

German Open Ended Real Estate Fund Performance – The Impact of Liquidity

By Michael Stein¹, Essen

I. Introduction

German Open-Ended Real Estate funds (GOEREFs hereafter) have undergone an industry-changing phase of suspensions of fund share redemptions in the recent financial market crisis. Funds not being integrated into own distribution networks were most affected by the negative fund flows that occurred in recent years, which resulted in suspensions of redemptions when liquidity ratios dropped below critical and/or regulatory minimum levels. This removed the daily liquidity of the funds that investors had been used to in the years before, causing a severe mismatch in the liquidity of target assets of the funds and their own (possible) fund flows. The wave of suspensions and failed re-openings during the recent financial market turmoil has resulted in a new regulation and – in many cases forced – announcements of many asset management companies to wind up their funds within given time spans in the years to come. Notably, with total assets under management of €83bn as of October 2012, GOEREFs are still a significant portion of the German and European real estate investment and asset management landscape². About a fourth of that €83bn is held by funds that are gated or in termination, i.e., €22bn. The current assets under management of the industry are very near the peak of about €86bn that was reached about four years ago, as the reduction was bounded by the suspension of shares and new funds

¹ The author would like to thank Stephan Brünner for his helpful comments, Robin Borchering for providing excellent research assistance, and one anonymous referee for comments that helped to substantially improve the paper. Help with data problems by Bloomberg representatives and various fund management companies is gratefully acknowledged. The author is responsible for remaining errors.

² For general descriptions of GOEREFs and the related industry see *Maurer* (2004), *Bannier et al.* (2008) and *Sebastian/Strohsal* (2011) among others.

were still incepted – with some funds still being able to achieve moderate growth.

This study turns the focus onto the performance of GOEREFs, thereby taking into account the liquidity problems in the recent past: given that a fund has suspended redemptions of shares, the only way to sell the shares that are held is through the secondary market. While the fund exchange market for GOEREFs in Germany is still relatively immature and liquidity is limited, nevertheless substantial amounts have been traded. For example, SEB Immoinvest and Credit Suisse Euroreal, two of the largest funds in the sample each with about €6bn of assets under management still in 2012, were both traded with volumes exceeding €1bn from October 2008 until October 2012.

Both private investors and institutional investors, such as funds of funds, pension funds, wealth managers and private banks, were and are invested in GOEREFs, and some of them used the fund exchange as a means to remove their positions in (temporarily) illiquid funds off their savings accounts or balance sheets. Of course, this liquidity provided by the secondary market is no free lunch: shares trade well below the Net Asset Value (NAV hereafter) that is reported on a daily basis by the respective fund companies. Discounts stem from both the uncertainty on when and whether the fund under consideration will be open for redemptions again (liquidity discount) and from the uncertainty regarding the reliability of the reported NAV (expected performance discount).

For years and decades the reliability of NAV was of no problem at all. However, in recent years several examples of tremendous re-valuations of property and drops in NAV for some funds – and especially for those being gated – induced a substantial problem of shareholder trust regarding the expected performance of GOEREFs. On the other side of the trades, the secondary market may be used by investors willing to buy assets at lower prices, speculating that the respective funds will either reopen and shares may be redeemed at NAV or the NAV in the case of a fund termination will still be above the current price on the fund exchange.

In order to take into account that in some periods the NAV may not be touched and liquidity is only available at a discounted price on the secondary market, analyzing performance changes during the recent crisis needs to be done by using both the NAVs reported by the fund management companies and the secondary market prices. Before explaining the

methodology in section 3, the nature of GOEREFs is discussed in the next section, along with a review of both the history and the statistics of the respective funds. Results using a complete data-set of available GOEREFs are presented in section 4. Conclusions are drawn in section 5, along with an outlook with respect to the relevant findings.

II. German Open-Ended Real Estate Funds

1. The History of GOEREFs

GOEREFs have been part of the fund landscape since the 1950s. A reliable regulatory framework has existed from 1969 onward, with some of the most popular and largest funds existing since the 1970s. Most of the growth however took place after the European Monetary Union, which greatly enlarged the investment possibilities without incurring currency risks. During the last decade, the GOEREF landscape successively gained market share in the European real estate industry. However, with the financial market crisis emerging and finally having its impact on the otherwise largely unaffected GOEREF industry, the German government's guarantee of bank savings fuelled the negative fund flows in several funds that started during 2008 as many investors substituted their GOEREF investments with bank savings. There was a substantial problem of self-fulfilling prophecies in the market, when news of negative fund flows surfaced, leading to fears of deteriorating liquidity ratios in the funds and subsequently even increased outflows. Those problems caused massive withdrawals of money mentioned in the introductory section, igniting the series of redemption suspensions, failed re-openings and announcements of fund terminations.

2. Structure and Legislation of GOEREFs

Understanding the very nature of GOEREFs and the associated liquidity and performance problems is crucial in light of this study, and therefore an overview of the funds and their characteristics is due. According to German investment law, this special type of open-ended fund must invest directly in property, and most funds focus on commercial real estate. As with U.S. open-ended funds (mutual funds), the funds issue shares at net asset value, that is, there is in general no premium or discount observable as in the case of a closed-end fund. Under the old law,

redemptions are also possible at net asset value on every trading day. Daily net asset values of the funds are determined via rents received, re-valuations of property held (normally once per year for each building), sales and acquisitions of properties, and on costs and fees (from property management, consulting services, construction and refurbishments for example). In addition, the funds need to hold large amounts of liquidity (mainly cash, overnight money and very conservative bond investments), because of the mismatch of their investments in very illiquid assets and the daily fund inflows and outflows. As mentioned, and being the crucial factor in the GOEREF crisis, this became impossible when investors began to withdraw large amounts of money by redeeming their shares beginning in 2008.

Both legislative and supervisory entities and the fund companies' association BVI aimed at salvation for the GOEREFs, resulting in the new regulation which became effective as of April 8th 2011. According to the new law, GOEREFs underwent a decisive change of structure. The new law aims at preventing further redemption suspensions and is clearly protecting the retail investor base over the institutional investor base, legally underpinning the long-term investment nature of GOEREFs and the focus on retail investors and savers. The fund management association in particular claims that mainly institutional money flows are responsible for causing the liquidity problem in GOEREFs. The new law introduces minimum holding periods of 24 months coupled with announcement periods of 12 months for redemptions above € 30,000 per half-year. This maintains daily liquidity for small redemptions, given investment for at least two years³.

The holding restriction is applicable to new investors only, but the notice period is applicable to all investors following adoption of the law by the respective fund companies. Although investors can redeem shares after 24 months given that they announced it at least 12 months in advance (for large redemptions), the new regulation makes investments into GOEREFs considerably more difficult for institutional investors. This

³ It is expected that there will be more legislative changes in 2013, as the EU Directive on Alternative Investment Fund Managers (AIFM) will probably lead to further adjustments. As of autumn 2012, the expected structure that is discussed is that redemptions will be possible four times per year on fixed dates along with mandatory pre-announcements, and that shares can be bought once a year. This new structure could foresee that new real estate funds will only be incepted with closed funds structures.

applies especially to those institutional investors being exposed to fluctuations in their own investment volume in general – like, for example, funds of funds, wealth management entities and discretionary mandate managers – and to possible outflows in particular.

As redemptions of held fund shares will not be possible on short notice after funds have adopted the new law (latest on 31st December 2012), selling of shares can be done only via pre-announced redemptions, or on the secondary market. Accordingly, the secondary market is expected to be the market to trade fund shares after they have adopted the new law, as it is currently for funds closed for redemptions. However, the new law did not prevent most of the gated funds from having to prolong the suspensions and/or announce termination of funds.

3. *Valuation and Return Characteristics*

Another specialty of the German funds is also worth a discussion: the valuation principles. Due to the German practice of valuation, changes in property values were small and provided a very stable and smooth performance pattern over time. This was the result of appraisers' practice of basing the valuations on the long-term expected rents to be received (a long-term sustainable rental income method) when holding the property and was in contrast with mark-to-market oriented valuation methods seen in many other jurisdictions. Real estate valuation principles in Germany have been discussed in detail in the past by *Downie et al.* (1996) and *McParland et al.* (2002) for example.

Comparable to other appraisal-based real estate price and return series, GOEREFs are exposed to the effects of appraisal-smoothing as initially discussed by *Geltner* (1991) and followed up by *Clayton et al.* (2001), *Geltner et al.* (2003) and *Edelstein/Quan* (2006) among others. Especially for large portfolios, the smoothing effect of the valuation is even greater because assets' re-valuation is distributed over the year, rather than taking place at one time for all properties held. For those reasons, until 2008 the GOEREFs typically exhibited a very stable and non-volatile price pattern over time, mainly achieving 3 % to 7 % annually with very low volatility. This has been documented in detail by *Maurer et al.* (2004a), while *Maurer et al.* (2004b) focussed on the return characteristics of German real estate in an index context. However, in the recent past several funds had to cope with devaluations of property

and in some cases fund NAV dropped by more than 10 %, a considerable hit regarding normal returns of about 5 % per annum. This raises the question as to whether and how the valuation principles were still fully reflected in the valuations of property held by funds closed for redemptions, as there is anecdotal evidence that those were priced differently.

Notably, not only are differences in performance between open and gated funds evident, but one might raise the question why NAVs were stable throughout any type of economic environment and real estate market cycles in previous decades, and now appear to be more sensitive. If simply the less volatile German market prices were suspected to be the answer, increased investment activity abroad would be a tempting explanation. Unfortunately, this is not necessarily a satisfying conclusion given the fact that valuation is still done by German appraisers according to the principles explained above. Accordingly, macroeconomic and fundamental changes are expected to have minor influence, while in turn one might see a change in the sensitivity to those. However, investigating possible performance changes in NAV due to changed valuations or sensitivities to external factors is beyond the scope and aim of this study.

While the study does not focus on whether and how the drops in NAV occurred, another problem with the prices of the GOEREFs is at the core of the investigation: when funds are closed for redemption, shares held can only be sold on the secondary market. As mentioned in the introduction, this comes at a cost-which may be higher than the total returns obtained in the preceding years.

4. All GOEREFs and Their Classifications

Tables 1 and 2 provide all relevant information on GOEREFs, where to the author's knowledge this sample is complete in the sense that all historic and existing funds are included. Some of those do not appear in the statistics published by the fund management association BVI, as not every respective management company for a fund is a member of the association⁴. It can be seen that the funds can be divided into classes of funds

⁴ Furthermore, the sample covers more funds than IPD's OFIX Index and Bloomberg's BAIF-Open End Real Estate Fund Index. The universe of funds is also a little different, as the latter contains Austrian funds as well.

depending on their investor base: first, retail funds are generally targeting small private investors and savers. Second, retail funds that are exclusive to clients of the respective cooperative savings banks running the funds through their own asset management companies. Those funds can be bought only by investors having a savings account with the cooperative savings bank offering the fund⁵. The third class of funds are the so-called institutional or semi-institutional funds (institutional in the following) which are open to institutional investors and wealthy private investors. Those funds typically impose a minimum investment amount which must be exceeded to be eligible for buying shares. Some of those funds make use of holding period agreements as extensions to the general sales offer sheets, where investors have to lock in for several years to get the full amount of money back when redeeming their shares. Otherwise, they have to accept reductions to the NAV. Those holding-period redemption fees are often coupled with announcement periods. However, even this mechanism did not provide all of the institutional funds with the targeted safety of fund volumes and some of them had to suspend redemptions or even announce termination in addition.

III. Methodology and Data-Building Performance Indexes

1. *Idea of the Relevant Price*

In recent years identifying the performance of the industry became a more challenging task. Not only did NAVs exhibit increased volatility and performance drops occur more often, the choice of the relevant price brought in new complexity. Even if NAVs are stable, those cannot be “touched” for funds that are closed for redemptions. Institutional investors in particular needed to focus on this problem, as they had to choose between the NAV or the secondary market price when reporting their performance. Although the crisis was going on for several years from 2008, official recommendations and/or legislation communications were scarce. The fund management companies association BVI distributed a note by the regulator BaFin in 2011, where a legal notion of choice

⁵ Sometimes shares of the cooperative saving banks’ funds can be bought on the secondary market as well, and therefore may even be bought by institutional investors. However, as normally only cooperative savings bank clients can buy the shares, trading is very limited and not regular. However, those shares even trade at a premium if any trading is done.

regarding the relevant price was given. According to this, investors may either take the NAV or the secondary market price when accounting is done for funds that are closed for redemptions⁶.

For this study, where the most relevant performance is to be identified and reported, the best choice is to use the price that may be obtained each day. This is due to the aim of identifying the performance that may be realized, i.e., a performance that also reflects the liquidity situation. Accordingly, when funds are open for redemption, the net asset value is used as the relevant price. When a fund is gated, the secondary market price is used, as this is the price that is directly achievable⁷ and the relevant price at time t is a function of the net asset value, NAV_t and the secondary market price P_t^{sec} with $s_t = 1$ for days where redemptions to the fund company are suspended and $s_t = 0$ otherwise:

$$(1) \quad P_t^{rel} = NAV_t \cdot (1 - S_t) + P_t^{sec}(S_t)$$

This ensures that for each day, only the price that may be realized is used to calculate the performance. In this sense, the methodology may be seen as reflective of prices that are corrected for liquidity, with no assumption on whether the suspension will end before positions must be terminated. Considering that the investors of the funds may be exposed to changes in their own liquidity and need to accordingly shift their positions in investment targets⁸, this provides a very viable picture of fund performance.

From equation (1) above, it is easy to see that the relevant daily returns R_t^{rel} take the following form:

⁶ Given this, institutional investors were left with their own judgment and the discussion with their respective auditors for a considerable period of time. The information letter is available from the author upon request.

⁷ Inherent is the assumption that the reported price on the secondary market would be realized for the chosen lot size of a possible sale, i.e., that the price would be viable for the amount to be traded. Then liquidity is given at the observed price and one assumes that either the bid-ask spread will remain the same for larger trades or selling is done in comparable amounts.

⁸ See Stein (2011) and Stein/Rachev (2011) for an overview of how discounts may factor into performance when positions must be closed due to liquidity fluctuations, the latter being an application to the GOEREF industry.

$$\begin{aligned}
 R_t^{rel} &= \frac{P_t^{rel} - P_{t-1}^{rel}}{P_{t-1}^{rel}} \\
 (2) \quad &= \frac{[NAV_t \cdot (1 - S_t) + P_t^{sec} \cdot (S_t)] - [NAV_{t-1} \cdot (1 - S_{t-1}) + P_{t-1}^{sec} \cdot (S_{t-1})]}{NAV_{t-1} \cdot (1 - S_{t-1}) + P_{t-1}^{sec} \cdot (S_{t-1})}
 \end{aligned}$$

The formulas for the relevant price and relevant return make the problem visible that is posed by the two different possibilities by which to value the shares held in a fund that is gated: there might be both drops in the relevant price when redemptions get suspended and jumps when funds re-open. In between, the secondary market prices that are used can be expected to increase the volatility of the series as compared to NAV based accounting. Of course this leads to possibly large negative returns whenever a fund has to suspend the redemption of shares, and this is the very nature of the problem faced by investors: When they want to sell shares and companies gate their funds, they can only obtain the secondary market price exactly from that day on where the suspension is effective. As fund companies cumulate orders of each day and respectively use one to four days of delayed clearing with the calculated prices to prevent from front-running, it might happen that a sell order can be rejected if it is among the last mass of orders that exceeds the available liquidity. Thus, at the next day, the relevant return is the secondary market price compared to the NAV before.

2. Index Construction

Accounting for dividends paid to obtain the total return information is a non-trivial problem in this case – dividend yields will differ from each other based on the assumption made regarding the investment period, i.e., based on whether the fund under consideration was bought at NAV or on the secondary market at the discounted price, and on how it is priced in the own accounting system⁹. When aiming for the most relevant total return index series for each fund, it is good practice to use the relevant price, and add the dividend to obtain the relevant total return index TRI_t^{rel} . Thereby, one does not have to make assumptions on investment periods, and the dividend that is paid on each share will be re-

⁹ Again, legislation comes into play. While some investors might be allowed to buy and sell on the secondary market, others are not. This depends on the type of investor and the applicable legislation and investment directive. In addition, different auditors take different stances on this.

ceived anyway, no matter the initial price paid. Normally, the drop in the NAV at the ex-dividend day should also be priced in on the secondary market, and therefore no bias in the results is to be expected.

$$(3) \quad TRI_t^{rel} = \frac{P_t^{rel} + Div_t}{P_{t-1}^{rel}} \cdot TRI_{t-1}^{rel} = \frac{(NAV_t \cdot (1 - S_t) + P_t^{sec}(S_t) + Div_t)}{(NAV_{t-1} \cdot (1 - S_{t-1}) + P_{t-1}^{sec}(S_{t-1}))} \cdot TRI_{t-1}^{rel}$$

Equation (3) thus provides the definition of each fund's relevant total return index series. This total return index series methodology is used to construct the performance indexes that are used to evaluate GOEREF performance in this study.

Problems in methodology may arise when a fund is closed for redemptions, but no secondary market trading is observed. This is in fact only a problem for the institutional funds where the investor base holds amounts of much larger lot sizes and investors often had bought shares by signing holding period agreements as mentioned above. Secondary market trading then imposes the problem of transferring the holding period agreements between investors and therefore most institutional funds are not listed on the stock exchanges, leaving over-the-counter transactions as the only way to sell shares. A common procedure by management companies of institutional funds is not to acknowledge the transferring of the holding agreements, enabling them to charge the full redemption fee when the second owner tries to redeem shares. Sellers in the need for liquidity then have to cope with low prices due to both the considerations that apply to retail funds and an additional discount of at least the redemption fee. To account for this, one possibility would be to use the NAV when no exchange trading takes place. However, while this may be in line with regulatory restrictions or accounting rules, it may lead to a performance that cannot be realized immediately and that will not be reached in the case that the fund will not re-open and/or NAV will go down.

A more robust yet assumption-based approach is to compute the average premium/discount of fund exchange prices compared to the NAV for traded funds, and apply this discount to the NAV of the funds that are gated but not being traded. This method can be used to approximate the expected price in line with peer averages, and leads to differing results from those obtained with NAV usage. Both results are reported in the empirical section.

3. *Classifying the Funds for Index Groups*

Building the indexes is done by grouping the three classes of funds according to their investor base, where a total of five groups is used as well as the whole sample. Groups are built as follows:

(1) *All*

All funds are used to get an overview of how the whole industry performed over time. This corresponds to a diversified overall picture on GOEREF performance, irrespective of fund class and investor base characteristics.

(2) *Retail*

All retail funds are used, e.g., those funds that are accessible to private investors¹⁰. This includes the funds from the cooperative savings banks, for which a separate banking account must exist. In general, these funds are therefore accessible for all retail and private investors, only with some additional bureaucratic work.

(3) *Retail ex coop*

Here, all retail funds of the co-operative savings banks are excluded to obtain the performance of retail funds that are open for all retail investors without having to set up accounts at the co-operative savings banks.

(4) *Coop*

Only the funds of the cooperative savings banks are included.

(5) *Institutional and retail*

All funds that are accessible for institutional investors are included. This includes the retail ex coop funds, as those are in general accessible for institutional investors¹¹, while the funds of the cooperative savings banks are not. This reflects the investment landscape that in general was open to fund-of-funds or wealth management and multi-asset class investors.

(6) *Institutional*

Only institutional funds targeting institutional investors and wealthy private investors are included.

¹⁰ The naming relates to how the funds for private investors are mainly termed. Alternative namings like “public” might be confusing, as institutional funds might be seen as public as well, only with minimum investment thresholds.

¹¹ Although retail funds in general target small private investors, most of them were also open for institutional money.

Weights are determined on an equal weight basis to form the indexes, this means that the number of funds may be very small, especially in earlier years of the industry. Calculation already starts when only one fund per group exists, but we report results only after at least five funds are included, in order to provide at least a minimally diversified picture¹². Results are reported for monthly rebalancing and buy-and-hold until a new fund enters the sample or one exits the sample. Note that monthly rebalancing implicitly assumes that when investors not only hold their investments from previous periods, but also buy funds, they buy them at the current relevant price, i.e., the secondary market price for funds with suspensions. Based on the methodology outlined above, all calculations provide a performance picture that is free from survivorship-biases.

Table 1 (see page 138) provides all necessary information on the 43 funds that are used for the indexes. The sample spans almost the entire GOEREF space, and to the authors knowledge delivers the most comprehensive picture of GOEREF performance to date¹³.

We contrast our findings with the results one would obtain when using only NAVs and when using NAVs corrected for redemption¹⁴.

IV. Empirical Results

1. Data

Data for NAVs, secondary market prices and dividends was obtained from Bloomberg and Datastream. As Bloomberg lists last dividends paid only, the identification problem for funds that pay no dividend in one year, or the same amount repeatedly, was solved using the ex-dividend day information recorded in Datastream. This is imposing a starting date in 1990 due to the beginning of Datastream dividend records for non-American funds being not before 1988 or 1989. Adjustments when there are one-day shifts in the data were manually corrected. Information on suspensions of redemptions was collected through press announcements

¹² Complete results will be delivered upon request.

¹³ Only two funds that are known are left out – those funds were in general accepted for only one investor. Credit Suisse WV Immofonds and Aberdeen ECT German Property 1 were therefore left out in the calculations.

¹⁴ Comparisons with indexes using secondary market prices only are not informative, as prices quickly adjust to values near the NAV when funds are reopened for redemptions.

of the respective fund management companies and direct inquiries and communication with the companies. Remaining data problems were solved by checking results using information from the homepages of fund management companies and by direct communication¹⁵.

2. Results of the Built Indexes

a) Indexes Calculated with NAVs

Before the performance using the relevant prices is analyzed, it is good practice to get insight into the performance over time when considering the reported NAVs for the funds and the groups. Tables 3 and 4 (see pages 142–145) report the descriptive statistics of the returns for the funds, and Table 5 (see page 146) reports those for the classes of funds and groups as explained in the previous section. In addition, Figure 1 (see page 148) shows the calculated total return indexes over time. From both the tables and the figure it is evident that the majority of funds had better performance before the liquidity crisis. This holds true both when dissecting the sample on an annual basis (tables) between 2007 and 2008, and at the time when the first funds had to suspend redemptions (figure) in October 2008.

Possible explanations for this are the general problems associated with the financial markets and the real estate markets, and the drops in valuations in several funds with suspensions of redemptions. However, as the calculation of average returns was done beginning in 1990, bad market conditions should also have been factored into the performance of the funds in earlier years. This was obviously more an exception than a rule however, leaving the problems associated with the product class of GOEREFs as the main explanation for the performance drain, while the question on the drivers in detail remains unanswered.

Regarding the various classes of funds and groups, the institutional funds had the best performance over time. Still, there appears to be a performance moderation in recent years. Although this might be attributed to the large devaluations in several funds that have major performance problems and will get terminated too, most funds do not reach their pre-2008 returns. A much more stable pattern can be observed for

¹⁵ The time-series should be virtually free from data errors. Successive checking and comparing with other sources was necessary due to surprisingly severe data problems especially in earlier years.

the funds of the cooperative savings banks, which apart from some minor devaluations and slightly lower returns continue their successful path. Clearly, the retail funds that are not managed by fund management companies belonging to the banks of the cooperative system have the strongest differences in performance. Given the fact that the institutional funds are normally able to manage their own money flows best, and that funds of the cooperative banks mainly have only moderate outflows due to close client management with other retail funds being heavily exposed to fund flow fluctuations, this indicates that apparently liquidity and performance are on average more related than should be expected from the general valuation principles and structure. In addition, this contradicts the claims made by several fund management companies that have or had gated funds. Thus, after having found a significant performance shift already at the NAV level, this should be even more evident in the analysis using the relevant prices.

b) Indexes Calculated Using Relevant Prices

Following the results using the NAV, the focus is on the calculated indexes using the relevant price. In Table 5, all results are shown for the case of monthly rebalancing and buy-and-hold until funds enter or exit the sample. Of course, the modifications for the funds that are not traded or that have redemption fees apply only to the groups containing institutional funds.

It is obvious that the performance of the funds that are managed by the cooperative savings banks outperform all other groups in large amounts after the onset of the phase of suspended redemptions. This stems from the fact that apart from the temporary suspension of Uni Immo Global, no fund of that group was ever closed and therefore the relevant prices are always the NAVs of those funds. In addition to the already pronounced break in performance when the relevant prices are considered, it has to be noted that in this case the performance is biased to the upside for classes and groups containing funds that are not traded and for which the NAV was set as relevant price. This could still be in line with the regulatory notion that there is a choice to account with either NAV or secondary market price, given that one would use market prices for gated funds that are traded, and NAV both for funds that are open for redemptions and those that are closed with no trading on the fund exchange.

While it comes as no surprise that the groups containing more gated funds performed worse, the effect of using relevant prices for periods when funds were gated is tremendous, with total return indexes coming down by up to 20 % from their peaks, thereby losing the gains of years within the time span of the liquidity crisis until now. Furthermore, not only did the losses erase the stable returns of previous periods, the fact that prices on the stock exchange fluctuate heavily is causing a significant increase in volatility, removing the second main characteristic of the formerly “safest-haven” asset class. In accordance with this, the maximum drawdowns for all indexes started after the beginning of the liquidity crisis, as can be seen as well from Table 5. Interestingly, this holds true even for the NAV-based analysis, only with smaller magnitude.

To obtain an even more realistic, fair-value related and liquidity-oriented picture that would apply for investors faced with shocks to their own liquidity or to reflect an accounting scheme that needs to incorporate market conditions rather than prices that might not be touched, the method of average market discounts to the NAV of gated funds with no trading can be used. Again, Table 5 reports those results for monthly rebalancing and buy-and-hold until funds enter or exit the sample, with the graphs of the indexes shown in Figure 2 (see page 149).

By construction, the effects are comparable to those from the analysis using relevant prices with NAVs for gated funds without trading, only more pronounced for the classes and groups containing the respective funds. Note that the redemption fees of institutional funds still have to be considered when redemptions were not announced timely or when traded on secondary markets or over the counter, and the buyer deducts the fee given the knowledge that most management companies do not acknowledge transfer of holding period agreements.

3. Discussion of Group Performances

From the tables and figures one can see how different the groups performed over the course of time. Some results are especially notable and should be discussed in light of the class or group constituents’ characteristics and specific developments:

1. Institutional funds performed best both on NAV basis and when using the relevant price, while most of the outperformance was achieved in pre-crisis times. A considerably slowing pace of growth in total return

and apparently even slightly down turning pattern can be seen in recent years when looking at NAVs. However, this is not the result of a generally worse performance across all funds included. Performance differences among the institutional funds are huge, with some funds suffering from losses and others performing very well. For example, some of the newest funds are able to outperform their peers that were incepted earlier and out of those especially the ones that had to suspend redemptions or even announce termination. This again points at previously mentioned possible shifts in valuation when funds are more likely to be required to sell property and/or terminate funds. Another explanation is the often specialized focus of any fund and relatively small portfolio sizes, causing limits to diversification. Normally, institutional funds pursue more risky investment strategies; with “value-add” strategies that are expected to have higher risk and higher return as opposed to “core” strategies.

On basis of the relevant price, the class of institutional funds is displaying a substantial downturn in the total return index. One needs to note that when considering the relevant price adjusted for NAV, one obtains the observable picture of NAV when funds are open and secondary market prices for gated funds that are traded. When using the relevant price and applying average discounts of gated funds with trading (Figure 2), one obtains the more assumed picture of performance reflecting the discounts discussed above for over-the-counter trading of institutional funds. In both cases, performance is clearly lacking the values achieved before the crisis (Table 5).

2. Retail ex co-op funds differ among each other as well. Funds that are integrated into own distribution networks (DWS-Deutsche Bank and Commerz Real-Commerzbank for example) were not closed for redemptions (apart from one short 2006 exception) and appear to stabilize the NAV based performance, even though they do not reach performances seen in pre-crisis periods. The class of retail ex co-op funds is heavily dispersed with respect to size, distribution network, age, focus, country allocation and strategy, what is mirrored in the dispersion of returns as well. However, apart from the distribution network effect there is no clear-cut relation of characteristics and performance, so if there would be any answer to the question on how and why the funds differ, this would be best answered by managerial ability and the interplay of effects discussed above.

Regarding the analysis using the relevant price, the observed differences are amplified, with several funds that had significant devaluations

being traded even at discounts of 30 to 50 %. This might reflect investors' fear that funds will not re-open and that the liquidation of the funds will be at liquidation values below NAV. This is in relation with previous considerations, as apparently market participants expect appraisers to more freely determine values of property.

3. The third class of funds, those of the cooperative savings banks, experienced and still experience the least volatile return pattern. Apart from the temporary closing of an UniImmo fund that was claimed to be related to the special event of the Fukushima disaster and several investments in Japan, there were neither redemption suspensions, nor notable performance events among the class. Therefore, the NAV and the relevant price pattern are largely the same, and there does not appear to be a break in performance. This is interesting in light of what was already seen before, namely a change in performance already at the NAV level only for gated funds. As obviously the only group that maintains the GOEREF structure of very stable returns and very low volatility is the one whose funds are least susceptible for liquidity troubles, strengthens the previous notion.

4. Analyzing the different combinations of fund classes thus yields both expected and unexpected results: While it may come as no surprise that the performance of most funds is worse since the beginning of the crisis, it is interesting to see that previous crises or economic slumps and real estate market cycles had virtually no impact. While the group analyses beginning later might not exhibit this to the last extent, the descriptive statistics of single funds in Table 4 and 5 that include all years since 1990 for several funds and the graphs of those funds (not shown for the sake of brevity, available upon request) do: They indicate that if there is any sensitivity to European real estate markets and economic developments, it is a new one. And, given what was found above, might be a function of valuation and liquidity.

V. Conclusions and Outlook

The analysis of different groups of GOEREFs using the concept of relevant prices provides insight into liquidity-corrected performance over time. While already at NAV level there appears to be a performance shift that poses an interesting research question in its own right, namely whether gated funds' property is appraised differently, the use of the secondary market prices for gated funds exhibits the drastic change in structure of return-risk profiles for GOEREFs from October 2008 onwards. Not only have returns decreased on average and have drops in prices due to devaluations increased in number and severity when compared to pre-crisis times, the volatility has also sky-rocketed when considering the relevant prices.

This has strong implications for investors, as the asset class (apart from the funds of the cooperative saving banks at least until October 2012) exhibits a structure of performance that is hardly comparable to what was seen before 2008 – and ultimately what was previously expected. This comes atop the changed law that makes investments in GOEREFs almost impossible for institutional investors. But even for retail investors the change in the risk-return profile is meaningful, with the safe-haven characteristic suddenly being removed from an asset class that did not know the term “loss” for decades.

Naturally, any change in structure poses both risks and chances, but from 2008 until October 2012, the direction of changes was mainly downwards. It will be interesting to see whether this will be reversed during the process of terminations. Clearly, this depends on the success of fund management companies to reduce their holdings at reasonable prices and whether the prices reached will surprise on the upside compared to the expectations that have been factored into the current valuations of fund shares on the secondary market – and in NAVs based on appraisers set values for property.

Being informative on the respective classes' and groups' performance over time, the constructed indices may serve even more purposes than solely reporting on the various performances, as asset allocation, risk management or dependency analyses might be done, thereby reflecting the asset class structures and removing the often analysis-distorting single fund events.

Although the structure of the GOEREF landscape has changed significantly, the asset class is still huge and a relevant part of the asset man-

agement industry. What however remains unclear is how the industry will fare with several funds being gated or in termination; and others aiming to continue on their successful path. The new law did not prevent funds with liquidity issues that were closed for redemptions to go into liquidation, while other funds did not need the helping hand of the regulators, yielding the change of law sort of ineffective.

Further research on the causes and drivers of the discounts, the apparent performance drain at NAV levels especially for the funds with suspensions, and the differences between classes and groups should be promising. This also holds true when new regulation with regard to fixed issuance and redemption periods based on the currently discussed and soon to be implemented EU directive will be in effect.

Table 1
Overview of GOEREFs

| Fund Name | Status | Incepted | Suspensions of Redemptions |
|-----------------------------------|-------------------------------|-----------------|--|
| Aachener Grundfonds 1 | open | 06/01/1974 | |
| Aachener Spar- und Stiftungsfonds | open | 04/04/2011 | |
| Axa Immoresidential | open, changed legal structure | 02/05/2009 | |
| Axa Immoselect | closed, in termination | 06/03/2002 | 10/28/2008–08/27/2009, since 11/17/2009 |
| Axa Immosolutions | closed, in termination | 10/26/2006 | since 05/26/2010 |
| Bouwfonds European Residential | open | 12/27/2007 | |
| Catella Focus Health Care | open | 09/24/2009 | |
| Catella Focus Nordic Cities | open | 09/03/2007 | 10/28/2008–01/28/2009 |
| Commerzreal Hausinvest Europa | open | 04/07/1972 | |
| Commerzreal Hausinvest Global | merged with Hausinvest Europa | 03/01/2004 | |
| Credit Suisse Euroreal | closed, in termination | 04/06/1992 | 10/29/2008–06/30/2009, since 05/18/2010 |
| Credit Suisse Property Dynamic | closed | 10/04/2006 | since 03/23/2012 |
| Degi Europa | closed, in termination | 11/07/1972 | since 10/31/2008 |
| Degi German Business | closed | 12/01/2006 | since 11/29/2011 |
| Degi Global Business | closed, in termination | 11/01/2005 | since 11/11/2009 |
| Degi International | closed, in termination | 02/17/2003 | 10/31/2008–01/30/2009, since 11/16/2009 |
| Deka Immobilien Europa | open | 01/20/1997 | |
| Deka Immobilien Global | open | 10/28/2002 | |
| DWS Grundbesitz Europa | open | 10/27/1970 | 12/12/2005–03/03/2006 |
| DWS Grundbesitz Global | open | 07/25/2000 | |
| Hansa Immobilien | closed, in termination | 07/25/2000 | since 10/02/2012 |
| Commerz Real Hausinvest Europa | open | 04/07/1972 | |
| Commerz Real Hausinvest Global | merged with Hausinvest Europa | 03/01/2004 | |
| iii Euro Immoprofil | open | 05/01/1965 | |
| iii Inter Immoprofil | merged with Euro Interprofil | 03/18/1998 | |
| Kan Am Grundinvest | closed, in liquidation | 11/15/2001 | 01/19/2006–04/05/2006, 10/28/2008–07/06/2009, since 05/06/2010 |
| Kan Am Spezial Grundinvest | closed | 01/25/2005 | 02/02/2012 |
| Kan Am US Grundinvest | closed, in liquidation | 11/02/2006 | 01/17/2006–04/16/2006, since 10/27/2008 |

| Announced Liquidation/ Latest Liquidation Date | Target Investors | New Law Implemented | Max. Redemption Fee |
|---|---|--------------------------------|--------------------------------|
| | church-associated | no | no |
| | church-associated | no | no |
| | institutional | no | 3 % |
| 10/19/2011 / 10/20/2014 | retail | no | no |
| 10/19/2011 / 06/30/2014 | institutional | no | 3 % |
| | institutional | no | no |
| | institutional | no | no |
| | institutional | no | no |
| | retail | no | no |
| merged on 09/30/2010 | retail | no | no |
| 05/21/2012 / 04/30/2017 | retail | no | no |
| | institutional | no | 3 % |
| 10/22/2010 / 09/30/2013 | retail | no | no |
| | institutional | no | 10 % |
| 08/18/2011 / 06/30/2014 | institutional | no | 4 % |
| 10/19/2011 / 10/15/2014 | retail | no | no |
| | retail, own clients of co-operative bank | no | no |
| | retail, own clients of co-operative bank | no | no |
| | retail | no | no |
| | retail | no | no |
| 09/05/2012 / 04/06/2013 | retail | no | no |
| | retail | no | no |
| merged on 09/30/2010 | retail | no | no |
| | retail | no | no |
| merged on 10/31/2010 | retail | no | no |
| 02/29/2012 / 12/31/2016 | retail | no | no |
| | institutional | no | 4 % |
| 09/30/2010 / 03/31/2012 | retail | no | no |

Table 2
Overview of GOEREFs (cont.)

| Fund Name | Status | Incepted | Suspensions of Redemptions |
|--|------------------------|-----------------|--|
| Morgan Stanley P2 Value | closed, in liquidation | 11/04/2005 | since 10/30/2008 |
| Pradera Open European Retail | open | 12/03/2009 | |
| SEB Global Property | closed | 11/02/2006 | 12/07/2011 |
| SEB Immoinvest | closed, in liquidation | 05/02/1989 | 10/29/2008–05/28/2009, since 05/05/2010 |
| SEB Immo Portfolio Target Return | closed | 10/15/2001 | 06/13/2012 |
| TMW Weltfonds | closed, in liquidation | 06/01/2005 | 10/29/2008–12/10/2009, since 02/08/2010 |
| UBS 3 Sector Real Estate | closed, in liquidation | 10/13/2003 | 10/30/2008–10/26/2009, since 10/06/2010 |
| UBS Euroinvest | open | 09/28/1999 | 10/30/2008–08/06/2009 |
| Uni Immo Deutschland | open | 07/01/1966 | |
| Uni Immo Europa | open | 04/01/1985 | |
| Uni Immo Global | open | 04/01/2004 | 03/17/2011–06/15/2011 |
| Uni Institutional European Real Estate | open | 01/02/2004 | |
| Warburg Henderson Deutschland 1 | open | 04/01/2004 | |
| Warburg Henderson Deutschland Plus | open | 12/23/2008 | |
| Warburg Henderson Multinational Plus | open | 06/27/2007 | |
| Wertgrund Wohnselect | open | 04/20/2010 | |
| West Invest Interselect | open | 10/02/2000 | |

Notes: Maximum fees reported correspond to fee that may be charged when redemptions are made before shortest lock-up/holding period is over and/or redemption is not announced timely. Degi German Business fee was changed from 4 % maximum to 10 % in December 2010. The termination of KanAm US Grundinvest was not fulfilled within announced time span, fund now managed by custody bank. Axa Immoresidential changed legal structure to German Spezialfonds beginning March 2012.

| Announced Liquidation/ Latest Liquidation Date | Target Investors | New Law Implemented | Max. Redemption Fee |
|---|---|--------------------------------|--------------------------------|
| 10/26/2010 / 05/11/2015 | retail | no | no |
| | institutional | no | 5 % |
| | institutional | no | 7 % |
| 05/07/2012 / 04/30/2017 | retail | no | no |
| 10/19/2011 / 06/30/2014 | institutional | no | 3 % |
| 05/31/2011 / 05/31/2014 | retail | no | no |
| 09/05/2012 / 09/05/2015 | retail | no | 3 % |
| | institutional | no | no |
| | retail, own clients of co-operative savings bank | no | no |
| | retail, own clients of co-operative savings bank | no | no |
| | retail, own clients of co-operative savings bank | no | no |
| | institutional | no | 2 % |
| | institutional | no | no |
| | institutional | no | no |
| | institutional | no | no |
| | retail, own clients of co-operative savings bank | no | 7 % |
| | retail, own clients of co-operative savings bank | no | no |

Table 3
Descriptive Statistics for GOEREFs Over Time

| Fund | Return according to NAV (1990–2007) | Return according to NAV (2008–2012) | Volatility according to NAV (1990–2007) |
|-----------------------------------|--|--|--|
| Aachener Grundfonds 1 | 3,27 % | 3,88 % | 1,14 % |
| Aachener Spar- und Stiftungsfonds | N/A | 1,53 % | N/A |
| Axa Immoresidential | N/A | 1,69 % | N/A |
| Axa Immoselect | 1,51 % | –0,52 % | 0,61 % |
| Axa Immosolutions | 0,28 % | 0,04 % | 0,36 % |
| Bouwfonds European Residential | N/A | 4,18 % | N/A |
| Catella Focus Health Care | N/A | 1,50 % | N/A |
| Catella Focus Nordic Cities | N/A | 3,64 % | N/A |
| Commerzreal Hausinvest Europa | 5,61 % | 3,48 % | 1,15 % |
| Commerzreal Hausinvest Global | 0,87 % | 1,79 % | 0,52 % |
| Credit Suisse Euroreal | 4,73 % | 1,53 % | 1,44 % |
| Credit Suisse Property Dynamic | 0,43 % | 3,92 % | 0,21 % |
| Degi Europa | 4,95 % | –14,26 % | 1,12 % |
| Degi German Business | 0,27 % | –1,25 % | 0,10 % |
| Degi Global Business | 0,83 % | –10,16 % | 0,99 % |
| Degi International | 1,06 % | –3,07 % | 0,33 % |
| Deka Immobilien Europa | 2,87 % | 3,05 % | 1,02 % |
| Deka Immobilien Global | 1,31 % | 3,48 % | 0,52 % |
| DWS Grundbesitz Europa | 5,82 % | 3,46 % | 2,00 % |
| DWS Grundbesitz Global | 1,98 % | 2,79 % | 0,72 % |
| Hansa Immobilien | 3,37 % | 0,22 % | 1,02 % |
| iii Euro Immoprofil | 4,31 % | –1,48 % | 1,24 % |
| iii Inter Immoprofil | 2,36 % | 2,39 % | 0,90 % |
| Kan Am Grundinvest | 2,14 % | 0,54 % | 0,91 % |
| Kan Am Spezial Grundinvest | 1,00 % | 0,40 % | 0,57 % |
| Kan Am US Grundinvest | 1,62 % | 2,28 % | 0,43 % |

Notes: Annualized returns and volatility reported for funds that existed at least one year during the respective time span of January 1990 until October 2012. Time spans are separated on 31st December 2007. Relevant returns calculated using secondary market prices. For funds where no trading was done but that were gated, average discounts were used. Trading volume on secondary market is reported in Euro million.

| Volatility according to NAV (2008–2012) | Return according to Relevant Price (2008–2012) | Volatility according to Relevant Price (2008–2012) | Volume Traded |
|--|---|---|----------------------|
| 0,56 % | 3,88 % | 0,56 % | 0 |
| 0,98 % | 1,53 % | 0,98 % | 0 |
| 0,97 % | 1,69 % | 0,97 % | 0 |
| 1,81 % | –12,24 % | 16,39 % | 815 |
| 2,81 % | –4,69 % | 11,54 % | 0 |
| 1,08 % | 4,18 % | 1,08 % | 0 |
| 1,15 % | 1,50 % | 1,15 % | 0 |
| 0,89 % | 3,64 % | 0,89 % | 0 |
| 0,51 % | 3,48 % | 0,51 % | 368 |
| 1,00 % | 1,79 % | 1,00 % | 7 |
| 1,63 % | –5,59 % | 15,94 % | 1535 |
| 0,49 % | –2,11 % | 9,35 % | 0 |
| 11,40 % | –23,85 % | 24,24 % | 724 |
| 2,85 % | –6,98 % | 11,15 % | 0 |
| 11,28 % | –15,39 % | 14,15 % | 0 |
| 2,31 % | –10,00 % | 19,75 % | 238 |
| 0,52 % | 3,05 % | 0,52 % | 179 |
| 0,65 % | 3,48 % | 0,65 % | 120 |
| 0,77 % | 3,46 % | 0,77 % | 328 |
| 0,90 % | 2,79 % | 0,90 % | 140 |
| 1,86 % | –5,01 % | 15,33 % | 66 |
| 1,92 % | –1,48 % | 1,92 % | 58 |
| 1,81 % | 2,39 % | 1,81 % | 62 |
| 2,26 % | –4,97 % | 13,51 % | 0 |
| 4,67 % | –20,73 % | 29,48 % | 1858 |
| 11,36 % | 9,47 % | 37,98 % | 114 |

Table 4
Descriptive Statistics for GOEREFs Over Time (cont.)

| Fund | Return according to NAV (1990–2007) | Return according to NAV (2008–2012) | Volatility according to NAV (1990–2007) |
|--|--|--|--|
| Morgan Stanley P2 Value | 0,64 % | –13,24 % | 0,35 % |
| Pradera Open European Retail | N/A | 3,97 % | N/A |
| SEB Global Property | 0,37 % | 0,39 % | 0,23 % |
| SEB Immo Portfolio Target Return | 2,95 % | 5,06 % | 2,07 % |
| SEB Immoinvest | 6,04 % | 1,39 % | 1,23 % |
| TMW Weltfonds | 0,74 % | –2,24 % | 0,39 % |
| UBS 3 Sector Real Estate | 1,03 % | 0,54 % | 0,96 % |
| UBS Euroinvest | 4,11 % | 3,48 % | 3,93 % |
| Uni Immo Deutschland | 5,33 % | 2,86 % | 1,38 % |
| Uni Immo Europa | 5,38 % | 2,96 % | 1,57 % |
| Uni Immo Global | 0,84 % | 2,33 % | 0,32 % |
| Uni Institutional European Real Estate | 1,00 % | 3,53 % | 0,25 % |
| Warburg Henderson Deutschland 1 | 1,69 % | 1,53 % | 0,83 % |
| Warburg Henderson Deutschland Plus | N/A | 4,38 % | N/A |
| Warburg Henderson Multinational Plus | N/A | –2,11 % | N/A |
| Wertgrund Wohnselect | N/A | 1,72 % | N/A |
| West Invest Interselect | 2,16 % | 2,40 % | 1,14 % |

Notes: Annualized returns and volatility reported for funds that existed at least one year during the respective time span of January 1990 until October 2012. Time spans are separated on 31st December 2007. Relevant returns calculated using secondary market prices. For funds where no trading was done but that were gated, average discounts were used. Trading volume on secondary market is reported in Euro million.

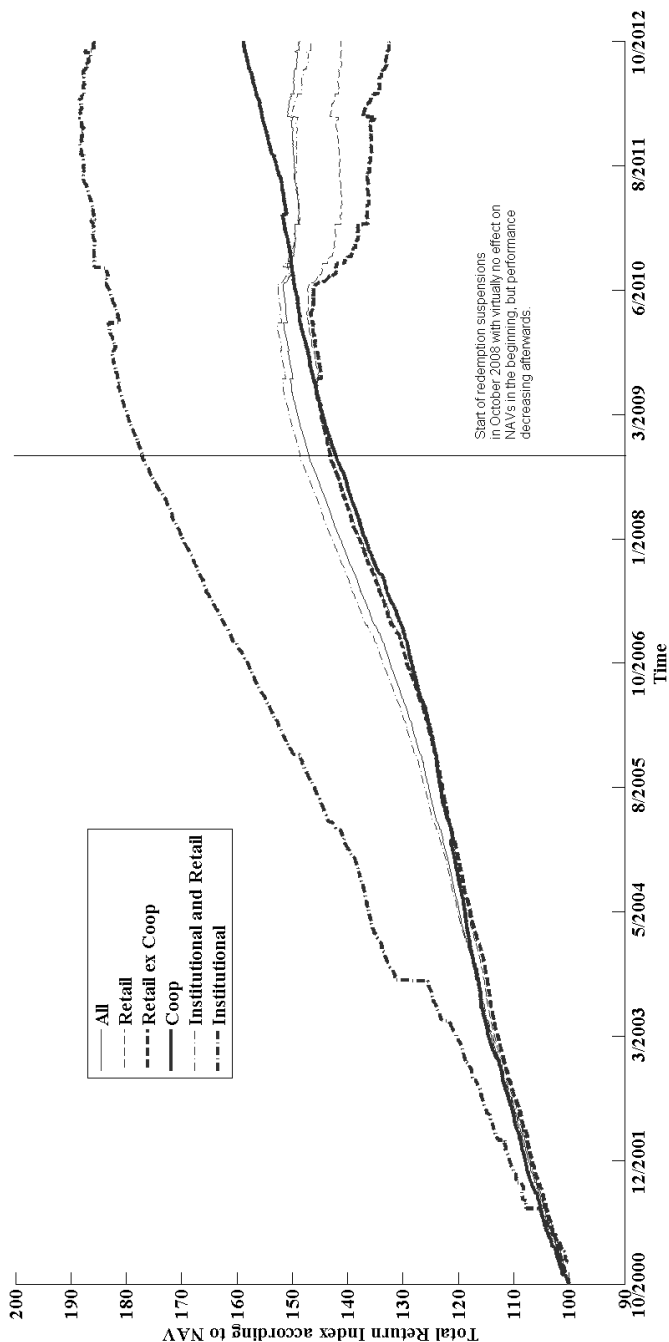
| Volatility according to NAV (2008–2012) | Return according to Relevant Price (2008–2012) | Volatility according to Relevant Price (2008–2012) | Volume Traded |
|--|---|---|----------------------|
| 12,52 % | –15,79 % | 23,94 % | 513 |
| 2,31 % | 3,97 % | 2,31 % | 0 |
| 2,64 % | –5,47 % | 10,10 % | 0 |
| 0,90 % | –1,26 % | 12,10 % | 0 |
| 2,77 % | –5,11 % | 16,25 % | 1080 |
| 2,23 % | –16,97 % | 58,89 % | 180 |
| 1,79 % | –12,08 % | 39,52 % | 53 |
| 0,74 % | 3,49 % | 6,03 % | 170 |
| 0,39 % | 2,86 % | 0,39 % | 97 |
| 0,41 % | 2,96 % | 0,41 % | 85 |
| 2,17 % | 2,33 % | 6,93 % | 37 |
| 0,56 % | 3,53 % | 0,56 % | 0 |
| 2,60 % | 1,53 % | 2,60 % | 0 |
| 8,74 % | 4,38 % | 8,74 % | 0 |
| 3,29 % | –2,11 % | 3,29 % | 0 |
| 0,71 % | 1,72 % | 0,71 % | 0 |
| 0,56 % | 2,40 % | 0,56 % | 153 |

Table 5
Descriptive Statistics for Calculated Indexes

| Class or Group | Price Used | Rebalancing | Return (October 2000–2007) | Return (2008–2012) |
|--------------------------|-------------------|--------------------|---------------------------------------|-------------------------------|
| All | NAV | monthly | 4,87 % | 1,04 % |
| Retail | NAV | monthly | 4,49 % | 0,53 % |
| Retail ex Coop | NAV | monthly | 4,51 % | –0,81 % |
| Coop | NAV | monthly | 4,40 % | 3,14 % |
| Retail and Institutional | NAV | monthly | 5,02 % | 0,50 % |
| Institutional | NAV | monthly | 7,54 % | 1,81 % |
| All | RP, AD | monthly | 4,91 % | –0,35 % |
| All | RP, NAV | monthly | 4,91 % | 0,41 % |
| Retail | RP | monthly | 4,54 % | –0,56 % |
| Retail ex Coop | RP | monthly | 4,58 % | –2,43 % |
| Coop | RP | monthly | 4,40 % | 3,17 % |
| Retail and Institutional | RP, AD | monthly | 5,08 % | –1,24 % |
| Retail and Institutional | RP, NAV | monthly | 5,08 % | –0,29 % |
| Institutional | RP, AD | monthly | 7,54 % | 0,00 % |
| Institutional | RP, NAV | monthly | 7,54 % | 1,83 % |
| All | NAV | buy and hold | 4,88 % | 1,11 % |
| Retail | NAV | buy and hold | 4,49 % | 0,61 % |
| Retail ex Coop | NAV | buy and hold | 4,51 % | –0,71 % |
| Coop | NAV | buy and hold | 4,39 % | 3,14 % |
| Retail and Institutional | NAV | buy and hold | 5,03 % | 0,58 % |
| Institutional | NAV | buy and hold | 7,60 % | 1,84 % |
| All | RP, AD | buy and hold | 4,90 % | –0,24 % |
| All | RP, NAV | buy and hold | 4,90 % | 0,50 % |
| Retail | RP | buy and hold | 4,51 % | –0,38 % |
| Retail ex Coop | RP | buy and hold | 4,54 % | –2,10 % |
| Coop | RP | buy and hold | 4,39 % | 3,17 % |
| Retail and Institutional | RP, AD | buy and hold | 5,05 % | –1,11 % |
| Retail and Institutional | RP, NAV | buy and hold | 5,05 % | –0,17 % |
| Institutional | RP, AD | buy and hold | 7,60 % | 0,01 % |
| Institutional | RP, NAV | buy and hold | 7,60 % | 1,85 % |

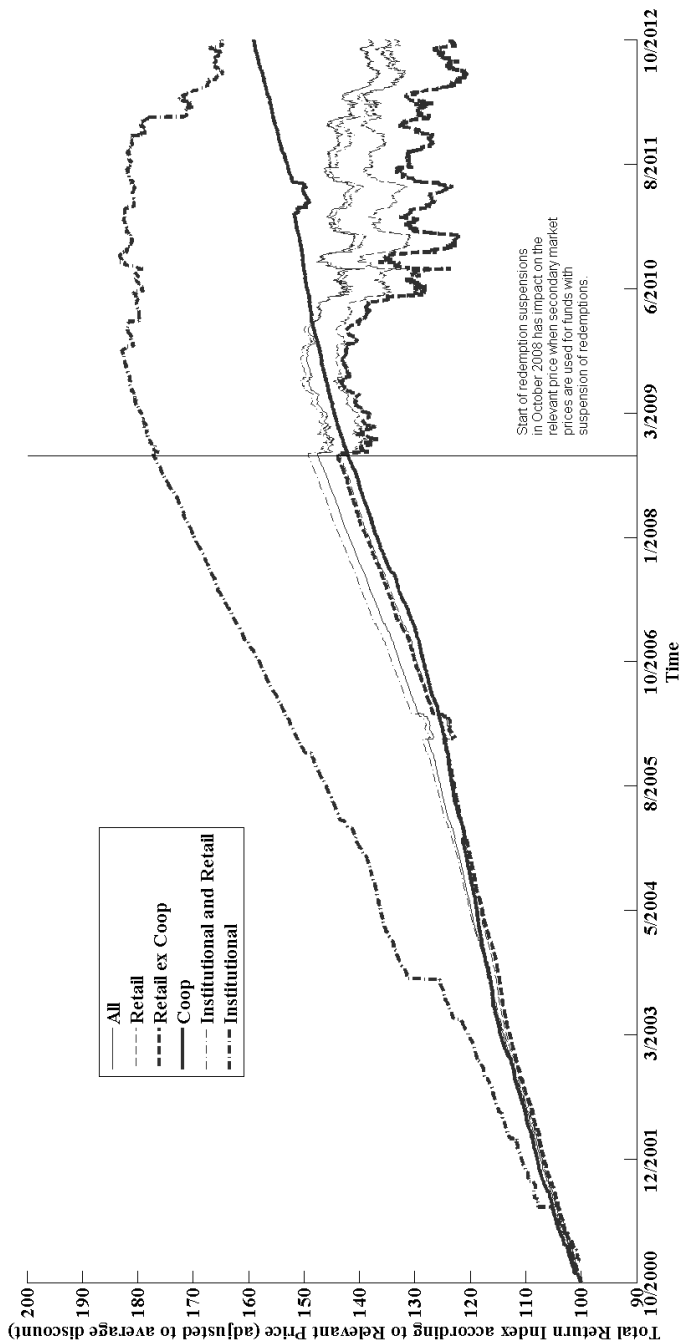
Notes: The early sub-sample starts in October 2000 when all indexes had at least 5 constituents. RP, AD and RP, NAV indicate whether average discounts or NAV were used for gated funds with no trading. Returns and volatility annualized.

| Volatility (October 2000–2007) | Volatility (2008–2012) | Maximum Drawdown | Maximum Drawdown Begin | Maximum Drawdown End |
|---|-----------------------------------|-----------------------------|-----------------------------------|---------------------------------|
| 0,48 % | 0,71 % | 2,04 % | June-10 | October-12 |
| 0,44 % | 0,93 % | 4,44 % | March-10 | April-11 |
| 0,50 % | 1,41 % | 10,16 % | March-10 | October-12 |
| 0,58 % | 0,38 % | 0,53 % | February-11 | February-11 |
| 0,56 % | 0,88 % | 4,30 % | February-10 | October-12 |
| 2,18 % | 1,05 % | 1,80 % | April-12 | October-12 |
| 0,60 % | 3,14 % | 8,15 % | September-09 | July-12 |
| 0,60 % | 2,70 % | 5,28 % | January-10 | August-10 |
| 0,64 % | 4,52 % | 10,46 % | July-09 | December-10 |
| 0,82 % | 6,81 % | 18,20 % | October-08 | June-12 |
| 0,58 % | 0,86 % | 1,86 % | February-11 | April-11 |
| 0,74 % | 3,92 % | 12,14 % | July-09 | July-12 |
| 0,74 % | 3,35 % | 6,99 % | July-09 | December-10 |
| 2,18 % | 1,92 % | 7,74 % | September-10 | October-12 |
| 2,18 % | 1,14 % | 1,80 % | April-12 | October-12 |
| 0,47 % | 0,69 % | 1,77 % | June-10 | February-11 |
| 0,44 % | 0,90 % | 4,16 % | March-10 | April-11 |
| 0,50 % | 1,38 % | 9,67 % | March-10 | October-12 |
| 0,58 % | 0,38 % | 0,53 % | February-11 | February-11 |
| 0,56 % | 0,86 % | 3,95 % | February-10 | October-12 |
| 2,18 % | 1,03 % | 1,74 % | April-12 | October-12 |
| 0,58 % | 3,12 % | 7,67 % | September-09 | July-12 |
| 0,58 % | 2,70 % | 5,14 % | January-10 | December-10 |
| 0,61 % | 4,53 % | 10,33 % | July-09 | December-10 |
| 0,78 % | 6,90 % | 16,85 % | October-08 | December-10 |
| 0,58 % | 0,84 % | 1,82 % | February-11 | April-11 |
| 0,71 % | 3,91 % | 11,59 % | July-09 | July-12 |
| 0,71 % | 3,36 % | 6,94 % | July-09 | December-10 |
| 2,18 % | 1,89 % | 7,67 % | September-10 | October-12 |
| 2,18 % | 1,12 % | 1,74 % | April-12 | October-12 |



Notes: The plot shows the calculated total return indexes for all 6 groups. Here the monthly rebalanced indexes are shown, calculations using NAV. Bold lines used for the three separate classes retail ex coop, coop and institutional, thin lines for composites of the classes. Shown from the beginning of October 2000 to October 2012, as from then on each group had at least 5 constituents.

Figure 1: Index of GOEREF Groups when Using NAV



Notes: The plot shows the calculated total return indexes for all 6 groups. Here the monthly rebalanced indexes are shown, calculations using relevant price. When no trading is done but funds are gated, average discount is used. Bold lines used for the three separate classes retail ex coop, coop and institutional, thin lines for composites of the classes. Shown from the beginning of October 2000, as from then on each group had at least 5 constituents.

Figure 2: Index of GOEREF Groups when Using Relevant Price, Adjusted to Average Discount

References

- Bannier, C./Fecht, F./Tyrell, M.* (2008), Open-end real estate funds in – Germany – genesis and crisis. *Kredit und Kapital* 41(1):9–36. – *Clayton, J./Geltner, D./Hamilton, S.* (2001), Smoothing in commercial property valuations – evidence from individual appraisals. *Real Estate Economics* 29(2):337–360. – *Downie, M./Schulte, K./Thomas, M.* (1996), *European Valuation Practice* ed. Adair, A., M. L. Downie, S. McGreal and G. Vos, EI&Fn. Spon, London. – *Edelstein, R./Quan, D.* (2006), How does appraisal smoothing bias real estate returns measurement? *Journal of Real Estate Finance and Economics* 32(1):41–60. – *Geltner, D.* (1991), Smoothing in appraisal-based returns. *Journal of Real Estate Finance and Economics* 4(3):327–345. – *Geltner, D./MacGregor, B./Schwann, G.* (2003), Appraisal smoothing and price discovery in real estate markets. *Urban Studies* 40(5–6):1047–1064. – *Maurer, R.* (2004), Institutional investors in Germany: Insurance companies and investment funds. *The German Financial System* ed. Krahnen, J. P. and R. H. Schmidt. – *Maurer, R./Reiner, F./Rogalla, R.* (2004a), Return and risk of German open-end real estate funds. *Journal of Property Research* 21(3):209–233. – *Maurer, R./Reiner, F./Sebastian, S.* (2004b), Characteristics of German real estate return distributions: Evidence from Germany and comparison to the U.S. and U.K. *Journal of Real Estate Portfolio Management* 16(1):59–76. – *McParland, C./Adair, A./McGreal, S.* (2002), Valuation standard – a comparison of four European countries. *Journal of Property Valuation and Investment* 20(2):127–141. – *Sebastian, S./Strohsal, T.* (2011), German open-ended real estate funds. *Understanding German Real Estate Markets* ed. Maennig, W. and T. Just. – *Stein, M.* (2011), The true cost of liquidity. *IPE Real Estate* November/December 2012. – *Stein, M./Rachev, S.* (2011), Flow-induced redemption costs in funds of funds. *Journal of Derivatives & Hedge Funds* 17:253–265.

Summary

German Open Ended Real Estate Fund Performance – The Impact of Liquidity

The liquidity crisis in the German Open-Ended Real Estate Funds (GOEREFs) industry was characterized by large outflows of money in several funds. Large and ongoing redemptions of fund shares held by both institutional and private/retail investors led to suspensions of redemptions, termination of funds and, ultimately, a new law. This study provides the most comprehensive overview of how the funds performed and how pronounced the differences between classes of funds in the €80bn+ industry are. Using not only the net asset values of the funds as reported by the fund management companies, but the prices obtained at the secondary market when redemptions are suspended, indexes are constructed in order to provide a clear view of the performance of GOEREFs when the most relevant prices are used – those that may be achieved directly, rather than using book values. In this sense, the indexes provide a liquidity-corrected picture of fund returns. (G01, G10, G12)

Zusammenfassung

Performance deutscher offener Immobilienfonds: Auswirkung der Liquidität

Die Liquiditätskrise der deutschen offenen Immobilienfonds war gekennzeichnet durch starke Abflüsse von Kapitale in vielen der Fonds. Anhaltende und teilweise hohe Rückgaben von Anteilscheinen durch institutionelle und private Investoren hat zu Aussetzungen von Anteilscheinrücknahmen, sowie der Auflösung von Fonds und letztendlich auch einer neuen Gesetzgebung geführt. Diese Studie gibt den wohl umfassendsten Überblick über die Wertentwicklung der Fonds und darüber wie unterschiedlich diese innerhalb der über 80 Millionen Euro schweren Branche war. Hierzu wird nicht nur auf den Net Asset Value, den KAG-Preis abgestellt, sondern auch auf die Preise welche am Zweitmarkt erzielt werden können wenn Anteilscheinrücknahmen ausgesetzt sind. Entsprechende Performance-Indices werden berechnet um ein klares Bild von der Wertentwicklung der Fonds zu erhalten wenn die tatsächlich relevanten Preise verwendet werden – jene welche direkt erzielt werden können, anstatt sich auf die Buchwerte zu beziehen. Somit erhält man eine Übersicht über die Rendite welche erzielt werden kann, wenn über den erzielbaren Preis bereits für die Liquidität korrigiert wurde. (G01, G10, G12)