THE REAL ESTATE MARKET RISK OF BANKS — REVISITED

By

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– Working Paper –

June 2004

Abstract: Real estate lending is a risky business. There is ample international evidence of heavy bank losses or even failures that have resulted from defaulted real estate loans. It is especially during real estate crises that losses tend to rise dramatically, sometimes to the extent of endangering the banking system as a whole. Lenders do not appear to possess *all* the instruments required for managing *all* the risks inherent in real estate loans. One reason may be that the nature of real estate risks is not yet completely understood. Especially the real estate market risk, i.e., the risk arising from a market downturn (as opposed to the risk associated with an individual property), has not been fully researched and so is usually not adequately managed.

This article sheds some light on the nature of the real estate market risk of financial institutions, provides evidence of its significance and describes the status quo and likely advances in risk management in this field. It is an update on an earlier paper by the author (see: Lausberg, 2001) and also examines what changes the New Basel Capital Accord, also known as Basel II, has brought about.

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1. Real estate related assets of banks and their risks

In countries where a broad range of real estate activities is legal, real estate often constitutes a major item on a banks‘ balance sheet. In Germany, for example, housing loans alone make up over 48 percent of all domestic loans by the banking sector; add to this loans for commercial real estate, loans to the construction industry, direct real estate investments, and revenues from real estate related services, and it may safely be assumed that most German banks are in thrall to their real estate holdings.[1] Even though exposure to the real estate market is probably lower in most other countries, it is still high enough to constitute a significant risk for an average bank—and an even greater risk for specialized institutions like mortgage banks.

Table 1: Classes of real estate related assets

Direct investments	**Example**
Real estate owned for investment purposes	Equity investment in a project development
Other real estate owned	Repossessed real estate from a defaulted loan
Real estate leasing	Bank’s leasing subsidiary
Indirect investments (loans)	**Example**
Loans to the construction and real estate industry	Loans to real estate developers
Mortgage loans	Housing loans to private customers
Indirect investments (capital and other resources)	**Example**
Real estate related services	Fee income from real estate brokerage
Real estate funds	Fee income from initiating a real estate fund
Investments in real estate related companies	Dividends from REITs

What the classes of real estate activities shown in Table 1 have in common is their exposure to the same two types of risk: specific real estate risks (e.g., vacancy risk) and the systematic real estate risk. Modern Portfolio Theory defines the systematic or **market risk** as *that part of the total risk that cannot be eliminated by diversification* since it is caused by economic changes that affect all investments. In the same vein, **real estate market risk (REMR)** may be defined as *the non-diversifiable risk that can be attributed to the fluctuations of the real estate market*. Banks have long concentrated on the management of specific risks and have developed numerous useful instruments to this end, for example credit ratings; their REMR, however, has been widely neglected by both practitioners and academics. This is all the more surprising as its significance for financial institutions becomes painfully evident in every downturn of the real estate cycle, when falling real estate prices lead to a large number of loan defaults and several bank failures.

A closer look reveals that the REMR has many variants:

- First, there is a **direct real estate market risk** if the value of an asset is directly linked to the real estate market, i.e., a change in the general price level of the real estate market will be reflected in the market price of a piece of real estate and cannot be offset by any entrepreneurial measures. By definition, only direct investments are exposed to this type of risk.
- Second, there is an **indirect real estate market risk** if the value of an asset is only indirectly linked to the real estate market because other factors, such as the borrower's creditworthiness or managerial decisions, act as a buffer against market movements. The following four types of indirect REMR exist: **Credit risk** is the danger that real estate market fluctuations reduce a borrower's creditworthiness. **Collateral risk** exists if an adverse market trend can cause the value of the secured property to fall. A **profitability risk** implies that real estate market fluctuations endanger the profitability of an investment; and a **price risk** exists if the real estate market has a negative influence on other market prices, such as stock prices.

Figure 1: Effects and types of real estate market risk (REMR)

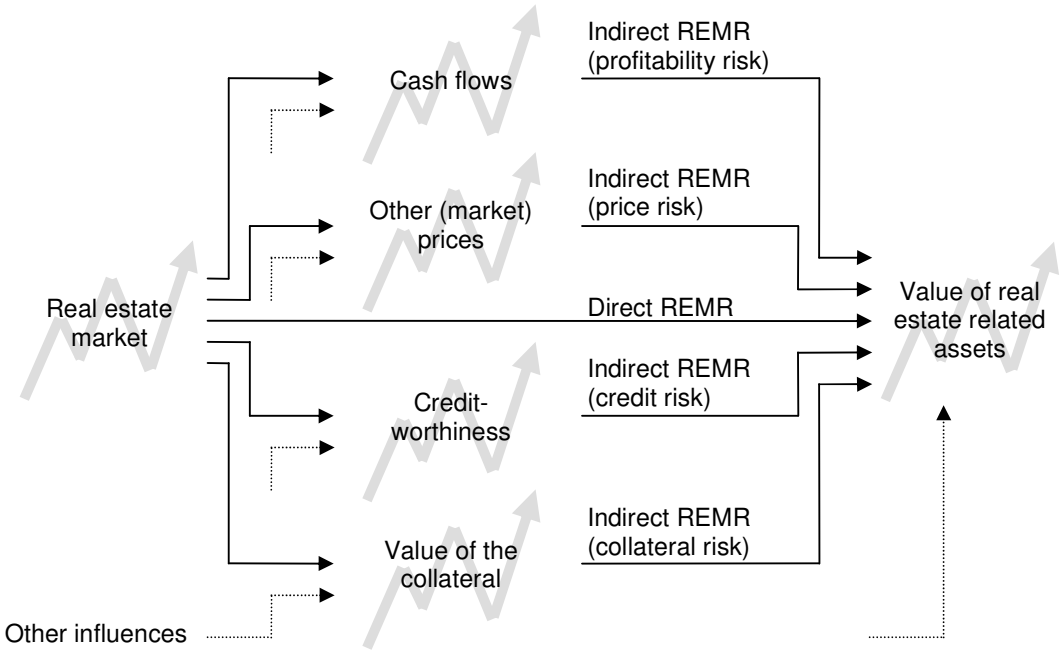

Figure 1 shows the effects of the various risks: If the real estate market moves (gray arrow), the value of a real estate related asset also moves—either directly (straight black arrow) or

[1] Exact figures for these activities are unavailable because they are not separately stated on the balance sheets of German banks or listed in the statistics of the Deutsche Bundesbank.

indirectly (angled black arrows). A dotted black arrow indicates that other factors that are not mentioned here also play a role, for instance creditor industry developments.

Our classification combines the cause-oriented with the effect-oriented approach which is the first step toward managing a bank's total market risk: REMR is a function of the real estate market's (expected) volatility, the sensitivity of an asset or an intermediary element to market movements, the interdependencies of the effects, the volume of a real estate related asset, and the net effect of other influences. We will elaborate on this in part 3, but first we want to examine how important REMR is, i.e., whether managing real estate market risk is worthwhile.

2. Evidence supporting the significance of the real estate market risk of banks

The REMR of financial institutions cannot be measured using information generally available to the public. Consequently, indirect ways must be found to assess its importance:

- Some studies indicate that the systematic portion of a real estate portfolio's total real estate risk is relatively small when compared to a stock portfolio's market risk.[2] This can be explained by the extreme heterogeneity of the real estate market, where—due to the immobility of the traded assets—each asset is unique and, hence, has its own market which cannot be fully captured by an overall market index. However, the evidence is mixed and does not necessarily apply to banks with their unique blend of direct and indirect investments. Furthermore, we do not know how much of the total risk banks can diversify away and how much risk remains after using hedging instruments.
- Other studies show a significant correlation between the systemic risk in the financial services industry and the real estate market.[3] It can be concluded from these that real estate crises were actually one of the key reasons behind most of the major banking crises of the last two decades, thus confirming the importance of the REMR at the macro level.
- Examination of individual banking firms also reveals much evidence of the heavy influence of real estate market volatility on the performance of mortgage loans which, as explained above, are a major item on many banks' balance sheets.[4]

Yet again, these studies fail to provide a *measure* for the significance of the REMR. For this purpose, it seems most appropriate to employ methods from capital market research, such as

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[2] See, for instance, Capozza/Schwann (1990).

[3] Cole/Fenn (1994), for example, look into the relationship between commercial real estate lending and bank failures during the US banking crisis of the late 1980s; Ghosh/Guttery/Sirmans (1994) find similar evidence for the UK.

[4] See Vandell (1992), Murray (2003).

factor models based on the Arbitrage Pricing Theory (APT). These models explain the return of bank stocks as a function of systematic factors such as interest rates, exchange rates, inflation, and real estate. The basic form of such a model is:

$$R_{it} = \beta_0 + \beta_1 R_{Mt} + \beta_2 I_t + \beta_3 R_{Rt} + e_{it}$$

where R_{it} represents the return on a portfolio of bank stocks i in period t, R_M is the stock market return, I_t stands for the interest rate, R_R is the real estate market return, e_{it} is an error term, and $\beta_{0,\,1,\,2,\,3}$ are the intercept and the respective sensitivities. One can hypothesize that bank stock returns correlate positively with the real estate market.

Several studies in recent years have tested this hypothesis.[5] Virtually all of them found a significant positive relationship, i.e., bank stock returns are highly sensitive to changes in real estate returns, although the examined variables, time periods, and markets differed greatly. The real estate factor was generally found to be less influential than the stock market factor, but in the case of some banks (e.g., German mortgage banks) it turned out to have a stronger impact than the interest rate factor. Together with the 'considerable' exposure to real estate mentioned earlier, these results clearly support the significance of REMR. This leads us to the question of whether banks have the right instruments in place to handle real estate market risk.[6]

3. Managing the real estate market risk

It is useful to divide risk management into the following two phases: (1) identification and measurement and (2) controlling and hedging of risk because they involve very different concepts and thus require different instruments (see Figure 2).[7] From another perspective, risk management can deal with risks (A) at single asset level, or (B) at portfolio level, and, here again, different instruments are required. This two-dimensional framework can be applied to examine REMR management with respect to the three main classes of real estate related assets.

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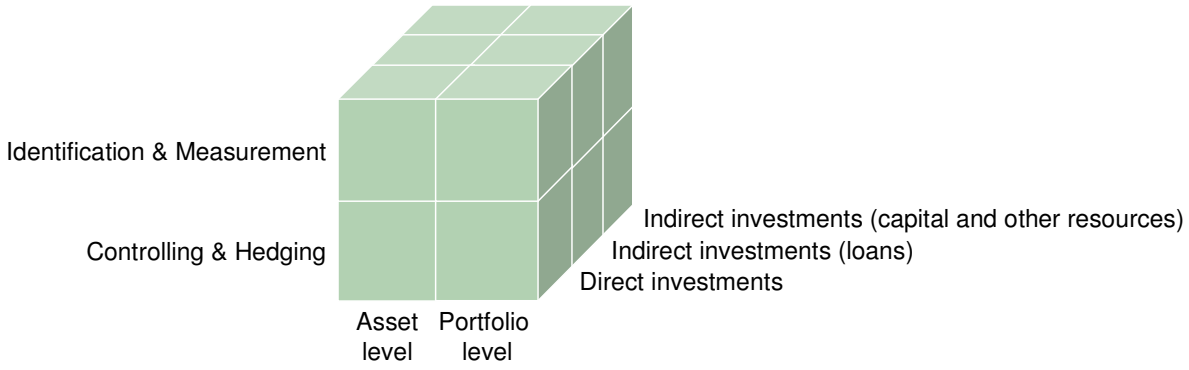
[5] See Mei/Saunders (1995), Allen/Madura/Wiant (1995), He/Myer/Webb (1996), Lausberg (1997), He/Reichert (2003).

[6] For obvious reasons this question cannot be answered from an evaluation of the literature alone. Supplementally we use the results of numerous interviews with experts and our consulting experience to report the status quo.

[7] In the literature many other divisions and expressions can be found; equally, other dimensions such as geographies or size classes could be added.

Figure 2: Dimensions of managing real estate market risk



Direct investments

The risk management process usually begins with **risk identification**, i.e., the awareness that there is a certain risk connected with a transaction, an organizational unit, or a process. To avoid overlooking substantial risks, a risk inventory needs to be conducted for each relevant area, i.e., all risks and existing control measures are recorded and evaluated by means of interviews, data analyses, and workshops. Techniques like 'Mind Mapping' are also helpful in systematically searching for risks. Systematic risk identification is relatively rare in practice and banks only apply it in those areas in which they are forced to by legal and / or supervisory regulations.

Subsequently, identified risks are **measured**. However, there is disagreement about the correct definition of 'risk'—not only within the banking and the real estate sector, but also among researchers. For stocks and many other investments, historic volatility is the standard measure of market risk and serves as a basis for Modern Portfolio Theory and other concepts. For real estate, however, this approach is inappropriate because of the peculiarities of the investment vehicle real estate that mainly have to do with transaction time and pricing which are very different than in other markets. As an alternative, some researchers and practitioners advocate a forecast-based risk definition that mirrors the uncertainty of the future development of a real estate market.[8]

Today, real estate market **forecasts** can be obtained from many different institutions, but only a very small number—usually renowned market research institutes—have the necessary data and resources to develop complex econometric or similar models that are sufficiently reliable. It goes without saying that such forecasts are pricey and, as a result, are only being used by a handful of banks at present. The majority of the world's top 100 banks are somewhat less ambitious: they collect or buy selected market data in a more or less systematic fashion and they evaluate the

[8] See, for instance, Wheaton et al. (2001).

market reports of their own or external experts and economists. Subsequently, they develop a well-founded opinion on future market developments based on these findings. However, the large majority of financial institutions have neither the reliable market data nor the appropriate models needed for measuring the REMR to any meaningful degree. Basel could spell the answer! In order to meet the requirements of Basel II[9] regarding internal ratings for special lending in real estate, a number of banks are developing forecasting models and market scorings (see the section on loans below) that can also easily be applied to direct investments.

No integrated approach to managing real estate risks is in place yet at the **portfolio level**. Until recently, a bank's premises were considered 'off limits' because they were strategic assets and not investment vehicles. In addition, a bank's sole interest in repossessed property was to dispose of it as quickly as possible so as to minimize losses. And, lastly, the majority of 'genuine' real estate investments were major individual transactions that did not readily lend themselves to a portfolio approach. However, changes are becoming apparent: the number of banks, for example, that sell and lease back their headquarters and other premises and thus (partially) transfer their REMR to the lessor is increasing (obviously this does not work if the lessor—as is often the case—is the bank's own subsidiary). Furthermore, the idea of portfolio management has become quite popular among banks with large real estate holdings. To this end, banks have a choice of state of the art instruments that were initially developed for real estate funds and other property companies for similar purposes. But not even these 'real estate professionals' possess the large range of sophisticated modern (risk) management tools that might be expected given today's level of academic knowledge of real estate risks and risk management.

Indirect investments: loans

In general, **measurement** of credit risk made a quantum leap in the past few years. Put under pressure by Basel II, banks, with the help of consulting companies, have developed much more reliable rating methods for measuring the probability of default by a borrower and the loss given default. The major difference between today's rating systems and the pre-Basel II systems is the use of sophisticated statistical methods and the increased intensity and complexity of data analysis. However, this does not mean that developing a rating or applying it in the loan review process can be carried out automatically—on the contrary, the heterogeneity of real estate projects and the existing real estate market data constraints make expert knowledge, experience, and a risk-sensitive attitude indispensable.

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[9] "Basel II" is the synonym for "The New Basel Capital Accord" of the Committee on Banking Supervision of the Bank for International Settlements in Basel, Switzerland, which is designed to better align regulatory capital of banks to the underlying risks by encouraging better and more systematic risk management practices.

A real estate **rating** is usually based on the following elements: market, loan, creditworthiness, and property and / or collateral. The rating is calculated by means of a scorecard, a (Monte Carlo) simulation of the expected cash flows, or hybrid models. The leading banks and banking associations already have instruments in place for a trial run,[10] and a number of others are expected to follow suit until the Basel Accord comes into force in 2007. However, it is very likely, that even in three years time, these sophisticated real estate finance methods will still not be used by a large majority of banks, and that will leave much room for improvement in the banking industry. In addition, it is interesting to note that the improved measurement of REMR is only a byproduct of the improved measurement of credit risk, because the real estate market 'happens' to have a major influence on the risk of mortgage loans and on real estate industry borrowers. Even the leading financial institutions do not usually isolate the REMR identified by the ratings for further calculations or processing.

Another area in need of improvement are **early warning systems**. Many banks are using more or less sophisticated systems from the pre-Basel II era, i.e., these systems do not yet incorporate the improvements that have been made in risk quantification over the last few years. Most importantly, however, rating and early warning systems that serve different purposes need to be coordinated. For example, developing scorecards might reveal factors that are unsuitable for a Basel II rating due to their relative unreliability, but that are very useful for an early warning system which is aimed at a graduated reaction instead of a credit decision.

The **portfolio level** instruments for risk measurement and control have also greatly improved in recent years. Today, the top banks are able to determine the impact of a single new loan on portfolio risk and return, to simulate the effects of real estate market changes, and to identify concentrations in their loan portfolio. To our knowledge, however, banks are not yet measuring a portfolio's REMR as an individual risk in its own right since the major key indicators, such as RAROC (risk adjusted return on capital), do not differentiate between sub-risks. Suitable and tried and tested instruments for the isolated measurement of REMR such as sensitivity analyses, scenario analyses, and value at risk methods already exist and only need to be adapted to real estate.[11]

The same applies to **controlling and hedging** of REMR: the real world still has a long way to go before it catches up with what is technologically feasible. It is possible today to calculate measures for optimizing the risk and return of a real estate loan portfolio, but the adjustment of the

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[10] A description of an advanced internal rating system is given by Hagen/Holter (2002).

[11] "Value at risk" is a measure of potential loss from a market risk. It is widely used in bank portfolio management and is gaining acceptance in other areas as well, for instance in real estate investment analysis; see Kevenides (2002).

actual portfolio to the target portfolio must still be realized mainly through new business, and thus remains sub-optimal. The most promising ways to improve this situation are the following:[12]

- **Risk re-allocation:** The traditional instruments for risk re-allocation are securitization and portfolio sales which transfer the risks to the buyers. Over the last few years, both types of business have experienced strong growth worldwide and this trend is generally expected to continue because the market is becoming more liquid and, consequently, more attractive. In addition, standard methods for measuring risk and return are emerging and becoming established. Innovative instruments such as the transfer of the residual value risk of a real estate loan or of a leasing transaction to an insurance company are only rarely the methods of choice. In the past, reinsurance companies were prepared to take on such risks, but the market situation has since changed.
- **Risk premiums:** Banks do not seem to be interested in REMR risk premiums at present. Risk based pricing of loans is a near term goal that will be greatly facilitated by Basel II ratings. However, there is no specific REMR risk premium currently under discussion and it would also probably be rather difficult to implement.[13]
- **Risk compensation:** As with other market risks, controlling and hedging with futures and options, swaps, and similar forms of hedges is theoretically the most efficient and most effective approach. However, there is still no market for these methods. Take real estate swaps for example: From time to time reports appear about swaps in which—as in financial swaps—comparative cost advantages and different market valuations are used to balance out different cash flows from different real estate positions to the advantage of all participants.[14] However, these are isolated transactions and the chances of finding a counterparty for any given risk position at an acceptable price are remote. Futures and options face almost the same situation. In the past, several contracts have been launched on stock exchanges or as OTC instruments, but the majority have been withdrawn again after a relatively short time, mainly due to a lack of demand.[15] London is the birthplace of the most recent innovation in which investors engage in spread betting on a real estate index. This offer is mainly geared to home owners, but institutional investors also participate because they believe it offers interesting hedging possibilities.[16] Macro hedges, i.e., derivatives based on macro-economic statistics, are also quite

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[12] Other general possibilities mentioned in the literature are diversification, risk splitting and pooling, and limits.

[13] This is not to say that a premium for the REMR is *not* incorporated into the price for real estate loans at all; there has always been an *implicit* pricing of residual, market, and other risks in individual loans; see Griffith (2001).

[14] See, for instance, Buttimer/Kau/Slawson (1997).

[15] Cf., Hübner (2002), p. 41ff.

[16] See Iacoviello/Ortalo-Magné (2003), p. 206.

new. In theory, they enable hedging of REMR which, as is widely known, exhibits a strong correlation with unemployment and other macro-economic factors.[17] However, it is very unlikely that this is already being used for this purpose.

Indirect investments (capital and other resources)

In contrast to loans, there are hardly any signs of active management of the REMR of other indirect investments. This is all the more surprising since a relationship with the property market is sometimes very obvious. The turnover and profits of real estate brokers, for example, show a high correlation with the real estate market because they depend directly on the market price and transaction volume. The same is true for, among other things, the commission from selling real estate funds and the dividends on shares of real estate companies. Altogether, the capital and other resources tied up in indirect investments may be comparatively small. However, many financial institutions, in their search for additional fee income, have steadily expanded their activities in this area in recent years.

Therefore, the urgent priorities would seem to be to identify the remainder of a bank's real estate activities under the aspect of the volatility of future returns caused by the real estate market, to compute that risk and—if necessary—to hedge it. Taken one step further, the idea of REMR should stretch to **total investments,** meaning that a bank should strive for integrated management of all exposures to the REMR, no matter from what source or of what type.

Theoretically this integration could be done using the same instruments as loan portfolio management, but there are still too many obstacles to overcome, such as the calculation of correlations among the asset classes. A simpler, more practical solution could be to start with a sensitivity analysis that gives a rough idea about how much the value of a bank's real estate related assets changes when the real estate market changes by a certain percentage. What a bank mainly needs for this is a calculation of the value and the sensitivities of the different asset classes that are summed up for the total REMR. This figure can then be used for controlling and hedging, although, frankly, this would seem to be wishful thinking at present.

4. Conclusion

This article has demonstrated that most financial institutions show serious deficits in managing the REMR, despite the fact that this risk has a high significance for the industry in

[17] See, for example, Broll/Schweimayer/Welzel (2004), who cite Deutsche Bank's options on economic statistics, e.g.,

general. It follows logically that many banks are in urgent need of new methods and instruments to measure and control real estate market risk. Even the leading banks in real estate finance, which use sophisticated tools for their real estate loan portfolio, are still a long way from the idea of a complete and integrated view of REMR. But there are signs that some of the preconditions for effective management of REMR are improving, for instance:

- Banks and other participants in the real estate market have realized the **importance of data**. Therefore major efforts are being undertaken to systematically collect data, improve historical time series, or construct representative indices. This will help to overcome some of today's obstacles, such as the lack of knowledge about the distribution of real estate returns or the emergence of real estate crises.
- The **pace of development** of instruments for real estate risk management has increased enormously in recent years, especially under the pressure of Basel II. This process is irreversible, and it can be expected that internal rating systems and other new tools will soon spread through the industry.
- There are even encouraging signs that **hedging** of REMR by swaps and other innovative instruments could soon become more feasible, which would certainly trigger a revolution in real estate finance. But, comparable to the situation 20 years ago, when derivatives on stocks, exchange rates, and interest rates were becoming fashionable, a breakthrough will depend on many factors, such as the legal framework, the existence of market makers, the suitability of contracts, and reliable indices.

However, all these advances are irrelevant if the human factor in risk management is neglected. After all, the success of risk management does not mainly depend on the degree of sophistication of its tools, but on the human beings who use these tools. Therefore, the banks' most important tasks are to educate their employees, to develop useful instruments for them, and to create a culture in which risk is consciously dealt with and the opportunities and limitations of risk management are understood. This will go a long way towards making real estate lending a less risky business.

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