d'Amato (2015, 2017a, b) proposed a methodological redefinition of mortgage lending value based on cyclical capitalization as "normal" and "strong" forms in order to deal with property market cycle. The problem of cyclicality is also connected by Esra Alp Coskun to heuristics and appraisal biases. In this view, it is worth to notice the link between opinion of value provided by valuers and previous valuation (anchoring) determined by the appraisal smoothing. In such a market, the impact of procyclical valuation as the method of direct capitalization is amplified. The relationship between property valuation standards and property market cycle has been confirmed also in a specific experience of Estonia in the contribution of Saakh. In his Chap. 11, Grover analyzed the relationship between crisis and regulatory responses underlining the strict linkage between real estate and financial sector. In this view, valuers and advisors should make the difference providing professional valuation and assessment of worth. The relationship between property valuation and property market cycle is the focus of this chapter by d'Amato and Coskun dealing with how the cyclicality affects income approach. In the following Chap. 13, d'Amato offers several methodological tools based on a mathematical approach as a further method to appraise and manage income-producing properties. The integration proposed allowing the appraiser to use trigonometric formulas in order to deal with a flexible way with the property market cycle. Michaletz and Artemenkov's Chap. 14 offers a unique extension of the transactional asset pricing approach models verifying the impact of property market cycle on it. The model is a demonstration of how to integrate property market cycle into the traditional financial modelling and whether an innovative version of the model is possible. D'Amato, Salman and Sirleo proposed an analysis in the application of cyclical capitalization in order to observe the sensitiveness of the opinion of value to the variability of the rent. The result is not sensitive to rent variation. Herath and Maier discussed the strategies that have been implemented within hedonic price method to incorporate the impact of the business cycle into house price models. The relation between property valuation and property market cycle may be not neutral as stated in the dominant conceptual framework.

Therefore, property valuation may influence the property market cycle as clarified in Mooya's Chap. 17. In his final Chap. 18, d'Amato provides four "extended" models of cyclical capitalization. In general terms both the first and the second parts represent a starting point to propose a reflection on the role of the market cycle not only as a well-accepted field of study in the Urban Economics but also as a possible tool for the daily work of valuers and advisors.

What We Need to Learn

In the Age of Information (Foster et al., 2017), an increasing number of data and information are available. We are assisting to a meaningful increase of computational capability of our computers. It is possible to store more quantity of information than in the past, and massive computational problems can be solved in few minutes. Software performs complex econometric analysis in few steps often producing good inference (Winson-Geideman et al., 2018). Finally, there is a growing availability of data, "big data." One of the definitions of big data pertinent in our case is "too big, too fast or too hard for existing tools to process" (Madden, 2012). Indeed, this is particularly true for the relation between real estate information and real estate valuation. In the past on Internet, it was possible to observe an real estate advertising; now there is a growth of real estate information in terms not only of quantity but also of quality. Trends and reports are exposed offered for further analyses. Valuers today deal with time series of prices and rents and even yield rate time series provided in the market by the most important real estate advisory companies. Although the increase of information, our valuation tools rely on the procedure mainly based on a methodological framework that seems indifferent to the described revolutionary change. The methodological foundations of discounted cash flow analysis, the direct capitalization, as well as the yield capitalization is always the same. Therefore some questions can be raised: How did this increase of real estate information, although nonuniform all over the markets and submarkets, change property valuation? Can an increase of information in quality and quantity improve the reliability of the valuation? The answer is probably yes. There are several unanswered questions that we need to deal with. The first one is*: Can the valuation be a tool to fight real estate market bubble?* After the global financial crisis, we understand the importance of the role of the valuers and the valuation procedure for the stability of the entire economic system among the other causes (Aalbers, 2009; Neuhauser, 2015). It is also clear the importance of the banking, securities, and insurance regulations on the property market cycle. Probably we need to understand how it is possible to improve the valuation methodologies in order to take into account property market cycle. The definition of comparable seems too static to develop a proper answer to the continuous and cyclical change of real estate market. This dynamic reshaping also implies that we need to improve market income and cost approach to provide cyclical models able to give a temporal perspective to the valuation carried out. The same issue may be referred to AVM models. A second question can be *what is a*

comparable? In other terms, comparables are data that give us an information in a specific moment. Normally a comparable is a price or a rent occurring in a specific market segment. It is a screenshot of a social phenomenon varying along the time. Probably, we need to enforce this concept integrating it with observation of market trends that are more and more available in the "age of information." Although the common sense of a comparable is related to a property transaction, the definition of market value states that the parts should act "knowledgeably, prudently and without compulsion" (IVS, 2020, IVS 104, para 30.1). The definition of knowledgeably varies along the time according to the nature and the quality of information available. In the same definition of market value, the time trend is explicitly quoted. In fact, it is possible to read "for example, it is not necessarily imprudent for a seller to sell assets in a market with falling prices at a price that is lower than previous market levels. In such cases, as is true for other exchanges in markets with changing prices, the prudent buyer or seller will act in accordance with the best market information available at the time" (IVS, 2020, IVS 104 para 30.2 letter h). It seems evident that in the International Valuation Standards, a transaction price is not enough and a knowledgeable behavior relies also on the knowledge of property market phase. Therefore, besides still emerging theoretical/empirical literature on cyclical valuation, there is another missing piece in the practical side: the lack of sophisticated cyclical valuation modelling approaches in the International Valuation Standards. This book underlines the possible practical results of this problem. Probably, the methodological contributions provided in this book may help in many ways the valuer to include this "cyclical knowledge" in the determination of an opinion of value. This introduces the reader to the third question opened by the authors on the role of valuation: *Is it possible to believe in a neutral role of the valuation models inside the economic system?* According to the different perspectives explored in this book, the answer is no. Valuation has a positive role such as a determination of an opinion of value for a specific moment of the market. This specific role has important influences on economic system because of the growing integration between real estate and financial markets. An indirect confirmation was available in a "confession of a subprime lender" (Bitner, 2008) describing how the valuation activity was skimmed for approving non-agency mortgage loans. Therefore, property valuation matters, indeed. If this is true another question is: *Can the valuation of an income producing properties relies on the assumption of a stable or ever growing rent*? Although it has been stressed how traditional methods are procyclical (DeLisle & Grissom, 2011), after the bubble valuations, restart as usual. It seems that when the music plays and dance goes on, real estate market players also prefer to forget the lessons of past failures. This book shows different approaches that may help even in defining basis of value in a different way. A further question beyond the valuation process is *How to address downturn and upturn of the market in AVM modelling.* In this domain, the book provides some methodological solutions that may improve AVM modelling. At the moment spatiotemporal modelling seems to be a promising direction (Case et al., 2004). The questions raised may provoke further studies, books, articles, and discussions, in the common attempt to explore the unknown.

Future Directions of Research

At the end of the book, the contents exposed gave the reader several future directions of research. Possible challenges will be either in the application of direct capitalization or in the calculation of scrap value in the discounted cash flow analysis. It seems evident that alternative methods to income approaches normally based either on a stable income or an ever-growing rent are possible. These alternatives can be considered particularly important after the global financial crisis for the stability of the economic system. Our current methodologies especially income approach seem less sensitive to what happens in the specific property market segment and in market trends. In the book, several solutions with some methodological extensions have been exposed. They cannot be considered as the final answer. Instead, they can be considered as the beginning of a path looking for a closer integration between urban economics and property valuation under the effects of cyclical behaviors of the real estate market. It may be useful to reflect on the delicate role played by valuation in the economic system which cannot be defined neutral. Exploring this relationship may be useful and probably is an obligation to guarantee a stable growth for future generation. This effort may start from research and may be included progressively in the standards. Information on real estate market is growing both in quality and quantity, but this progress seems not to have a consequence in the methodologies of valuation we use in our everyday task as valuer. Probably, we need to increase our effort to provide reliable valuation having the courage to try different and alternative paths. A reliable and a complete valuation process may allow regulatory agencies to deliver their job in a more efficient way. The alternative is leaving the things as they are, waiting for the next destructive global financial crisis.

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