



## Open-ended property funds: Risk and return profile – Diversification benefits and liquidity risks

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### ABSTRACT

In addition to the well-established forms of real estate investing (direct and listed), investors can also choose open-ended property funds (OPFs), which are considered a complementary real estate investment option. OPF fund managers generally provide daily liquidity, and these funds must maintain at least 5% liquidity. If liquidity falls below 5%, share redemptions will be temporarily suspended, for a period of up to two years. During this time, investors can only sell shares on the secondary market (exchange), and are thus subject to significant liquidity risk. The objective of this paper is to examine the impact of OPFs as an investment vehicle on the risk and return profile. OPFs in principle have the same underlying as direct and listed real estate investments, but they are subject to a different regulatory regime. Therefore, we analyze the diversification benefits of OPFs in mixed-asset portfolios for various risk measures, investor types, and holding periods. We find that OPFs are ideally suited to reduce portfolio risk. This result holds independent of the holding period and whether in- or out-of-sample Monte Carlo portfolio simulations are used. However, these positive effects come at the cost of increased risk from temporary share redemption suspensions. During these periods, investors may have to accept an average 6% discount in the secondary market compared to the net asset value calculated by OPFs themselves. These discounts can go as high as 20% if investors fear that OPF management will not be able to ensure liquidity within the two-year time limit, and will have to “fire-sell” properties.

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### 1. Introduction

Over the past two decades, investments in real estate have increased dramatically. This growth is at least partially driven by the perceived diversification benefits that real estate offers in multi-asset portfolios. Both direct and listed real estate investments can take advantage of these benefits. However, although the underlying asset is the same, direct and listed real estate investments have very different institutional setups and hence different risk-return profiles (for example, the volatility of respective indices for listed real estate is much higher than for direct real estate – see Table 3). Especially liquidity risk can be very different for varying real estate investments, and can potentially offset diversification benefits.

In this paper, we investigate open-ended property funds (OPFs) as a further means – besides direct and listed real estate investments – to add real estate to institutional and private portfolios. Fund managers invest directly in an internationally diversified real estate portfolio, while

holding a cash-equivalent position ranging from 5% to 49% of assets under management for daily liquidity. The resulting historical returns are attractive and quite consistent, with little risk and low correlation with other asset classes. However, the downside is that OPFs must temporarily suspend share redemptions if fund liquidity falls below 5% (see Maurer et al., 2004). Fund managers will then have a maximum of two years to either attract sufficient new asset inflows and/or to liquidate portfolio properties to ensure fund liquidity again. During this time, investors cannot redeem shares, but can sell them in a secondary market. However, market prices can have discounts to the net asset value (NAV) of up to about 20%. Also, there is the risk that fund managers will not have enough liquidity to reopen within the two-year time limit, and may have to sell properties at a loss to ensure liquidity (“fire-sale”). In this case, the realized prices for the sold properties are highly uncertain. Thus, OPF investors bear liquidity risk.

The innovative thrust of this study is threefold. We aim to 1) analyze the impact on the return distributions of OPFs as a further investment option besides direct and listed real estate investments (see Section 4), 2) identify the suitability of German OPFs as an essential building block in private and institutional portfolios (Section 5), and 3) evaluate the severity of any liquidity risk caused by temporary suspensions of

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share redemptions (Section 6). We will thus determine the optimal weights of OPFs in mixed-asset portfolios by considering the trade-off between risk (as measured by standard deviation, lower partial moments, conditional value-at-risk, and maximum drawdown) and return using portfolio optimization.<sup>1</sup>

In our analyses, we consider the special properties of OPFs, especially the positive autocorrelation that results from return-smoothing and the non-normality of the return distribution. Furthermore, we perform several Monte Carlo simulations (in- and out-of-sample) to evaluate OPF characteristics in mixed-asset portfolios for different holding periods.

Ultimately, we find that OPFs can play an important role in a portfolio context for all investor types examined here, regardless of which risk measure is considered or which holding period is chosen. However, there is one condition: that OPF share redemptions not be temporarily suspended.

To investigate potential liquidity risks for OPF investors, we examine short- and long-term valuation effects around the temporary suspension of share redemptions during the only two periods it has occurred (2005/2006 and 2008/2010). We find that investors were not negatively affected if they did not sell their shares in the secondary market (exchange), and if the OPFs provided liquidity before the end of the two-year time limit. Investors who did sell their shares in the secondary market had to accept on average a 6% discount off the NAV calculated by the OPFs themselves.

For OPFs *unlikely* to reopen before the two-year time limit, there is high uncertainty about their NAVs compared to the realized market prices of sold properties. In these cases, investors will be subject to discounts as high as 20% in the secondary market.

The remainder of this paper is structured as follows. Section 2 gives an overview of the related literature. Section 3 introduces OPFs and describes the construction of an appropriate market index. Section 4 provides descriptive statistics for the index and discusses other asset classes. Section 5 introduces the fundamentals of portfolio optimization, and examines how OPFs can impact the risk and return profile of efficient portfolios under several risk measures. It also illustrates the benefits of OPFs for different holding periods. Section 6 evaluates OPF liquidity risk by presenting our examination of fund returns around the temporary suspension of share redemptions. Section 7 summarizes our main results and gives our conclusions.

## 2. Literature review

Investors' (such as insurance companies, banks, corporations and pension funds) interest in direct and listed real estate investments has increased dramatically in recent years. These instruments seem to provide attractive risk and return profiles, as well as high diversification potential for a mixed-asset portfolio. For that reason many researchers have studied and attempted to model the benefits of establishing diversification strategies for portfolio investments. Within this section we give a comprehensive overview of the evolution in the literature of diversification benefits for direct and listed real estate investments.

Several researchers studied the risk and return characteristics of stocks, bonds, and cash to real estate and analyzed optimal portfolio choice (diversification benefits) of direct real estate investments, including Ross and Webb (1985), Marks (1986), Webb and Rubens (1989) and Ross and Zisler (1991).<sup>2</sup> Ziobrowski and Curcio (1991) extend this literature by exploring potential benefits by adding international real estate investments to a mixed-asset portfolio.

Later studies with direct real estate investments for more countries include Newell and Webb (1994), Quan and Titman (1997), Stevenson

(1998), Quan and Titman (1999), Chua (1999), Cheng, Ziobrowski, Caines, and Ziobrowski (1999) and Hoesli, Lekander, and Witkiewicz (2004). All these studies use the classical mean-variance approach and come to the conclusion that direct real estate provides diversification benefits.

More recent studies analyze other issues of investments in direct real estate. Fugazza, Guidolin, and Nicodano (2007) study optimal real estate allocation for long-horizon investors (i.e. considering return predictability). This is of major importance for long run investors, as it is well known that when returns are predictable the mean-variance asset allocation may differ substantially from the long-term one (see Bodie, 1995) while the investor's planning horizon is irrelevant for portfolio choice when returns are independently and identically distributed. Hoevenaars, Molenaar, Schotman, and Steenkamp (2008) study direct real estate investments in an asset-liability framework.

Mixed-asset portfolio studies using listed real estate<sup>3</sup> start with the work by Asabere, Kleiman, and McGowan (1991) and Kleiman and Farragher (1992), who find diversification gains by including REITs in the portfolios. Further evidence on diversification benefits in more countries is given by Eichholtz (1996), Eichholtz and Koedijk (1996), Eichholtz (1997), Mull and Soenen (1997), Gordon, Canter, and Webb (1998), Liu and Mei (1998), Gordon and Canter (1999), Stevenson (1999), Stevenson (2000), Maurer and Reiner (2002), Conover, Swint Friday, and Howton (1998) and Chen, Ho, Lu, and Wu (2005). Another strand of the literature studies real-estate-only portfolios using REITs. The diversification benefits of international investments in REITs are studied in Giliberto (1990), Addae-Dapaah and Kion (1996), Wilson and Okunev (1996), Eichholtz (1997), Pierzak (2001) and Bigman (2002).

Summarizing, these studies suggest that direct and listed investments in real estate are suitable for achieving diversification benefits. However, both investment vehicles have different risk and return profiles, even if the underlying property is equal. This is reflected in a much higher volatility for listed real estate than for direct real estate, which can be interpreted in a way that investment vehicle type also impacts the return distribution for an equal underlying.

As an example, comparable characteristics are found in the option market, where investors can choose to invest in a company share directly or indirectly, with an option based on the same company share as the underlying. Therefore, in this analogy, investment vehicles will significantly impact the risk and return profile because the optional investment alternative reshapes the original return distribution of the underlying.

## 3. The German OPF market

### 3.1. Fundamental features

From a legal perspective, an open-ended property fund is a separate special asset, with an investment focus on property initiated and managed by a capital investment company. For investor protection purposes, OPFs are controlled by regulations for identifying, diversifying, and controlling risks, as well as for realizing gains and fund liquidity.<sup>4</sup>

Open-ended property funds were first created in 1959, with the establishment of the "Internationales Immobilien Institut" (the international real estate institute, known as iiii-investments). The first German OPF was iiii-funds No. 1. Since 1991, there are enough OPFs for a meaningful index formation and statistical evaluation. Especially in recent years the growth of the market has been dramatic. In 1998, there were sixteen OPFs, with assets under management of 43.1 billion Euros. As of February 2009, the market had grown to thirty-five funds managing 82.1 billion Euros. The German OPF market is thus the biggest, and its market capitalization is about one-third of all European Union member countries.<sup>5</sup>

<sup>1</sup> The use of downside risk measures is important to combat potential biases that may result from the violation of the normality assumption for many return distributions (see Sing & Ong, 2000 for a detailed discussion).

<sup>2</sup> For a more detailed overview see the seminal paper by Sirmans and Worzala (2003), Benjamin, Sirmans, and Zietz (1995, 2001) and Hudson-Wilson, Gordon, Fabozzi, and Anson (2005).

<sup>3</sup> For a more detailed overview see also Worzala, Elaine and Sirmans (2003).

<sup>4</sup> See Investmentgesetz (InvG) and Klug (2008) for further details.

<sup>5</sup> According to data from the BVI Bundesverband Investment, Asset Management e.V. (German Asset Management and Investment Association), and Deutsche Bundesbank (German Central Bank).

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