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# Open-End Real Estate Funds in Germany – Genesis and Crisis

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## I. Introduction

Open-end real estate funds are indirect real estate investment vehicles that are of particular importance in Germany.[1] Shares are directly backed by the properties and liquid assets held by the fund. In contrast to a closed fund structure, an open-end investment fund continuously creates new shares on demand. Investors can buy shares at net asset value from the fund and may redeem them on a daily basis at the prevailing net asset value, which can be higher or lower than the initial price at which the investors bought. Consequently, even though shares are typically not traded on a secondary market, they are a highly liquid investment.[2] The price is quoted once a day based on the regular valuations of the properties and liquid assets at that time. Since the regular valuations are typically done only once a year on a rolling basis for each property, the redemption value of a fund's shares adjusts slowly to changes in the market price of the underlying properties.

In contrast to the experience in other countries, in Germany this fund construction showed a remarkable degree of stability until recently. However, in December 2005 the closure of Deutsche Bank's open-end real estate fund Grundbesitz Invest triggered a credibility crisis in this

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[1] For example, see *Maurer* (2004) and *Klug* (2004) for a description of open-end real estate funds and their importance in Germany.

[2] For some funds there also exists a small secondary market located at certain regional exchanges in Germany. However, these markets are not very liquid and the trading of shares on these exchanges will typically be suspended in crisis situations.

industry that put the stability of most of these funds at risk. In the public debate on how to solve this crisis and prevent future ones, several proposals have been raised. In this paper, we try to evaluate these recommendations.

In order to do so, we first analyze why the open-end structure of real estate funds was particularly prevailing in Germany. Interestingly, applying recent banking theory to this issue we find that there might have been good reasons for choosing an open-end structure that is fragile and susceptible to credibility crises. Based on the reasons that might have led to the emergence of open-end funds in Germany in the first place, we analyze the measures proposed to increase their resilience. We find that some of the recommended measures that are meant to improve liquidity control, valuation procedures and transparency are actually counterproductive and may increase the funds' susceptibility to crises even further.

Our analysis departs from a detailed examination of international experiences with open-end real estate funds in section II. Section III. focuses on the institutional and regulatory design of open-end property funds in Germany and emphasizes the incentive structure that arises between investors, fund managers and fund owners. Section IV. evaluates different theoretical arguments why this incentive structure might have been so successful in the German bank-dominated financial system. However, we also point out its innate drawbacks. In section V. we try to link this dark side of open-end property funds to the observed troubles in Germany at the end of 2005, particularly to the closure of Deutsche Bank's fund Grundbesitz Invest. While sections IV. and V. only take the view of an individual fund, section VI. discusses the disadvantages of the open-end structure from the industry's perspective by taking different externalities into account. Corroborating the relevance of these externalities, section VII. describes the onset of a widespread credibility crisis of open-end property funds after the closure of DB real estates Grundbesitz Invest. In particular, it discusses the chronology of events that led to the closure of another fund in the course of the crisis. Based on these findings, section VIII. tries to derive some policy recommendations and evaluates the most important proposals raised in the aftermath of the funds' demise.

## II. Open-end Real Estate Funds – An International Comparison

In the late 1980s, the Dutch fund RODAMCO was one of the largest real estate funds in the world.[3] It was owned by Robeco Group, at that time the largest independent European investment group that managed funds. Robeco followed a policy of tacitly guaranteeing fund prices. Thus, for 11 years prior to September 1990, Robeco bought back shares of Rodamco at net asset value from any investor wishing to sell. Low interest rates in the late 1980s made an investment in RODAMCOs shares particulary interesting, since it offered a return of about 3 percent higher than a bank deposit. Due to the open structure, a large flow of speculative capital into the fund resulted. At this time, the fund had about three quarters of its assets invested in the US and UK real estate market.

In 1990, however, the rise of interest rates caused a high outflow of capital. At the same time, the US-market – and thus RODAMCOs portfolio – was affected by a severe drop in real estate prices. This should have had an adverse impact on RODAMCO's share price, because in an open-end structure the unit price is determined by dividing the total asset value of property and cash by the number of units. Given the standard valuation rule in place in the Netherlands at that time, however, stating that all fund properties are only appraised *simultaneously* once at the end of the fiscal year, investors could predict that the redemption price was going to suffer a severe decline at a future point in time, i. e. the end of the year 1990. In that situation it was individually optimal for investors to redeem their shares before and buy them back after the re-appraisal. Hence, arbitrage had become possible, and that is what investors did on a large scale in September 1990.[4] Robeco, however, reacted by suspending its traditional policy of buying back shares when asked to do so by investors. Eventually, severe liquidity problems forced the management to transform the fund into a stock-listed closed fund.[5]

A similar crisis occurred at about the same time in the Australian open-end real estate funds market. In particular after the stock market crash of 1987, which caused a strong increase in property prices, the

[3] See also *Sebastian/Tyrell* (2006) for a more detailed description.

[4] Of course, selling shares and buying them back after a short time period always involves transaction costs. However, in the situation described above the expected price drop outweighed transaction costs, making such a strategy profitable despite the involved costs.

[5] See *Boot/Greenbaum/Thakor* (1993), *Helmer* (1997) and *Lee* (2000) for more details.

Australian real estate market saw huge inflows of capital. This surge was supported even further by the credit policy of Australian banks, which lent out loans collateralized by real estate at exceptionally low interest rates. When the central bank tightened monetary policy, property prices dropped by around 60 %.[6] This, in turn, caused a run by investors in order to redeem their shares of open-end real estate funds. To avoid a collapse of those investment vehicles, the government decided to stop all redemptions for a period of 12 months and forced all funds to list on the stock exchange (Little (1992)).

In Switzerland the first open-end real estate fund was founded as early as 1938. Switzerland was also one of the first countries to introduce a regulation for open-end property funds in 1967. Facing irregularities with redemption prices in 1991, the authorities adapted the regulations codified in the *"Anlagefondsgesetz"* (AFG). According to these criteria, redemptions are only possible after a notice of termination within a twelve months period before the end of the fiscal year (art. 42 AFG). This requirement should ensure that the fund management has enough time to acquire sufficient liquidity if necessary. On the other hand, the depository bank has to organize a continuous trade of shares, in general by trading on the stock exchange. As a result of the new regulations, most of the trading takes place at the stock exchange and Swiss open-end real estate funds do neither emit nor redeem units in relevant amounts. Consequently, Swiss open-end funds are comparable to stock-listed closed funds with a limited redemption possibility.[7]

Summarizing these international experiences, open-end real estate funds in all these countries did not survive as a successful investment class because of their inherent fragility. Crisis events in the real estate market forced legislators to transform these investment vehicles into a closed-end structure in order to avoid a run phenomenon that could trigger further uncertainties in the financial sector. In addition, the financial structure of the respective countries obviously had a strong influence on the different characteristics of open-end real estate funds.

[6] See *Allen/Gale* (2000) for a theoretical explanation of asset price bubbles related to an inefficient expansion of credit caused by risk shifting behavior of the banking sector.

[7] As emissions only take place occasionally, *Hoesli* (1993) refers to these funds as "semi closed-end".

## III. The Institutional Design of Open-End Real Estate Funds in Germany

German open-end real estate funds were the only exception internationally to have been very successful for almost 50 years. One reason for this may be found in the specific regulatory and institutional design of the German funds. Let us first explore the regulatory design. In setting up the German Investment Companies Act in 1969 ("*Investmentgesetz* (InvG)"), the regulation comprised a number of measures to limit the risk of liquidity crises despite funds' obligation of daily redemption of shares. One of the most important measures in this respect requires German real estate funds to hold at least 5 % of their assets in cash, with a maximum of 50 % allowed. Until the crisis of 2005/2006, the funds held 25-49 % of their assets in cash or bonds. Furthermore, the funds are allowed to maintain a leverage of up to 50 % of their real estate assets' value. In addition, they can delay the repurchase of units for a period up to two years in case of high liquidity outflows. However, since 1959 this possibility of last resort has never been used until 2005.[8]

In addition, different elements of the investment practice and valuation process also improved funds' resilience against liquidity crisis even if they were not initially implemented for that reason. One such element is the offering charge of usually 5 % which becomes due on buying a share of an open-end real estate fund. Originally designated for covering distribution costs, these built-in transaction costs create an effective barrier to reduce the attractiveness of frequent transactions and thereby limit arbitrage opportunities. Furthermore, due to the offering charge, the necessary investment horizon to achieve a positive return increases to at least one year on average.

Another important aspect that represents a somewhat unique feature of the German funds' design relates to the process of evaluating the funds' assets. While financial assets are valued according to their market prices, the value of each property in the fund's portfolio is based on an appraisal by experts. Under the Investment Companies Act, the funds are required to have their property assets valued by an independent panel of experts each time they acquire or sell a property. Additionally, the whole portfolio has to be evaluated on a rolling basis every 12 months. Hence, the apprai-

[8] For a further description of the institutional framework of German open-end funds see *Maurer/Sebastian* (2002), *Maurer* (2004) and *Maurer/Reiner/Rogalla* (2005).

sal of the funds' properties takes place at different dates during the fiscal year, which results in a staggered valuation process. As a consequence, the effect of a change in asset values on the redemption prices is smoothed and discrete jumps in the redemption rate creating arbitrage opportunities for investors are limited. Further smoothing is accomplished via the valuation methods. As has been emphasized by Maurer/Reiner/Rogalla (2005), property appraisals tend to lag movements in the property market and understate the true volatility of returns in the underlying property values. This may be the result of appraisal "anchoring" to previous evaluations, aggregation of information over time, and the use of valuation methods based on yield analysis instead of cash flows – a procedure which in general will be considered as hardly market-based.[9] Of at least the same importance is the institutional framework in which the German open-end real estate funds are embedded. By law, only an investment fund management company ("Kapitalanlagegesellschaft") is allowed to manage open-end real estate funds. The investment fund management company is typically set up in the legal form of a limited liability company and usually manages several different mutual funds, not only open-end property funds. From a legal perspective, the open-end fund itself is a special asset pool funded by the investors' contribution on an open-end basis, which must be strictly separated from the other funds and the investment company's own assets. Interestingly, in Germany the shareholders of these investment fund management companies are mostly commercial banks and insurance companies and are therefore not identical with the investors holding the open-end property funds' shares.

By the end of 2005, 31 open-end funds were managed by 16 investment management companies registered in Germany. These funds had more than EUR 85 billion assets under management, which amounts to more than 15.5 % of the total managed by German mutual funds. This figure went up from EUR 47 billion in 2000, averaging a net cash inflow in these 5 years of more than EUR 7 billion. Because most of the funds are owned by commercial banks, it comes as no surprise that around 70 % of all fund sales are brokered by banks, which use their network of branches throughout Germany as distribution channel.

Along with the huge capital inflow of the last years, the investor structure has changed substantially. Even though private investors, who were searching for less risky assets after the stock market crash in 2001, in-

[9] See also *Morgan* (1998) and *McParland/Adair/McGreal* (2002) for a similar assessment.

vested heavily into open-end property funds, particularly institutional investors turned to this type of fund in recent years as an alterative to money market funds – despite the fact that open-end property funds were traditionally set up mainly for private investors.[10] Interestingly, institutional investors were not required to pay the offering charge of 5 %. Hence, they did not have to bear the built-in transaction costs when moving in and out of these funds.

Examining the historical risk-return profile of open-end real estate funds in Germany over the period 1980-2002, we find that, in comparison to equity and bonds, real estate funds exhibited by far the lowest volatility. The average nominal respectively real return on real estate funds was clearly below the average return on equity, but only slightly lower than the return on bonds. On a yearly basis, between 1959 and 2004 open-end real estate funds yielded an average return of about 4 %, without a single year displaying a negative performance (Klug (2004)). For that reason, in recent years some open-end real estate funds actually advertised an implicit promise to investors of a yearly return of at least 3 %. Thus, in summary, open-end real estate funds in Germany exhibit risk-return characteristics that are different from any other asset class and that make them attractive both for institutional and private investors.[11]

## IV. Theoretical Arguments for Open-End Real Estate Funds

### *1. Liquidity Insurance*

In the aftermath of the severe stock market crash in 2001, investors developed a strong awareness of the liquidity risk associated with long-term though marketable investments like stocks and investment fund shares. Thus, one of the main sales argument for open-end real estate funds, that contributed to their take-off immediately after the stock markets crashed, was the guaranteed redemption of fund shares and the fact that the staggered evaluation of underlying assets promised a very moderate volatility of the redemption rates. The open-end structure of real estate funds hence offered investors a liquidity insurance.

[10] In Germany, apart from public open-end real estate funds also special property funds exist, which are designated for a limited number, i. e. up to 10, of institutional investors. These special funds are usually managed by the same investment companies that offer also public open-end property funds.

[11] See also *Maurer/Reiner/Rogalla* (2005), who provide an in-depth analysis of the risk-return profile of German open-end real estate funds.

Similar to the argument that Diamond/Dybvig (1983) develop for bank deposits, investors' demand for liquidity insurance might result from the fact that, by the time of their investment decision, investors do not know exactly when they will actually need their funds back. Risk-avers investors will therefore prefer an investment product that provides them with comparably smooth repayments irrespective of whether they redeem their funds early or late. By holding parts of the portfolio in liquid but less profitable assets, open-end real estate funds can promise a rather high redemption in the short-run at the expense of returns to long-term investors which remain below the average long-term yield on pure property investments. Thus, ex-post those investors that happen to hold their shares relatively long implicitly cross-subsidize the higher short-term repayment to those investors that turn out to require their funds back earlier. Since funds' share holders are assumed to be risk avers, this liquidity insurance is ex-ante appreciated by investors and is welfare enhancing.

Following the argument of Qi (1994), originally developed for the case of bank deposits, the costs of this liquidity insurance obviously decline if the fund can expect additional liquidity inflow in the short-run from issuing new shares. The fund then needs to hold fewer liquid and low-return assets as insurance against the expected early redemption of impatient investors. Still, the costs of this liquidity insurance to long-term investors, i. e. the implicit cross-subsidy paid by long-term investors, are apparently increasing in the average fraction of investors redeeming their fund shares early. Put differently, the shorter the average holding period of fund shares, the lower is the average return that these funds can promise.

The increased engagement in property funds by institutional investors who used open-end real estate funds as a substitute for money market funds to store liquidity, dramatically reduced average investment horizons in these property funds. The higher short-run yield that institutional investors realized in these open-end property funds as compared to money market investments were essentially borne by small investors with generally longer investment horizons. This undermined the efficiency of the liquidity insurance provided by these funds.

The staggered adjustment of the redemption rates to changes in the market value of the property held by the fund also enabled open-end real estate funds to offer an intertemporal smoothing of asset price shocks to its long-term investors. Following the mechanism described by

Allen/Gale (1997) for the banking industry, the staggered adjustment of the redemption rate allows open-end property funds to build up reserves in times of increasing asset prices. These reserves can be used to stabilize the redemption rate above the market value of the fund's underlying assets in periods of declining asset prices. Thus, given risk averse investors, the funds' ability to intertemporarily smooth shocks allows them to offer an additional efficiency enhancing insurance. However, this insurance function of open-end funds is again undermined by institutional investors. Succumbing to lower transaction costs typically, they can exploit intertemporal arbitrage opportunities that the intertemporal smoothing of property price shocks by open-end real estate funds generates.

### *2. Liquidity Transformation as Disciplining Device*

Even though the liquidity insurance provision of open-end real estate funds might have contributed to the emergence of these investment products, it is unlikely that this has been the only factor. Particularly the observation that open-end property funds play a truly dominant role only in Germany cannot be explained by this universal efficiency gain.

A probably more convincing argument for the long-lasting success of open-end real estate funds in Germany can be made with regard to the disciplining role involved with this financing instrument. This argument is based on the idea that redeemable claims serve a control function, an idea that can be traced back to Fama/Jensen (1983). In banking theory particularly Calomiris/Kahn (1991) and Diamond/Rajan (2001) emphasize that refinancing illiquid assets with liquid liabilities – like deposits – held by multiple investors can serve as a disciplining device for the bank management. The fragile structure due to the liquidity transformation allows the bank manager to credibly refrain from moral hazard.[12] This is due to the fact that each individual investor has an incentive to redeem his deposits as soon as he perceives any misbehavior of the manager. If he withdraws his funds immediately, he receives the face value of his deposits. If he waits, in contrast, the bank might not be able to repay due to the manager's misbehavior. Moreover, knowing that many other de-

[12] Similarly, *Goodhart* (1987) argues that the characteristic role of banks is that they – in order to reduce informational frictions – use fixed-term liabilities to refinance fixed-term lending with a repayment probability that is difficult to assess for outsiders. He also points out that this efficiency enhancing combination at the same time makes banks vulnerable to crisis and creates the need for a lender of last resort.

positors have the same incentive to withdraw, each investor can anticipate that the bank will run out of liquidity. If the bank has to liquidate long-term assets in order to satisfy depositors' demand, this will reduce the expected repayment of a depositor holding on to his claim even further. Thus, information about a misbehavior of the management serves as a signal for depositors to run which eventually forces the fund into default. Assuming that the manager is dismissed in the event of such a crisis and assuming that his benefits from misbehavior in the short-run are overcompensated by expected future benefits from being in office, he will try to avoid a crisis and refrain form moral hazard.

Similar to bank deposits in the argument of Diamond/Rajan (2001), an open-end fund's redemption guarantee serves as an efficient and timely disciplining device. In contrast to other control mechanisms, the liquidity transformation and the associated risk of a run does not presuppose sophisticated investors, who have to monitor the management of the fund – a time-consuming and difficult exercise because of the long-term horizon of investments and the complexities in evaluating real estate assets. Fund managers who anticipate the risk of a run will behave well accordingly, thereby giving investors no reason to run, even though in principle they have an informational advantage with respect to the fund's properties, which they otherwise could use to "hold up" investors.

Given these advantages of the open-end fund construction in terms of disciplining managers, the question arises why open-end real estate funds survived successfully only in Germany. One of the main reasons may be the particular severity of potential conflicts of interest between fund management and fund investors in Germany. As mentioned in Section III., most funds in Germany are originated and owned by investment management companies which themselves are owned by banks, especially universal banks. This is a unique institutional feature of German funds. Since these universal banks do not only own investment management companies managing a variety of different types of funds, but usually hold further business relations with property development companies and property dealers, they may have both the possibility to reshuffle assets at low transaction costs and the incentive to do so. The only effective disciplining device of open-end property funds' investors, consequently, is the option to withdraw funds on a short-term basis and hence to "vote" by feet. However, real returns on properties are uncertain. It is therefore important to also take into account the possibility of return deteriorations that are not caused by misbehavior on the part of the fund's

management. As has been shown by Diamond/Rajan (2000) for the capital structure of bank, in a world with uncertain returns on long-term assets the choice of a pure deposit refinancing might be too rigid.[13] Such a capital structure precipitates runs when real asset values fall even without opportunistic behavior on the part of the bank's management. Diamond/Rajan (2000) argue that it is therefore optimal for banks to partially finance with a softer claim, i.e. equity. Such a soft claim buffers the fund against exogenous shocks to asset values.

Because the open-end fund itself is a special asset pool funded solely by the investors' contributions, a softer capital structure cannot be achieved. Yet, exogenous shocks to the property returns can be smoothed by holding liquidity buffers. Such excess liquidity holdings help to survive situations in which the cash flow from property returns falls short and the available liquidity is therefore insufficient to serve the usual and expected redemption of shares.

In addition, an implicit promise given by the bank-owner to the fund's share holders reduces the risk of runs due to asset deteriorations. Such a guarantee to provide liquidity assistance in an emergency has to be implicit, so that it can be waived in case of misbehavior. Yet, it provides a buffer against smaller shocks to the asset value. Furthermore, it has to be partial, because otherwise the disciplining function of runs and therefore the advantage of the open-end construction would be lost. As a consequence, for larger asset price shocks the risk of fundamental based crises due to asset price deteriorations is still unavoidable.

## *3. Liquidity Crises – The Unintended Consequences of Liquidity Transformation*

As has already become apparent in the previous section, the liquidity transformation of open-end funds makes them fragile and susceptible to severe crises. Particularly the combination with the intertemporal smoothing of property price shocks due to the specific valuation procedure makes these funds vulnerable in times of deteriorating returns from property investments. If the cash flow from real estate investments declines, it becomes more and more difficult for open-end property funds to refinance the usual redemption of shares. Moreover, if property prices

[13] See also *Sebastian/Tyrell* (2006), who analyze the advantages of open-end real estate funds' liquidity risk based on *Allen/Gale* (1998) and come to similar conclusions.

deteriorate, arbitrage opportunities arise due to the staggered evaluation of the funds' properties. After a decline in real estate prices, investors can therefore anticipate a reduction of the redemption rate. Particularly institutional investors who typically face lower transaction costs have an incentive to withdraw their funds shortly before the devaluation in order to reinvest them after the devaluation. The arbitrage profits that they can realize from this strategy, however, absorb liquidity held by the funds.If the liquidity shortage is severe enough, this may force the real estate fund to sell off property below book value, leading to a further reduction of the redemption rate. Consequently, even those investors who initially were not in need of liquidity or who were unable to realize arbitrage profits, eventually have an inventive to withdraw, thereby aggravating the liquidity crisis additionally.

However, apart from these "fundamentally-driven" crises, the liquidity transformation of open-end funds also brings about the risk of self-fulfilling liquidity crisis, i. e. purely expectation-driven collapses. Due to the liquidity transformation the mere anticipation of a sufficiently severe redemption of shares by other investors may lead to the eventual closure of the fund – even if the fund's fundamental value did not deteriorate at all. As shown by Diamond/Rajan (1983) for depository institutions, investors expecting severe withdrawals of funds will also anticipate that the financial intermediary may be forced to sell off long-term assets below book value in order to obtain additional liquidity. Since these "fire sales" reduce future cash flows, investors must also anticipate that the redemption rate will drop, which decreases the value of their claims. Thus, investors expecting a large-scale withdrawal of fund shares have an incentive to redeem their units. Consequently, anticipating a strong amount of withdrawal from other investors, each individual investor will rationally withdraw his money as well, thereby vindicating the initial belief on which his action was based.[14]

Technically speaking, the liquidity transformation function of open-end property funds induces the possibility of multiple equilibria. Depending solely on investors' expectations, there may prevail either an (inefficient) crisis equilibrium or an (efficient) equilibrium, in which the financial intermediary remains stable. Interestingly, this case of mul-

[14] Of course, this mechanism works in both directions, i. e. if an investor believes that other investors are not going to redeem their shares, this reduces his incentive to do so, thereby vindicating his initial belief because his behavior, in turn, reduces other investors' incentives to redeem their shares.

tiple equilibria – of which neither outcome can be predicted with certainty – necessarily requires that investors are aware of the fund's fundamental value lying in an intermediate range of values: the fund's fundamental value may not so sound that the fund will never be closed, irrespective of investors' behavior, nor so bad that the fund will certainly be closed.

One of the main disadvantages of the theory on self-fulfilling crises is its inability to predict which of the two equilibria will be realized. In order to fill this explanatory gap, it has been argued that market participants may coordinate their actions according to so-called sunspots, i. e. unrelated events that may lead investors to believe one of the two outcomes to be more probable than the other. Recent analytical work on coordination games has shown, however, that investors' behavior is not necessarily only influenced by unpredictable sunspots. Rather, their behavior is crucially affected by the structure of information about the fundamental value (in our case, about the fund's assets) that they dispose of. Referring to the results of the literature on "global games"[15], it has been shown that investors' behavior is predictable, i. e. they choose a uniquely optimal strategy even for intermediate fundamental values, if they possess very precise private information, relative to the precision of publicly-available information (Morris/Shin (2002); Metz (2002)). In this respect, public information is defined as pieces of information that are known to all investors and that are known to be known to all investors and so forth.

Hence, provided that investors' private information about the fund is sufficiently precise, the uncertainty stemming from self-fulfilling crises may be avoided. In this case, investors will redeem their shares only if the fund's fundamental value is perceived to be sufficiently bad. In any other case, investors will not be tempted to foreclose their investment only based on the anticipation that others will withdraw. In other words, there will not be a run that – in a self-fulfilling prophecy – leads to a closure of the fund without any fundamental cause. Furthermore, since

[15] In a global game, players observe a noisy private signal about the game's payoff, which itself is determined by a random draw from a given class of games (*Carlsson/Van Damme* (1993)). In the case of open-end property funds, investors do not know their investment's payoff with certainty. Rather, they try to assess the payoff by taking into account any information that may be given to them. Additionally, their behavior itself influences the payoff since the probability of the fund's closure increases in the number of investors that withdraw their money. In this sense, the interaction between investors represents a "coordination game".

the occurrence of a crisis can be predicted in this case, measures may be taken to prevent it.[16]

What can we learn from the theory on global games with regard to the risk of liquidity crises of open-end real estate funds? Due to the very specific nature of investment and the mentioned evaluation complexities, it is certainly difficult for investors to obtain precise private information about the fund's assets. This holds even more for private investors who, compared with institutional investors, lack the financial resources to maintain an own research department. Publicly obtainable information therefore remains very important to bridge the informational gap between the fund's management and, particularly private, investors. If this information is very precise, there is a high risk that an interval arises in which self-fulfilling crises become possible, which may lead to the inefficient closure of a fund, that would still have been viable had only more investors decided not to redeem their shares. If public information is less precise, global games theory predicts a closure of a fund only if the fund's asset values are sufficiently low.

Due to the important role that public information plays, we may state that both the success and the demise of the market for open-end property funds seem to follow self-stabilizing paths. As long as the fund's shares are seen as profitable investments, for instance because of a successful development of the fund's share prices, this anticipation leads to even more capital inflows into the funds, thereby corroborating its stability. If, however, one fund is perceived to be distressed, this may be taken as a negative public signal about the general development of real estate assets, leading to severe outflows of capital, thereby in a contagious process endangering also other open-end property funds. The fact that observations of other funds' success or failure are public information to investors and hence may strongly influence their behavior may both be strengthened or alleviated by the services of public information provi-

[16] Note that a crisis event may still be inefficient, i. e. it might have been prevented had only sufficiently many investors decided not to redeem their shares. The difference to the purely expectations-driven liquidity crises lies in the fact that not all investors choose the same action, i. e. either all redeem their shares or no one does. Rather, the proportion of investors deciding on a withdrawal of money may lie between 0 and 1, but may still be inefficiently high relative to the fundamental value of the fund. These inefficiencies in run-equilibria have also been pointed out by *Rochet/Vives* (2004) and *Goldstein/Pauzner* (2005) for the case of banking crises. However, a self-fulfilling liquidity crises will always be inefficient, a crisis result stemming from a unique equilibrium in a global game does not necessarily have to be inefficient.

ders, such as rating agencies. We will return to this argument in section VI.

As already noted by Diamond/Dybig (1983) an efficient measure to prevent self-fulfilling liquidity crises is the suspension of convertibility of shares. However, this measure automatically cuts the disciplining effect that the full-redemption of shares exerts on the fund's management. As has already been mentioned above, it has to be weighed carefully therefore, which of the two risks is more severe: the risk of management-misbehavior or the probability of a run. In the latter case, we additionally have to distinguish between a fundamentally-caused liquidity crisis leading to the efficient closure of the fund, or a self-fulfilling crisis resulting in the closure of an otherwise viable fund. This distinction will be taken up again in the next section that describes the closure of the first open-end real estate fund in Germany, Deutsche Bank's Grundbesitz Invest.

## V. The Trigger of the Open-End Property Funds Crisis in Germany

Following the declining yields on commercial real estate in Germany many open-end property funds came under pressure in 2004 and 2005. In several cases, the banks holding the respective investment management companies stepped in to provide liquidity and buffered a devaluation of the redemption rate. Prominent examples were Deka Bank, HypoVereinsbank, and Commerzbank.

In contrast, on December 11, 2005, Deutsche Bank announced that due to property price developments an unscheduled evaluation of its biggest ($ 7.2 billion) real estate fund, Grundbesitz Invest, was unavoidable and would very likely lead to a devaluation of the redemption price. The following severe withdrawal of funds absorbed most of the fund's liquidity and forced Deutsche Bank to freeze redemption and close the fund until further notice. At first sight, the troubles of Grundbesitz Invest looked like a typical fundamentally-caused crisis, stemming from overvalued assets.

After the closure of the fund, the general problems of the German real estate funds industry were analyzed extensively in public. Despite the general awareness that the biggest flaw of open-end real estate funds lies in their promise of immediate liquidity to investors while being tied-up in illiquid assets, the public wondered why Deutsche Bank announced the freezing of its fund without any obvious cause. Due to the staggered

valuation process, a substantial part of the fund's assets had undergone a thorough evaluation just recently. Without any exogenous event suggesting a severe shock to the value of the fund's assets, liquidity transformation should not have been much of a problem. Even more surprising was Deutsche Bank's announcement of not taking the usual steps of using own resources to secure the fund – especially since there were signs that the commercial real estate market was already improving at the time. Instead, Deutsche Bank simply offered a fair compensation to a sub-group of investors (that had invested in the fund within the last two years), not even to all investors.

This behavior stood in stark contrast, for instance, to the way Deka Bank, a large investment branch of German savings banks, had handled the distress of its own open-end property fund a year earlier. As was usual for the banking industry in Germany, Deka bailed out its fund by buying sufficiently many of the distressed shares. Obviously, Deutsche Bank had reasons for choosing to behave differently. Rumors were abound that Deutsche Bank was pushing for a governmental approval to create exchange-traded real estate investment trusts (REITS) as a new investment product and, therefore, did not care too much about the prospects of open-end property funds.

The difference in behavior between Deka Bank and Deutsche Bank may be ascribed to the trade-off between maximization of reputational capital at the expense of financial capital, and vice versa, that has been emphasized by Boot/Greenbaum/Thakor (1993). Whereas Deka Bank obviously chose to preserve the reputational capital of its own open-end property fund by bailing it out, Deutsche Bank decided on the opposite strategy. As Deutsche Bank seemed not to have much interest in the development of its open-end property funds market, it did not value reputational capital in that segment very much. Moreover, this difference in priorities may also be explained by the different corporate governance of the two banks. While Deutsche Bank's diverse international shareholders are efficiently enforcing profit maximization, the public ownership might provide Deka Bank with a fairly long-term horizon for efficiency considerations.

Apart from the aspect of how Deutsche Bank behaved after the onset of the crisis as compared to Deka Bank, there remains the question of whether the closure of Deutsche Bank's Grundinvest fund was truly triggered by fundamental causes. It may be answered with the help of the above mentioned theory of self-fulfilling crises versus a unique crisis outcome in the global games theory. If the theory of multiple equilibria –

and hence of self-fulfilling crises – holds, the fund's demise took place within a rather uncertain market where a sunspot-event decided on the realization of the closure of the fund. According to global games theory, in contrast, the fund's freeze was the outcome of a unique equilibrium and had to be expected with certainty once the value of the underlying assets became known. Only in this respect could the crisis correctly be referred to as a fundamental-driven event.

In order to distinguish between the two theories, it is intriguing to examine more closely the information available to the market at the time the crisis happened. It might have been the case that the announcement of a revaluation of the fund's assets proved to be a sufficiently precise public signal to the market that the conditions for a self-fulfilling crisis were satisfied, without the fund itself being of sufficiently low quality to warrant a "fundamental crisis". If this explanation holds, investors withdrew their money solely because they expected others to do so as well and not because they believed the fund's fundamental value to be sufficiently low. Hence, they coordinated on the inefficient action within a range of fundamental values where the efficient continuation of the fund would still have been possible. According to global games theory, in contrast, the observed closure of Grundbesitz Invest presents a fundamental crisis because investors held sufficiently precise private information about the fund that convinced them of the low value of the fund's assets. However, since finally after the reevaluation period the redemption price of Grundbesitz Invest shares was only reduced by 2.4 % when the fund was opened again on March 3rd, one may seriously doubt that the crisis was indeed driven by private information about a fundamental weakness of the fund.

## VI. Systemic Repercussions of Individual Crises and the Role of Information

From a regulatory perspective the welfare implications of an individual open-end real estate fund being in a crisis – even if it is as large as Deutsche Bank's Grundbesitz Invest – are negligible. Of far greater importance are the negative repercussions that the closure of such an individual fund has on the entire industry. In several ways the crisis of an individual institute can affect the stability of others, potentially leading to a collapse of the entire industry.

A "fundamental" way of how an individual crisis may cause contagious effects is through its influence on real estate prices. In reaction to the li-

quidity shortage, the troubled fund has to sell off large parts of its real estate portfolio. This absorbs liquidity from the real estate market and depresses property prices. Similar to the channel of financial contagion in the banking sector pointed out by Allen/Gale (2004) and Fecht (2004), this may trigger liquidity crises of other funds, since at each point in time some funds plan to raise liquidity in the market by selling parts of their real estate portfolio. Given a severe drop in property prices, they will not be able to raise the expected amount of liquidity from these transactions. This might cause a liquidity shortage at these initially solid funds and induce them to sell off additional assets, which creates a further downward pressure on real estate prices.

A probably even more important self-enforcing mechanism leading to contagious effects on other initially sound institutes may be induced by the effect of real estate market prices on investors' arbitrage opportunities. As has already been noted in pervious sections, due to the staggered evaluation procedure the redemption price adapts slowly to declines in property prices. Thus, investors observing a price decline can anticipate a reduction in the redemption rate and realize arbitrage profits by withdrawing shortly before and reinvesting shortly after the devaluation. As the arbitrage profits of investors absorb funds' liquidity, it may even force previously stable funds to sell off property below book value to gather additional liquidity. Anticipating this effect, even those investors who are unable to benefit from the arbitrage opportunity have an incentive to withdraw on a large scale. Indeed, these effects have been emphasized by many practitioners who also pointed to the comparably illiquid and concentrated market for commercial real estate in Germany which makes these spill-overs through asset prices a particularly relevant phenomenon.[17]

But given the difficulties of private investors in assessing the development of the fundamental value of real estate funds, "informational" spill-overs of an individual fund's collapse might have even more severe repercussions on other funds: Due to the opacity of real estate funds' assets, investors dispose of only imprecise assessments of future returns and default probabilities of individual funds. However, given that the portfolio structures of different real estate funds are in general very much alike, investors know that it is rather unlikely that a shock affects

[17] For instance, T. Vorwerk from Südprojekt, an independent rating agency, and M. Rothe from Standard & Poor's raised these concerns during the crisis of Deutsche Bank Grundbesitz Invest (Handelsblatt, January 1st, 2006).

only a single institution. Thus, the collapse of one real estate fund serves as an indicator for investors holding shares of other real estate funds. Consequently, observing that one fund is unable to redeem its shares, other funds' shareholders trying to extract information from this observation will revise their expectations about the soundness of their fund, which might increase their incentive to withdraw. Because of the liquidity insurance that open-end real estate funds offer, unexpected large-scale withdrawals can trigger a self-fulfilling liquidity crisis. Even sound real estate funds might collapse simply due to the erroneous change in investors' sentiment following the crisis of an individual fund. Thus, – similar to the mechanism emphasized by Chen (1999) with regard to banking crises – the collapse of an individual fund can trigger informational contagion of large parts of a fundamentally sound industry.

In contrast to this endogenous source of information, exogenous providers of information, such as rating agencies, deliver accurate fundamental information about individual funds' business perspectives to the public and hence perform a valuable task in reducing the informational asymmetry between funds and investors. However, whether or not they make the investment decision of shareholders more efficient remains an open question. On the one hand, they may reduce the sensitivity of investors to the fragility of other funds. Disposing of more precise information about each individual fund, investors may rely to a lower extent on the information that they extract from the observed collapse of one fund with regard to the stability of other real estate funds. Consequently, by diminishing information asymmetries, rating agencies may substantially reduce the risk of informational contagion between open-end real estate funds. Relying on the results of global games theory, however, this finding only holds if the rating information does not become common knowledge among all investors. In the context of real estate funds, this may be a reasonable assumption, since the market for property fund ratings is rather fragmented, and, unlike the market for credit ratings, is not divided among the "Big Three" agencies (Moody's, Standard & Poor's and Fitch). Moreover, as fund-ratings are not publicly announced but usually sold to subscribers, a public dissemination of their content, for instance in the newspapers, will solely follow an extreme rating assessment that naturally leads to a response in the financial press.

If, however, the rating information does become common knowledge, the rating's effect may be similar to the impact that credit rating agencies have been found to have on firms issuing debt. Focussing solely on

the coordinating role of ratings due to their high degree of publicity (in credit markets), Boot/Milbourn/Schmeits (2006) have shown that the existence of a rating agency may lead to a reduction of uncertainty in investment behavior, as it becomes easier for investors to anticipate the aggregate market outcome. In their model, the existence of a rating agency therefore contributes to the prevalence of a unique equilibrium. However, as Carlson/Hale (2005) show, ratings do not only coordinate behavior but also bring new informational content to the market. They conclude that by simultaneously fulfilling both a coordination and an information function, rating agencies may increase market uncertainty as multiple equilibria become more likely. Both papers, however, lack a proper utility function for the rating agencies and simply assume that they always try to generate a rating that reproduces the unknown credit quality as precisely as possible, thereby maximizing the agencies' reputation.

In a recent paper, Bannier/Tyrell (2005) show that these earlier results do not necessarily hold if a more complex utility function for a rating agency is introduced. In particular, they assume that a rating agency not only tries to maximize her reputation but also has to take into account competitive pressures from other information providers and has to account for a potential feedback effect of her rating on the credit quality of the rated firm. These arguments seem to hold for the ratings of property funds as well. In the real estate market, competition between rating agencies is particularly fierce as market entry is not as strictly regulated as in the market for credit-ratings. Due to strong complementarities in investors' behavior following from the liquidity transformation function that open-end property funds offer, potential feedback effects from a fund's rating on its liquidity situation and hence on its future business prospects are particularly obvious.

As has been shown by Bannier/Tyrell (2005), rating agencies that generate ratings taking into account the above-mentioned utility arguments may potentially but do not necessarily increase market uncertainties. While a rating announcement automatically increases the precision of public information on the market and hence raises the risk of self-fulfilling crises, these may be prevented if investors have access to sufficiently precise private information. However, as has already been mentioned, for the case of open-end property funds this possibility is limited at least for private investors who were the main target group for these funds. In this market, therefore, the existence of ratings, provided that they become common information to all investors, may reasonably increase market

uncertainty and trigger inefficient fund closures. The more precise the rating, the easier it becomes for investors to coordinate their actions, which increases the effect. This result is strengthened by an interesting feature of fund ratings. While usually ratings simply assess the quality of the fund's underlying assets on a relative scale, there are ratings that additionally combine this quality assessment with a sell, hold or buy recommendation. The latter combined type of ratings will certainly ease investors' coordination based on the published rating, as such increasing the risk of self-fulfilling crises.

An additional result by Bannier/Tyrell (2005) refers to the impact that the market segregation between private and institutional investors has on a rating's influence. Usually, institutional investors are required to invest only in assets or funds that are perceived to be sound, i.e. in "investment grade" assets or "mündelsichere Anlagen". These investment constraints for institutional investors can be shown to increase the probability of a crisis, i.e. of an inefficient mass withdrawal of money, where the effect is strengthened by the relative size of their investment.

## VII. The Spread of the Crisis in Germany

Indeed the closure of Deutsche Bank's Grundbesitz Invest caused a widespread crisis in the market for open-end property funds in Germany, supporting the considerations of the previous section. Particularly interesting was the evolvement of rating agencies in this respect.

The closure of Deutsche Bank's Grundsbesitz Invest apparently raised doubts about the stability of German open-end real estate funds in general and the question of whether German banks will generally continue their practice of providing liquidity assistance to distressed property funds. The wide spread credibility crisis of the open-end property fund industry is best illustrated by figure 1 presenting the monthly net liquidity inflows at German-based public open-end real estate funds from January 1995 to December 2005. Obviously, in December 2005 and January 2006 the funds faced a liquidity drain on a previously unprecedented scale. The liquidity outflow in the month of December 2005 to February 2006 amounted to Euro 8.5 bil–more than 10 % of the total assets under management of these open-end property funds.

However, the timely announcements of several banks to provide liquidity to their open-end property funds in the event of a shortage restored credibility and prevented a large scale closure of other funds.

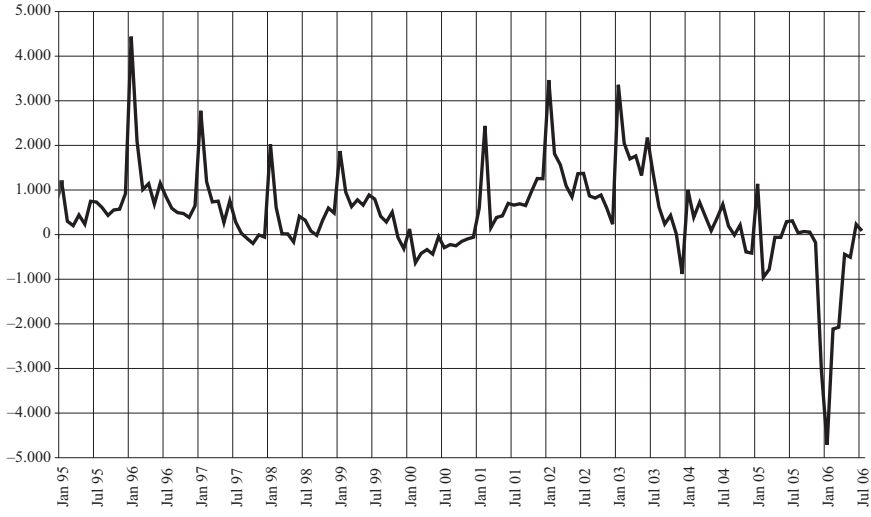


*Figure 1: Monthly Net Liquidity Inflow to Public Open-end Real Estate Funds in Germany (in Mio Euro)*

This was different in the case of KanAm, an investment management company that manages two German based open-end property fund and is not owned by a bank. On January 9, 2006, Alexandra Merz, managing director of Scope Analysis, a Berlin rating agency, stated in Business Week that after the closure of the Deutsche Bank fund, the closure of a second fund might trigger a run on open-end property funds. Despite the perceived risk of any additional negative information about the real-estate fund industry, Scope issued rating downgrades on two open-end property funds by KanAm on January 16, 2006. Both rating announcements were combined with a sell-recommendation. Interestingly, the rating downgrades were not triggered by the announcement of a revaluation of assets by the funds' management. Rather, Scope argued that a downgrade had become necessary due to rumours about The Mills Corporation, one of KanAm's partners in the US real estate market. Despite the fact that even a full default of The Mills would only have minor effects on KanAm's assets, Scope argued that negative reports about The Mills might trigger liquidity outflows from KanAm's funds that warrant a downgrade even of KanAm Grundinvest, a fund that is not invested in US real estate, due to infection effects between the funds.

KanAm responded to the rating downgrades by pointing out that Scope had not obtained any data on the fund's assets from the fund's management, while a rating by Feri, a rating agency based in Bad Homburg, only slightly earlier had announced an excellent rating (AA) based on thorough private information about the fund. While the lack of proprietary information usually leads a rating agency to dispense with a rating, Scope decided to come forward with an assessment nonetheless. As Alexandra Merz later argued, Scope was in a dilemma: either not to announce its knowledge about the negative information about The Mills, risking not to be seen as a reliable source of information if the public learned about the presumably deteriorating quality of KanAm's partner, or to announce a negative assessment about KanAm's funds, thereby risking to act as a "multiplier", leading to a self-fulfilling prophecy. The latter is exactly what happened. Due to severe liquidity outflows, KanAm announced the freezing of its US fund on January 17, 2006. Two days later, KanAm also had to close the much bigger KanAm Grundinvest fund.

Combining the demise of the KanAm funds with the closure of Deutsche Bank's Grundbesitz Invest, we find that the former was definitively not triggered by fundamental reasons. In particular, KanAm US-Grundinvest was the most successful open-end property fund in Germany at the time. It stands to reason therefore, which role the publication of the negative rating assessments played for the observed development of KanAm's funds. The fact that the Scope ratings were combined with a sell recommendation – a rather unusual proceeding – certainly contributed to the high perceived precision of this piece of public information.

This perception of a high precision of public information about the KanAm funds' quality might exactly have been what triggered the crisis. As the KanAm funds did not seem to be in a range where a crisis was inevitable, an interval might have opened up where self-fulfilling crises became possible. Since it is hardly possible to obtain any precise private information about the investments of real-estate funds, the perceived increase in public information precision due to the rating announcement might reasonably have triggered the possibility of multiple equilibria. Within the interval where self-fulfilling prophecies decide on the market outcome, Scope's negative information coordinated investors on the inefficient decision to withdraw their money, which forced the closure of the fund. Obviously, therefore, investors overreacted to the negative rating that was publicly available rather than searched for additional sources

of private information. This overreaction reflects the dual role that public information seems to play on financial markets due to strategic complementarities in investors' decisions. On the one hand, it conveys informational content, on the other hand, however, it also coordinates investors' behavior. As long as public information is sufficiently accurate, the latter effect might not distort the market outcome away from the efficient action that investors would have chosen had they perfectly known the true fundamental value underlying the fund. However, if public information is incorrect, it may coordinate behavior towards an inefficient market outcome. In the case of Scope's rating, information was certainly not very accurate as it was only based on rumours and publicly available pieces of information and not on a thorough analysis of the funds' data, even though it might have been perceived to be quite precise as it was combined with a straightforward trade recommendation. The results were aggravated by the fact that in particular institutional investors seem to have been heavily invested in KanAm's funds and massively withdrew their money after the rating announcement. Certainly this contributed to further withdrawals also by private investors that finally led to the closure of the funds.

## VIII. Policy Recommendations

After the troubles of open-end property funds in Germany in December 2005 and January 2006, different measures were recommended to improve the situation of these funds. Policy recommendations mainly concentrated on three different aspects: liquidity control, valuation and transparency of funds.[18] Our analysis of the different functions and the operational risk of open-end real estate funds allows us to evaluate most of these recommendations in detail.

With regard to the control of liquidity, funds have been recommended to increase the level of their liquidity reserves, to introduce a period of notice for large sales (above one Mill. EUR) of the fund's shares combined with a discount on the redemption of shares from institutional investors, to allow for transactions between various funds owned by one company and to support the public trading of shares on a public exchange once a fund is closed. According to the logic that we followed in section IV.2. of this paper, an increase in liquidity requirements for real

[18] On January 24, 2006, BVI published a whole package of measures believed to be necessary to improve the funds' operations.

estate funds should be seen as counterproductive. It not only reduces the returns that these funds can generate, but it also undermines the disciplining effect of liquidity risk on the fund's management. However, larger liquidity buffers may alleviate the risk of a run on the fund: Higher liquidity reserves will reduce the trigger of the fund's perceived value up to which investors will decide to sell their shares.

A discount on the redemption of large shares, i. e. from institutional investors, should be efficiency enhancing because the liquidity transformation provided to investors can be improved (Diamond (1997)). Additionally, this measure strengthens the incentive of institutional market participants to invest in monitoring of the fund, because they cannot rely on withdrawing before small investors do. Most importantly, the discount also limits the scope for arbitrage opportunities for institutional investors in anticipation of a devaluation of the redemption rate.

Finally, the closure of a fund may only be efficiency enhancing if management is dismissed. Otherwise, the suspension of convertibility of shares into money or the creation of a mutual insurance system eliminate the disciplining effect of liquidity transformation. These measures might be counterproductive if they reduce financial fragility, which is necessary for giving the right behavioral incentives in a complex institutional financial environment like Germany, by too much. While a trade of shares on public exchanges in the case of a closure of the fund should solve this problem, it has been found that the few burses that allowed for trading of open-end property funds stopped trading once the funds themselves were closed.

Regarding the frequency of evaluation the proposals recommend a shortening of the period in which each unit has to be assessed to 6 month. With regard to the question of how to evaluate the funds' assets, policy recommendations ask for a stronger emphasis of a market-based evaluation. Up to now, due to the staggered valuation process, individual assets are evaluated not very frequently. Most of a fund's assets hence enter the evaluation process with an outdated price that is closer to historical costs than to the present market values. Interestingly, recent research by Freixas/Tsomocos (2004) and Plantin/Sapra/Shin (2005) comes to the conclusion that under certain conditions, "book values" might be much better suited to evaluate assets than "fair values". Even though the papers depart from different assumptions about the underlying market structure, both reflect the working of open-end property funds reasonably well. While Freixas/Tsomocos (2004) argue that book value account-

ing is preferable if the evaluated entity is supposed to smooth intertemporal consumption, Plantin/Sapra/Shin (2005) find that this is true if the secondary market for the asset is relatively illiquid and claims are long-lived. Obviously, it will be important to reduce the volatility of the fund's value by not allowing for additional variability brought about by frequent changes due to a marking-to-market evaluation program. However, while a shortening of the evaluation period and a stronger orientation on current market prices limits the scope of open-end property funds to provide intertemporal smoothing it also limits at the same time arbitrage opportunities that arise due to temporary deviations of the redemption price from the fundamental value of the funds' assets.

Yet, shorter evaluation periods and a higher emphasis on market prices also increases the transparency of a fund's fundamental value. Similarly, the proposed increase in the independence of evaluation experts by forcing funds to change the appointed expert every two years should improve transparency. Better information about the fundamental value of each individual real estate fund reduces the risk of informational contagion since investors to a lesser extent rely on information that they extract from another fund's failure. In addition, greater transparency should also enable investors to exert direct control on the funds management. This would reduce the need for a fragile capital structure that enables investors to vote by feet in case of a bad fund performance.

An additional way to improve transparency is to foster the rating of open-end real estate fund. Particularly solicited ratings might be an efficient way to reduce the risk of informational contagion and improve investors' control of fund managers. But whenever a rating agency does not have access to private information about the fund, as has been the case for Scope's KanAm rating, the rating will only display a coordination function, which raises the risk of a liquidity crisis for the fund. Thus, in contrast to solicited ratings, unsolicited ratings might actually increase the fragility of open-end property funds.

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## Summary

### Open-End Real Estate Funds in Germany – Genesis and Crisis

Open-end real estate funds are of particular importance in the German bank-dominated financial system. However, recently the German open-end fund industry came under severe distress which triggered a broad discussion of required regulatory interventions. This paper gives a detailed description of the institutional structure of these funds and of the events that led to the crisis. Furthermore, it applies recent banking theory to open-end real estate funds in order to understand why the open-end fund structure was so prevalent in Germany. Based on these theoretical insights we evaluate the various policy recommendation that have been raised. (JEL G14, G21, G23)

## Zusammenfassung

### Offene Immobilienfonds in Deutschland – Ursprung und Krise

Offene Immobilienfonds sind für das deutsche, bank-dominierte Finanzsystem von besonderer Bedeutung. Die kürzlich beobachteten Schwierigkeiten einiger dieser Fonds lösten jedoch eine breite Debatte bezüglich der Notwendigkeit regulatorischer Eingriffe aus. Ziel dieser Arbeit ist eine detaillierte Beschreibung der institutionellen Struktur der offenen Immobilienfonds in Deutschland sowie der Ereignisse, die zu der beobachteten Krise führten. Gestützt auf Analysen der modernen Banktheorie wird erklärt, warum gerade in Deutschland offene Immobilienfonds eine wichtige Rolle spielen. Basierend auf den theoretischen Erkenntnissen werden die verschiedenen, in der Öffentlichkeit diskutierten Politikempfehlungen evaluiert.