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Economic scenarios for the real estate market: Incorporating uncertainty and risk in real estate appraisals

Real estate appraisal is usually regarded as both a science and an art: “science” because the appraiser uses mathematical calculations and other *objective* elements, “art” because he also uses his experience and other *subjective* elements. This dual character requires—among others—that new insights from other disciplines and current trends are taken into account. The central proposition of the article is that this requirement is not met. The author provides evidence that real estate risk management has made tremendous progress since the mid-1990s which has not found its way into appraisal practice, thereby creating a situation where appraisals by risk analysts differ greatly from appraisals by real estate appraisers. According to the author the gap between real estate appraisal and risk analysis should be closed from both sides.

The article begins with an overview of the most important trends which will impact real estate values in the future. From these trends, an exemplary economic scenario for European real estate markets is derived in order to demonstrate that scenario writing is a powerful tool for risk management. After that the author discusses some other methods of risk management and their potential benefits for real estate appraisal.

Key words: *risk management, real estate appraisal, megatrend*

1. Introduction

In an article titled “Real Estate Appraisals: Recommendations to Reduce Risk” the authors, Peter Larr and Andrew Riebe, write about a real estate crisis:

“How could so many experts—developers, insurance companies, consultants, brokers, appraisers, bankers, regulators, and economists—have missed the signs of a downturn of such destructive magnitude? [...] Many observers say that the troubles experienced by banks in real estate stem from poor underwriting or from overleveraging the properties. These observations say nothing more than that the banks failed to assess accurately the value of the collateral” (Larr and Riebe, 1995, p. 24-26).

That seems to be an incisive description of what caused the subprime lending crisis in the US in 2009 and eventually the current world financial crisis. But it is not. The article was written in 1995! But it could have been written in 2009. Or after almost any other real estate crisis in the past because the boom-bust-pattern of lending on overvalued properties in an upward market and incurring huge losses after the bursting of the bubble has happened in many places and many times before. What can we do to break out of that pattern? That is the question which Larr and Riebe tried to answer in their article and which I try to answer again, but with new insights 17 years later. The overlaps in our answers indicate that some things have not changed much and that risk is still not adequately incorporated in real estate appraisals.

On the other hand the advances in the field of real estate risk theory and risk management were not able to prevent the crises either. We have to acknowledge today that real estate risk is far too complicated to measure it with a single figure or to leave its management to machines. Instead, it is necessary to incorporate subjective elements like experience and judgments in real estate risk analysis.

These are the two hypothesis of my article which is structured as follows. In chapter 2 some important real estate market trends are compiled. From these trends I derive one exemplary economic scenario. Furthermore the chapter contains general considerations about uncertainty and risk of forecasts and appraisals. In chapter 3 I give an overview of the state of real estate risk research based on an extensive literature survey and my practical experience; in particular, I will discuss the methods risk analysts employ to assess property values, for instance scenario analysis and Monte Carlo simulation. Subsequently, proposals are made, how such methods can be used for real estate appraisals. Chapter 4 contains a summary and a reconciliation of the arguments of appraisers and risk analysts.

2. Trends and scenarios for European real estate markets

2.1 Megatrends that influence real estate markets in Europe

The term “megatrend” was coined by John Naisbitt for social, economic, political, and technological changes in the society which have a great and long-lasting impact on our lives (cf. Naisbitt 1982). Of course it is impossible to identify them a priori with certainty because of the uncertainty of forecasting, especially of such complex and far-reaching issues. Furthermore, to differentiate between megatrends and other trends requires judgment and a frame of reference: a trend may be considered a megatrend in one industry or in one country, but in a wider context it may not seem powerful enough to make it on the list of true megatrends. This being said, I regard such developments as “real estate megatrends” which...

- are exerting measurable influence on the real estate markets already today;
- have very high future likelihood and impact based on established forecasting methods; and
- will affect several European market sectors and regions in similar ways.

The following trends meet these criteria:

1. Demographics. The socio-demographic changes are probably the most important megatrend for real estate because in the end the number of people in a society as well as their age distribution and lifestyle preferences determine how much space is needed for which purposes. This is obvious for the housing sector, but it is also valid for office, retail, industrial and other sectors of the market, which are more affected by changes of the workforce. Furthermore it is the clearest megatrend since the underlying factors such as the fertility and mortality show a low volatility, cannot be influenced easily, take decades until their full effect and, thus, are comparatively easy to predict.

Figure 1. Megatrends

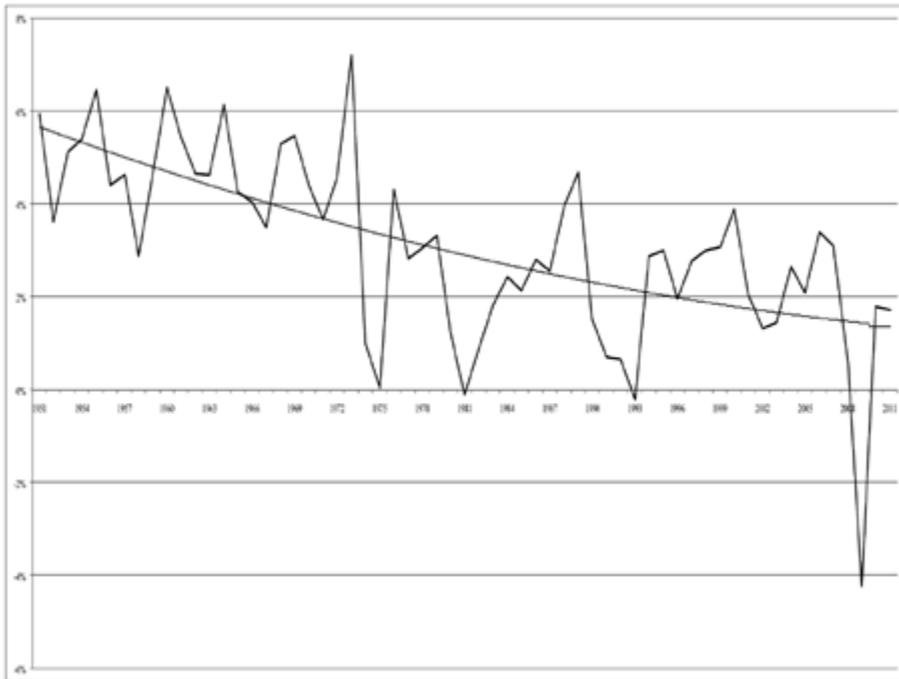
Seven European Real Estate Megatrends	
1. Demographics:	From rather stable populations to unknown conditions
2. Economy:	From economic growth to “Limits to Growth” ... and beyond
3. Ecology:	From a side condition to an equal driving force
4. Public finances:	From a rather wealthy to a needy public sector
5. Society:	From social peace to distribution conflicts in a complex society
6. Urbanization:	From an urban society to a suburban society ... and back?
7. Technology:	From traditional houses to intelligent buildings for individual needs

According to the latest estimation of the United Nations (UN 2011), the strong population growth will continue on all continents except for Europe. Here, the picture is diverse (cf., Eurostat 2008): due to different birth rates and immigration policies the population of Germany, Poland and several other countries is shrinking, the population of the UK, Sweden and others is growing. One result will be that Great Britain is predicted to overtake Germany as Europe’s most populated country by 2050. More importantly, most societies are aging rapidly. “The share of people aged 65 years or over in the total population is projected to increase from 17.1% to 30.0% [...], the old age dependency ratio is expected to increase substantially from its current levels of 25.4% to 53.5% in 2060” (Eurostat 2008, p. 1). So far we have only vague ideas about how life will be then, but it is clear that these developments will have grave consequences for markets, spatial structures in cities, segregation patterns, dwelling types, and many other aspects of real estate (cf. Helmholtz Centre for Environmental Research 2008; Balkenende 2008; ULI 2009; Burkardt and Schrader 2010).

2. Economy. From the end of the Second World War into the 1970’s Europe’s economy grew between 2.9% to 7.2% annually (see figure 2). And until the report “Limits to Growth” by the Club of Rome (Meadows et al. 1972) and the oil crisis in 1974 hardly anyone doubted that growth is good. But both have changed—at the latest since the financial crisis of 2009. For the future only modest growth rates are expected for Europe in total. It is expected that by 2020 the seven largest emerging economies (China, India, Brazil, Mexico, Russia, Indonesia, and Turkey) will possess greater economic power than the current G7 countries and that China will exhibit the highest GDP worldwide (PWC 2011).

The changing world order entails both opportunities and threats for the real estate industry in Europe. “On the one hand, competition from emerging market multinationals will increase steadily over time and the latter will move up the value chain” (PWC 2011, p. 3). On the other hand the hunger of the ascending countries for luxury and other goods, professional services, and better living quality offers new export opportunities for many real estate enterprises, for example architects, building contractors, investors, facility management service providers, consultants, and banks. Therefore the prospects for the real estate industry are not bad at all to partake in the growth on other continents. But there are good opportunities also on or adjacent to our continent: Poland, Russia and Turkey, for

Figure 2. Yearly change in total GDP and trend in the EU27 countries.



Source: The Conference Board Total Economy Database™, September 2011, <http://www.conference-board.org/data/economydatabase/>; computation by the author.

instance, belong to the driving forces of the world economy. And even in the saturated countries in Western Europe there is still some potential, for example in nursing homes and services for the elderly.

3. Ecology. For a long time ecological aspects were subordinated to the economic aspects. The serious environmental damages, the rise of the environmental movement in the 1970's and the climate change altered that. Nowadays laws like the European Energy Performance of Buildings Directive, but also economic reasoning—as a consequence of rising energy and other costs—force us to consider the ecology in all decisions concerning real estate.

In a recent study Jones Lang LaSalle (2010) compiled several implications for the real estate industry:

- physical threats (e.g., structural damage to buildings and their equipment through flooding);
- financial threats (e.g., business disruptions as a direct consequence of damaged buildings);
- regulatory threats (e.g., new laws aiming at reducing greenhouse gas emissions);
- market demand threats (e.g., for buildings which do not meet current energy efficiency standards);

- opportunities (e.g., rising demand for new products/services such as “green” real estate funds).

These threats and opportunities are so real and at the same time so far-reaching that it is obviously a must to include ecological aspects in all kinds of real estate analyses.

4. Public finances. In the past the prosperity of the European people rose more or less in line with the economy, no matter whether prosperity is measured by means of the GDP, the Human Development Index of the UN or another indicator. As a consequence the public expenditure ratio also rose in many countries, giving the citizens better education systems, infrastructure, welfare ... and more public servants. Often this resulted in higher public debt. The world financial crisis may have stopped all this because it has turned into a public debt crisis, which in the opinion of most experts can only be solved by radically reducing public spending. This will also hit the real estate economy, for example via the cancellation of subsidies for home owners or cutting down on public construction projects. Furthermore real estate will not be spared in the governments’ desperate search for new revenue sources. “Properties cannot run away”, and so it seems quite likely that taxes will rise in many countries—especially in those countries with comparatively low property taxes.¹

5. Society. With the rising prosperity social riots in the countries of the European Union became rare. This does not mean that the social problems were solved. On the contrary: in many cases they were only covered and threaten to break open now in view of rising unemployment, wage reductions, social security cuts, price increases, fear of hyperinflation, or child and old-age poverty. In countries such as Greece, Spain, and Great Britain the standard of living is already sinking. In such a situation the accumulated conflicts such as the lack of prospects for the young, ethnic tensions or segregation of certain classes of the population can easily unleash violent actions. This happened for example in England in the summer of 2011. Of course news about the rising inequality in our societies or about subsidies for distressed banks do nothing to ease the tensions.² But they make clear that the fights are to a large part conflicts about the little that the government can still distribute—and this will not become more anytime soon.

In addition many European countries are in the process of grave societal changes. Typical attributes of postmodern societies are “individualistic”, “infor-

¹ The revenue statistics of the OECD (2011a) reveal that taxes on property as percentage of GDP ranges from 0.3% in Estonia to 4.2% in the UK. Countries like Austria (0.6%), Hungary (0.8%), or Germany (0.9%) are significantly below the average of 1.8%.

² There is a consensus among researchers that wealth and income inequality has risen over the last decades in most European countries. However, the opinions diverge on whether this trend will continue. For an overview of the current state of the discussion see, for instance, OECD (2011b), Berger et al. (2010), and the September 2011 issue of *Finance & Development*, a quarterly publication of the International Monetary Fund.

mation“, or “mobile“.³ Properties reflect these changes, and the consequences for the real estate industry are immense. Individualization, for example, entails a rising number of small households and, *ceteris paribus*, a higher demand for small apartments. However, forecasting the demand is not that simple since individualization also entails very different conceptions of life and work. Not every small apartment is suitable for every small household; the needs of occupants are far more complicated—that is a lesson which the real estate industry must learn.

In summary I regard it as a megatrend that social inequality, public deficits and value change will make for unstable social conditions for many years to come. This makes forecasts more difficult, in particular concerning the demand side of the real estate markets.

6. Urbanization. Undoubtedly we are living in an urban world, and according to the UN (2010) urbanization will continue in most parts of Europe for many years to come. But more interesting is how the distribution of the urban population between different kinds of urban places (e.g., small city-intermediate city-million city, hinterland-suburb-core) will change in the future as this will greatly affect the real estate markets. Unfortunately we do not yet fully understand the processes taking place in urbanization. For a long time it was assumed that cities undergo a cycle with the stages urbanization, suburbanization, disurbanization and reurbanization. However, the overall empirical evidence for this model is not convincing, and it seems that it does not sufficiently reflect the dynamics of urbanization in Europe (Kabisch and Haase 2011). Instead, urban development seems to be “a mosaic of growth and decline, representing the outcome of the success and failure of separate spatial groupings of people to adjust to the opportunities and weaknesses inherent in their various circumstances,” as Paddison (2001, p. 159) stated. This would mean that sociology rather than economics or demographics is the key to understand and forecast the urbanization processes. Implications for urban planners, project developers and other real estate market participants with a long-term perspective are—among others—higher uncertainty, shorter development cycles and increased emphasis on societal changes in market and location analysis.

7. Technology. The automation trend and the ecological megatrend have been the main drivers of the progress in building technologies in recent years. It is quite likely that this will continue, due to the fact that (a) so far a significant degree of building automation is reached only in prime commercial buildings and in the homes of technology buffs and (b) in all European countries buildings are responsible for a very large part of the national energy consumption and greenhouse gas emission. The result will be that by 2030 *many of us* will work and live in highly automated, so-called “intelligent”, and energy efficient buildings with...

- instrumentation and control technology for physical security (e.g., video surveillance), life security (e.g., fire alarm), facilities management (e.g., lighting management), and work & entertainment (e.g., multimedia network);

³ For an overview see, for example, Inglehart/Welzel (2005); Kumar (2005); ESS.

- insulated exterior walls and windows;
- artificial ventilation and sun protection;
- usage of renewable energy sources;
- a variety of services attached.⁴

But by 2030 *most of us* will probably work and live in buildings that already exist today—because this corresponds to their basic needs, lifestyle, tradition, or means. This again reflects the tendency towards higher uncertainty and greater differentiation in real estate. We are moving away from common standards and “living will become as individual as the humans already are” (Burkardt and Schrader 2010, p. 12). In this context the technology is an important, but by no means the most important factor for the future development of real estate values.

Interesting evidence for this thesis comes from Canada, where Perks and Haan (2010) explored the housing decisions of older citizens. They found out that the elderly chose their dwellings mainly on the basis of their social needs, rather than on property or health care characteristics.

2.2 *Uncertainty and risk*

How does the knowledge about megatrends relate to real estate appraisals? The missing link lies in the definition of uncertainty and risk. Usually risk is defined as uncertainty about future events if probabilities can be estimated. According to Larsen (2006) “megatrends say something about the probable future, but there are other possible futures”. Firstly, nobody can predict the changes which the trends will bring about in every detail. Secondly, it is especially difficult to estimate the interrelations of the trends and the human capability of adapting to new situations. Thirdly, we cannot predict “black swans”, i.e., highly improbable events with extreme consequences that can stop or alter megatrends.⁵ Hence, megatrends are certainties, but they always contain elements of uncertainty.

The same can be said about appraisals. The famous Mallinson Report, for example, states that “all valuations are estimates and carry with them a degree of uncertainty” (RICS 1994, p. 9). As a consequence the valuer is responsible for dealing with uncertainty in a professional manner, e.g., to express the level of uncertainty in his report. The most basic way is to include verbal descriptions of uncertain aspects; other possibilities include instruments such as scorings (see Lorenz et

⁴ Representative for the countless studies about the building of the future, I cite Burkardt and Schrader (2010), who summarize a broad study commissioned by an association of German housing companies, and Wang (2010), who summarizes the current state of the art in building automation.

⁵ The term *black swan event* was popularized by Taleb (2007) and is increasingly used in the risk literature for incidents such as the late-2000s financial crisis or the events of September 11th 2001, which share the three principal characteristics rarity, extreme impact, and retrospective (though not prospective) predictability.

al. 2006 for an overview of the relevant literature). Yet another way is to estimate the probabilities of various outcomes affecting the property value. In contrast to the real estate appraisal literature this probabilistic approach dominates in the real estate risk literature today. Accordingly I differentiate between *risk* and *uncertainty* in the remainder of this paper.

2.3 Economic scenarios

How can the knowledge about megatrends be transformed into a useable format for real estate appraisals? One method which is widely used in both risk management and future studies is scenario writing. A scenario is a coherent story about how the future may unfold. According to Schnaars (1987, p. 106), “scenario analysis differs from most other approaches to forecasting in two important ways. First, it usually provides a more qualitative and contextual description of how the present will evolve into the future, rather than one that seeks numerical precision. Second, scenario analysis usually tries to identify a set of possible futures, each of whose occurrence is plausible, but not assured.” By making uncertainty explicit, discussion and creative thinking are facilitated so that the readers can use the technique for their purposes. To achieve this goal, scenarios should be based on an analysis of the past and the current drivers of developments (which is basically how I derived the megatrends in section 2.1), images of the future and ideas about possible development paths. If these requirements are met, it is of lesser importance which methods are employed, whether the likelihood of the different scenarios is assessed or how many scenarios are written.

To illustrate the usage of the scenario technique I created one scenario from the megatrends. For no particular reason I chose London, the housing market, the year 2032, and a pessimistic scenario.

In the year 2032...

- Greater London has a population of 8.8 million. It has increased by 12% in the last 20 years. The number of households has increased by 18%.
- Europe’s economies have never fully recovered from the world financial crisis. The average growth rates are below 1% p.a. The increasing deficit required extreme cuts on public spending. Tent cities and slums like in the USA after the crisis in 2009 are one result.
- Despite great investments in sustainable buildings the climate change has major obvious effects. The level of the North Sea has risen dramatically; it is projected to flood major parts of London’s Eastern suburbs within the next 20 years.
- Great Britain’s society is characterized by various social problems, e.g., old-age poverty and an ever-growing gap between the rich and the poor.
- People who can afford it flee the city and live outside, some of them in new dwelling types, for instance on artificial islands.
- Those that stay in the city prefer small but smart apartments with high efficiency and the latest technology. Buildings from before the “sustainable buildings hype” of the 2020s have dramatically lost in value.

Now consider the example of a spacious upscale flat in London with the following characteristics:

- located on the 3rd floor (no elevator) of an apartment house built in traditional style in 2002;
- 3 double bedrooms + living room + kitchen with all amenities of the early 2000s (e.g., air conditioning, central heating, door video system);
- located in East London, built on a former industrial site directly at the waterfront.

By using the scenario technique it becomes obvious that it is a property with high risks. For risk professionals this means that they incorporate the risk factors in their investment calculations, for instance by applying a higher discount factor or by estimating the likelihood of the scenario and its impact on the future resale price of the property. And what does it mean for appraisers? This might be clearer after the next chapter.

3. Incorporating uncertainty and risk in appraisals

3.1 *The current state of real estate risk analysis*

The systematic study of real estate risks started in the 1990s when the real estate research in general started to free itself from the capital market theory. In the following years it became more and more apparent that real estate is a special asset class which needs a special approach to risk analysis, i.e., the process of identifying, measuring and reporting risk. It would go beyond the scope of this article to provide a detailed literature overview; therefore I will characterize the state of the art and the current boundaries in general terms and mention particular studies important for appraisals in section 3.2.

In the opinion of the author the most popular research topics in the field of risk analysis are:

- risk measures;
- systematic and specific real estate risks;
- direct and indirect investments;
- construction of real estate indices;
- forecasting market movements including cycles and bubbles.

In one way or the other the bulk of the literature has to do with risk measures. In former times the volatility of *historical* returns was normally used. It was replaced by the volatility of *future* returns, based on cash flow calculations. In recent years several studies have shown that this risk measure also has several drawbacks. Hence, alternative quantitative measures such as value at risk, maximum drawdown or lower partial moments, but also qualitative measures such as rating grades or scores were introduced. They all have disadvantages themselves so that researchers are still searching for the ideal real estate risk ratio. Currently the research seems to go in two directions: developing a new “super measure” versus finding a smart combination of existing measures.

The systematic risk of real estate can be analyzed in similar ways as other market risks, the specific risks cannot. We do know how to analyze some of the most important idiosyncratic risks such as tenant default, natural disaster, or building cost overrun, but for many others there is no common definition yet, let alone a consensus about the correct measure.

A pragmatic reason for this deficiency is the lack of data about direct investments. Research on property-specific or location-specific risks requires data which is normally not available to the public—and often not even for the owners! Therefore most researchers concentrate on indirect investments; where there is ample public data, for instance, stock prices of real estate investments trusts.

For this kind of research real estate indices are very important. Depending on the market and the intended use different indices such as total return, price/rent, or stock market indices are necessary. A lot of research was done in the past so that today a variety of indices is available for many markets.

The better the indices, the better we do understand the workings of the real estate markets and the better our forecasting models get. Their accuracy has greatly improved. Nowadays researchers can predict the direction and turning points for the most liquid real estate markets with acceptable precision about 5 years in the future. However, forecasting when a bubble will burst is still not possible.

In the above list of research topics the identification and reporting of risk are not mentioned. These topics are clearly under-researched—in spite of their importance for practitioners. This is a noteworthy boundary of current real estate risk research. Other boundaries include measuring liquidity risk, integrating risks across different asset classes, creating an adequate risk culture, integrating risk attitudes and other human factors, and developing decision support tools. A lot of research needs to be done here.

The development of risk research in academia has deviated markedly from the development of real estate management in the real estate industry. On the one hand many important findings from real estate research have not yet found their way into risk management, and most real estate companies lag years behind what academics consider to be the common standard. On the other hand we have to acknowledge that researchers have ignored some urgent problems of practitioners and that important impulses for research came from the industry. A good example is the New Basel Capital Accord which was developed in the late 1990s. At that time neither researchers nor even the most advanced European banks were able to quantify the specific and systematic risks from commercial real estate loans. Nonetheless the Accord required the banks to apply quantitative methods, thus forcing the banks to initiate major research projects. The outcome were instruments which still today represent the state of the art in risk measurement.⁶

⁶ Reservation: This statement only applies to the internal real estate loan ratings which were developed under the Advanced Approach of the Basel Accord, not for securities ratings.

3.2 Proposals for improving real estate appraisals

In this section I compare the input, process, and output of risk analyses and appraisals. Naturally there are differences because analyses and appraisals serve different purposes; but naturally the users are confused if they deviate too much because in the end the analyzed/appraised property is the same. The purpose of the comparison is to demonstrate how findings from risk research can help to reduce the perceived gap and to improve the valuation accuracy.⁷

Input

The input for a typical real estate risk analysis consists of *current and forecast data for the property, the location, the market, and the environment*. Real estate appraisals often refrain from using forecasts, the rationale being (1) that prognoses are never fully certain or objective and (2) that speculative elements should not influence market prices. Exceptions are allowed, “if they can be expected with reasonable certainty on the basis of concrete facts”, as stated, for instance, in §2 of the German Valuation Ordinance (Immobilienwertermittlungsverordnung). In a strict sense this excludes all relevant forecasts, maybe with the exception of population projections.

It is doubtful whether this is justified. Ad 1: as mentioned before, real estate market forecasts have reached a level where they can effectively reduce uncertainty and—when standard procedures are used—eliminate subjectivity (for an overview see, for example, Bönner 2009; Brooks and Tsolacos 2010). Ad 2: every real estate crisis shows that appraisals are faulty if they only regard actual prices in a bubble market. But not only in such extreme situations can it be more risky to rely on market prices than to use cautious forecasts. As Larr and Riebe (1995, p. 30) explain, the cyclicity of the real estate market creates the illusion of a value acceleration. Hence, appraisal methods which assume static rents are always at risk to fall for this illusion.

Further differences between risk analysis and appraisal exist in the *number and sources of actual input figures*. Risk analysts usually strive to include as much information as possible into their models. This may or may not lead to better results, but it has one big advantage: a lot of data is being collected, which is available for examination and usage in the models if found useful. Appraisers on the other hand get by on relatively few components. True, “one of the perceived strengths of traditional valuations is their simplicity” (Sayce et al. 2006, p. 138), but thereby appraisers miss the chance to detect new risks and improve their models. Concerning the data sources a big difference is that appraisals often rely on data from the valuation literature. This is easy and helps to standardize appraisals. But often

⁷ Valuation accuracy is a subject of great debate in the literature. For essential contributions and summaries see, among others, Hager and Lord (1985), Adair et al. (1996), Crosby (2000), and Skitmore (2007). Furthermore, see the regular comparisons of sales prices and valuations published by IPD and RICS. Some of these studies have had great impact on the valuation profession in the past quarter of a century and also influenced the following proposals.

the data is unreliable because the books contains rules of thumb, figures drawn from past experience, and outdated tables which are not regularly tested empirically. Munneke and Trefzger (1998) and the following two examples show how far off the figures can be:

- The lag vacancy, i.e., the period in which a rental unit is vacant between two rental contracts, is often set to three months for offices in Germany (cf. Altmeyden 2006, p. 336, Straßer 2008, p. 48ff.). It is not known where this figure comes from, but there is a conspicuous resemblance with the categorization of the types of vacancy in the standard book on valuation by Kleiber (2007, p.1477). In an empirical survey Straßer (2008) could not even roughly verify the three months; her data exhibited a much higher mean with a considerable variance. Apparently a simple rule of thumb cannot do justice to the complexity of the reality. It would be better to use a deterministic model in which the lag vacancy simply depends on factors such as market vacancy rate and building quality or a probabilistic model like the one by Dryer and Mathieson (1995).
- The expected useful life of a property is difficult to estimate. Thanks to Baum and other authors (cf. Baum and McElhinney 1997) real estate research has made great progress in this field. But the valuation literature uses tables which seem to ignore that the useful life of some property types and markets was greatly diminished by factors like the technological change, structural vacancies, and the discussion about energy efficiency (cf. Barras and Clark 1996, Reed and Wilkinson 2005).

Process

Another distinguishing feature of risk analysis and appraisal is the calculation of risks. Appraisers commonly use global risk premiums whereas risk analysts try to consider as many risks as possible in an explicit way. As of today it is open which method yields better results, especially because there are many ways in between and risk analysts, too, use the "all-in" approach for risks they cannot measure. But there are at least two undisputable advantages for the explicit method: firstly, if the data allows, it is more precise and more transparent; secondly, it is the precondition for using separate risk models with causes and effects.

Let me illustrate this with the case of distressed properties and the risk of structural vacancy. This is an urgent problem in many European real estate markets. For instance, in Greater Munich and other large German cities several office buildings have been vacant for more than 10 years now. They were constructed in a period of overbuilding and have not had a single tenant since then. Standard appraisal methods are not made for such properties because they assume that the building will be fully let again after a certain time or try to capture everything with a risk premium for rental loss. Wincott (1997) and Simon (2003), among others, point out that it is possible, but difficult to adapt the methods. Furthermore, there are special approaches, such as the vacant possession value (see Schlitz 2006 for an overview). But in his study of valuation practice in the Netherlands he comes to the conclusion "that valuers face considerable uncertainty when estimating vacant properties. The variance in outcomes is significantly higher than for

let properties" (Schlitz 2006, p.3). What makes it so complicated is that "distressed real estate may suffer from a myriad of problems including market issues, capital availability, property-specific issues, and incompetent or undercapitalized ownership or management" (Anglyn 2005, p. 211). Based on an empirical survey Stanglmayr (2008) identified seven characteristics, in short:

- The earnings of a property depend on several factors which have to be regarded as an interactive and dynamic system.
- Changes in rental income are the result of a development process of these factors.
- The usual assumptions about earnings growth do not lead to valid results because some markets have collapsed.
- The self-regulatory power of the price mechanism is blocked. Sufficient structural measures are not financially feasible.

According to Anglyn (2005, pp. 211-215) the appraisers' task is to explain why these problems occurred, how they have affected the property and what ought to be done to turn it around. Stanglmayr (2008) put it this way: "A photo of the situation at the valuation date does not show the formation and dynamics of economic interrelations. A film of the relevant processes is more appropriate." And this is only possible, if the appraisers have a model of the system at hand!

Output

An often debated topic is the communication of the results to the stakeholders, e.g., the client, an investor, or the managing board. Typically risk reports show a range of possible outcomes and include a great amount of verbal and numeric information on a variety of risks; appraisals on the contrary state one value and include written explanations in which certain risks are mentioned. In the Mallinson-Report this is justified as follows: "It is clear that clients first and foremost want the valuer's judgment of a single figure, and they do not want that single figure clouded by more esoteric expressions." (RICS 1994, p. 42; in comparison see RICS 2011). Today the majorities of the clients are probably not considering information on risks "esoteric", but wish to be informed in detail about the underlying risks of the appraisal.

Larr and Riebe (1995), Mallinson and French (2000) and many others argue in favor of a range of values: "A singular approach masks the volatility of the real estate industry and creates a false sense of security [...]. Since appraisals are a combination of current fact and future expectations, relying on only one value indicates an unsupported confidence in both the appraisal process and the appraiser. [...] Valuation models should be adjusted to accept a range of likely projections and then used to provide a range of value within one standard deviation." (Larr and Riebe 1995, pp. 30-35)

Adair and Hutchinson (2005) take a different approach. They suggest a risk scoring to report the level of risk within property pricing. In a similar way other instruments from risk analysis could be used, for example scenarios in combination with confidence intervals, real option analysis (cf. Miller and Waller 2003), or Monte Carlo simulations (cf. French and Gabrielli 2005). From there it would not

be far to a contemporary risk report. But it would be unreasonable to go that far. Due to the different backgrounds and responsibilities of appraisers and risk analysts on the one side and of clients and managers on the other side it is doubtful that the originator and the receivers of appraisal reports could use all that additional information (cf. Joslin 2005; Wofford et al. 2011). Therefore the challenge is to improve the output of an appraisal in just the right way, maybe with the help of qualitative instruments known from the strategic management literature (cf. Alessandri 2004).

4. Conclusion

This article analyzed the differences between real estate appraisal and real estate risk analysis. Although it is in the nature of things that both are different, the gaps should not be too wide. It became apparent that this is not the case in some areas, which is maybe due to the different development of the two disciplines in the last 20 years. Real estate risk research has benefitted from developments in other areas such as banking and finance, and it is recommended that real estate appraisal should also be open to insights from other disciplines like strategic management (e.g., scenario writing) or risk analysis (e.g., the probabilistic view).

The world keeps changing at a breathtaking speed and appraisers should not pretend to deliver certainties in an uncertain world. Risk analysts on the other hand can learn from appraisers how to use their intuition and experience and express that in more than only quantitative ways.

Nobody knows whether the scenario developed in the article will meet reality in 20 years. But it is certain that the world will not remain as it is and that uncertainty has to be incorporated in all testimonies about the future, be it in real estate appraisal reports or in risk analysis reports. Therefore "an isolated analysis of mere financial variables is no longer adequate for capturing [...] property value. [...] Understanding the interactions and interdependencies between [the] different value-influencing factors, and incorporating this knowledge into valuation theory and practice ranks among the profession's biggest challenges" Lorenz et al. (2006, p. 13).

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