Liquidity Pricing in Unlisted Real Estate Funds

Gianluca Marcato[1] and Giovanni Tira[2]

School of Real Estate & Planning
Henley Business School
University of Reading
Reading RG6 6UD

[Current Draft: 28 March 2010]

ABSTRACT

Traded securities have been mainly used to study the two-way causality between returns and liquidity in the finance literature. We argue that this issue is even more important for unlisted funds, particularly if they invest in very illiquid assets. Using the investment performance of UK Real Estate open-ended unlisted funds, we also analyze the impact of managerial, economical and investor variables on the pricing of real estate mutual funds. Our empirical results show that, on one hand, illiquidity is attached to a higher expected return as investors are willing to pay a price for liquid assets and, on the other hand, higher returns attract more investors driving liquidity up. Particularly, we find that overall transaction volumes contain little information unless we separate between inflows and outflows. Furthermore, we find that returns are influenced by the direction of flows (either buying or selling side) and that fund types and some asset manager's characteristics are not significant and should then play a minor role in the investment decision process. Finally, through a montecarlo simulation we show a smart-money effect where using this set of information to build portfolios of funds may have a significant impact on the likelihood of over-performing the benchmark.

[1] Email: g.marcato@henley.reading.ac.uk, Tel: +44 (0)118 378 8178, Fax: Tel: +44 (0)118 378 8172.
[2] Email: g.tira@student.reading.ac.uk, Tel: +44 (0)118 378 8175, Fax: Tel: +44 (0)118 378 8172.

Introduction

An investor wanting a portfolio exposure to real estate could achieve it through three main vehicles: direct investment, listed securities (i.e. REITs, CMBS, RMBS), or unlisted securities (i.e. total return swaps, or real estate funds). Direct investment requires a large amount of money and usually a wide knowledge of the market in all its segments. The listed securities market is an alternative which however offers a return/risk profile which is not much in line with the one of private real estate investment (i.e. it is more linked to either the equity – for REITs – or bond market – for MBS products. On the contrary, unlisted securities – and in particular real estate mutual funds (i.e. REMFs) – offer performance which are in line with the underlying market (i.e. the correlation coefficient between an investment in the direct market and in the unlisted funds index is bigger than 0.70).

REMFs are not exchanged in the stock market and can be set as a private partnership or a public collection of money. The main vehicles for the unlisted market are represented by limited partnerships (LP), Property unit trust (PUT) and managed funds. Our research focuses on the UK market, where the unlisted sector has been developed substantially, also thanks to the strict legislation that, until 2007, limited the proliferation of REIT structures in this market[3] .

If we look at the wider European unlisted market, we see that it includes 486 funds for a gross asset value (GAV) of 296.2 billion €. These funds are developed in different countries with a prevalence of UK that account more than 50% of the market with 189 funds and a GAV of 100.9 billion €, followed by Germany with 79 funds and a GAV of 87.7 billion €.

According to a classification made by the European associations for investors in unlisted real estate funds (INREV), depending upon the level of leverage and expected return, there are three different types of fund: core, value added (or core plus) and opportunistic. Core funds represent the majority of the unlisted market with 262 vehicles (more than 50%) for a GAV of € 196 billion. Value added funds are 157 and their GAV reaches € 66 billion. The market has followed a continued constant growth from a GAV of € 100 billion to a GAV of € 200 billion between 1998 and 2004, with the subsequent couple of years until 2006 showing a sharp development

[3] Although REITs first appear in 60s in US, it is relatively new for the British market. In fact the finance act of 2006, which came to effect in the 1st January 2007, firstly introduces the instrument of REIT in the UK market.

(from € 200 billion to almost € 300 billion), boosted by the exponential increase in opportunistic funds, to then remain constant until 2008[4].

The recent economic and financial crisis has revealed that liquidity plays a primary role in driving risk and return of real estate mutual funds. Although it is a common belief that liquidity influences the performance of a fund, as well as high performance attracts investment flows – creating a sort of loop with exponential consequences on both performance and flows – the winning causality between the two is not clear and needs further investigation because this double process tends to happen simultaneously. Since this debate has been explored in other contexts before, we can build upon previous literature to identify an appropriate method to test the reciprocal causality.

The aim of this project then is to analyse liquidity and other risk factors driving the pricing of real estate mutual funds, using a dataset of UK vehicles provided by IPD. The sample is composed by 71 funds and the sample period goes from 2005 to 2009. All funds invest in non-residential buildings located in the UK.

To study this issue we propose a Vector Autoregressive Model (VAR) using a panel data. Returns and flows are analyzed with a 4-lag structure which allows to test for one way causality going a year back in time – this is a standard procedure in previous works, as for example in Ling et al (2009). Particularly, we decide to look at flows with three different specifications:

- number of units;
- Net Asset Value (i.e. NAV);
- Percentage of the total number of unit in the fund (which is the same as percentage of total amount of NAV in the fund).

The first two specifications of flows look at liquidity in absolute values, while the latter tries to look at liquidity relatively to the outstanding units available in the market (this may be important as some small funds may show a small transaction volume if compared to bigger funds, but the impact on their performance may be larger if the transaction refers to a high percentage of the outstanding units available in the fund. Secondly, we compute flows in three different ways:

- net flows (as the difference between inflows and outflows) will signal the direction of transactions (more on either the buying or selling side);

[4] Source: INREV 2009

- inflows vs. outflows (tested separately) as buying vs. selling transactions may show a different impact / be influenced by returns differently;

- Transaction volumes as the overall transaction activity (and not only its direction as in the first formulation) may have an embedded signal.

Along with the two endogenous variables of total return and flows, in our VAR estimation, we also use other exogenous variables that we consider being important in explaining these two funds characteristics. These variables also function as control variables and have been chosen building on previous literature and considering the dataset available to the authors. Some examples are: fund dimension, leverage, cash, turnover, asset concentration, vintage, equity market returns, GDP growth, and outstanding redemptions. Finally we also add fund type and managerial variables to our model to test their relevance in explaining performance and transaction activity (e.g. specialized funds, INREV fund classification, bank group, other funds within the same group).

The paper is structured as follows: in the next section we will present a review of the main body of literature published so far on the issue of liquidity and asset pricing, not only for REMFs, but also for other instruments. In the following section we will introduce the database used in our empirical testing, the different type of risks we consider. In the final two sections we will present our main finding and draw some conclusions, suggesting further research.

Literature review

Chordia (1996) suggests that real estate mutual funds provide three main benefits to investors. Firstly, they offer diversification. Individual investors (and sometimes mutual funds themselves) cannot reach a desirable diversification in the real estate market because they do not possess enough resources; either those being enough money to be allow the purchase of several buildings, or expertise and knowledge in different market segments. According to IPD, the average price for a commercial property in the UK is £ 15 million. A good portfolio diversification could be achieved with 30 properties (Callender et al (2008) per segment (or sector or area). The amount of money to be raised would then necessarily be around £ 300 million, with clear difficulties for smaller investor (and private ones particularly if they wish to have a well-diversified multi-asset portfolio). Even if we think at shared ownership (let say 50%

of the value of the property), for an investor wishing to reach a reasonable diversification, this amount would still be too high (more than £ 100 million).

Secondly, mutual funds have lower transaction costs because buying and selling their units allow investors to save the high transaction costs registered for direct real estate investments – i.e. fees to real estate agents/brokers and transfer tax as applied when the transaction takes place (e.g. stamp duty in the UK market)[5]. This reduction of transaction costs and global cost has been first introduced by Gurley and Shaw (1960) and then re-analyzed by plenty of authors as Allen and Santomero (1996) or Brennan and Huges (1991), who demonstrate that brokerage commission decline with the dimension of transaction.

Thirdly, mutual funds enable investor to share liquidity risk. When investing individually investors bear the entire risk. In fact in addition to the investment risk embedded in the instrument, an investor can be forced to redeem due to personal liquidity needs. Let us analyze how mutual funds solve this problem throughout an example. Let's say that the price of a unit in a fund is £10. If the investor does not redeem at the end of his investment period, he/she will receive £11 back. If he/she redeems in any moment before the end of the investment, he/she will receive only £9.50 because of expenses and the fact the investment has not reached its maturity yet. Let us assume that the probability of redemption is 0.5. The expected investment wealth will then be 0.25 with a variance of 0.75^2.

[ENTER EXHIBIT 1 HERE]

If there are two investors, both with probability of redemption of 0.5, the scenario changes completely:

[ENTER EXHIBIT 2 HERE]

The expected return is exactly the same of investing individually but the risk has been reduced by 50%. The shared risk increases with the number of investors in a fund. This demonstrates that investing in Real Estate mutual fund reduces the risk, without affecting the return of the investment.

Allen and Carletti (2007) argue that in periods when liquidity plays an important role – as in the actual credit crunch – the price of assets reflects more the level of liquidity of the instrument

[5] However it is also worth mentioning that transaction costs will be actually paid by the fund when it buys and sells assets. Consequently the performance achieved by an investor in REMFs is already net of these costs (and they should also pay fees to enter/exit the fund on top of these ones.

than its expected future earnings. Therefore the liquidity of an instrument not only drives the performance but can also lead to distortions and contagion because funds are constrained to liquidate unnecessarily and, normally, most profitable assets.

The problem of liquidity is serious not only for the real estate market, but for mutual fund in general, as highlighted by Frazzini and Lamont (2008), Greene et al. (2007), Keswani and Stolin (2008), and Ivkovic and Weisenbenner (2009) among many. In particular Edelen (1998) shows that the performance of a fund is strictly connected to the flow in the fund: an increase or a decrease of flow of money in a fund moves the fund from the optimal portfolio and therefore force the manager to relocate assets. This operation is more difficult for REMFs, because of the illiquid assets in their portfolios. In fact, as suggested by Saint-Pierre (1990) the problem of liquidity for REMF has two layers: liquidity of the asset and liquidity of the fund.

The relationship between liquidity and fund performance is also inversely correlated and rolling. Ivkovic and Weisbenner (2008) show that players tend to redeem funds that had badly past performances and to invest in funds with positive past performance. Furthermore, Bergstresser and Poterba (2001) show that after-tax returns influence net fund flows, unrealized capital gain influences both in- and outflow (with greater effect on inflow) and past performance and past tax burden affect inflow.

In non listed open ended property fund the subscriber has the right to redeem its units at anytime and the manager has the duty to refund the investment. An INREV survey in May 2009 illustrates exit policies used by real estate mutual funds. Redemption options are offered by the whole population of open ended funds, and are surprisingly available for 8% of the closed ended funds (which is out of line with the definition of closed ended fund). In almost 70% of open ended funds it is also possible to trade units within the secondary market.

Although investors can exercise their redemption in any market condition, the manager cannot be able to generate sufficient liquidity to fulfil this request. Fund managers face this request in different way: reallocating shares to other investors in the fund (50% of the funds); first come first serve basis by setting a certain amount of redemption available (46%); in proportion of total request on the fund total assets (42%); raising short term debt-capital (40%); issuing new shares (29%). Funds can also incorporate a deferral or closure provision for these situations in order to raise liquidity for redemption (selling an asset (83%), increase leverage (12%), etc.). In the current period of crisis some funds have just shut the door to redeemer winding down the fund. In fact a fund easily incur in loss when it needs to liquidate an asset, in a market in which price and

demand has drastically fallen. In fact INREV illustrate that in the last 12 months redemptions in funds have been in range of more than 15% of the NAV. From our database we observed that a lot of funds are facing a high percentage of redemptions outstanding (up to the 79% of the size of the fund), and some funds have decided to change their policy from open to closed-ended fund (i.e. ING Retail property fund Brit, source: IPD).

Although the problem of REMF performance has not been widely explored, the risk driver factors analysis of mutual funds has been a fertile field for finance literature, and several models have been developed on this topic. For example Frazzini (2006) with a three-factor model analyzes the capital gains overhang in order to measure the abnormal return on losses. Furthermore Keswani and Stolin (2008) use a three- and four-factor model on the performance of actively managed UK funds in order to study the entity of alpha and lagged flow on performance.

As far as real estate markets are concerned, the vast majority of studies mainly look at the listed sector (i.e. REITs), particularly because datasets are public and therefore they are easily accessible for research. Among several attempts to price real estate vehicles – e.g. Liu and Mei (1992), Chui, Titman and Webb (2000), Mei and Hu (2000), Chan, Leung and Wang (2005), Gosh and Sirmans (2005), Devos, Ong and Spieler (2007) – we particularly follow Ooi, Ong and Li (2008) who study the likelihood of seven different events related to liquidity in a fund: no material change (passive, status quo); pure equity issues; equity repurchases; net debt issues; net debt retirement; dual issues; debt issues & equity repurchases; equity issues & debt retirement. Furthermore, Tuluca, Myer and Webb (2000) develop a comparative analysis on both REIT and listed REMFs to study the impact of asset returns (i.e. bonds, equities, listed and unlisted real estate) on the performance of these funds testing for different lag structures.

Even if it is not widely spread, part of the literature – Stevenson (2004), Lee and Stevenson (2006), Baum (2001), Ljunquist and Richardson (2003), Kaplan and Schoar(2005), Baun and Steffen (2009) – also analyzes driving factors in REMFs performances. In particular, O'Neal and Page (2000) develop a cross-sectional regression on the abnormal return of REMF using variables specific to the fund. They show that the age of the fund (proxy for funds experience), has a higher explanatory power than the manager's experience itself[6]. They also find that, after adjusting for other risks, actively managed REMFs have abnormal return higher than passive funds, proving that these types of instrument are to be preferred. A similar result is included in

[6] This results has been founded also by a survey from McKinsey with title "Insight from the Mc Kinsey Real-Estate survey 2008"

Gullet and Redman (2005) who analyse the Sharpe ratio of several types of funds. They analyze REMFs and their interaction with the stock market, finding a positive effect of correlation between fund returns and equity market on the fund performance. On the same line, Tomperi (2009) develops a model on REMFs finding that the RE market is driven by the same sentiment that drives equity markets. Furthermore fund performance is connected with fund size and age (younger fund managers are likely to achieve higher performances). With a slightly different idea Brounen et al (2007) explain that an increase of performance in equity markets leads to an increase in redemption within the real estate market that is simply considered as cash market with higher performance.

Data description

This paper uses the 'IPD Property Fund Vision' dataset for the UK market, a databank collected and provided to us by IPD (Investment Property Databank). It includes 83 UK real estate mutual funds, of which 70 are open ended and 13 closed ended. The sample period of our database starts in the first quarter of 2005 and finishes in the first quarter of 2009, for a potential total of 1,411 quarterly observations.

However, only 62 funds were originated before March 2005 and 21 funds have been issued after that date, among which only 3 after September 2007. For this reasons we do not have quarterly observations from the start to the end of the sample period for all our funds, but the actual number of observations is anyway around 1,100.

As reported in table 1, the total value of funds at the date of issue is around £ 50 billion, which represents 53% of the UK market and 20% of the European market[7]. At March 2009 the number of funds is diminished because some of them expired or entered in a winding down period, or simply because they were not willing to provide further data. Between the initial IPO and the final date, the leverage remained more or less at the same level, but the value of cash detained by funds increased in time (i.e. this is due to specific period within the cycle).

[INSERT EXHIBIT 3 HERE]

Funds in the database invest in commercial properties especially in Standard retail, shopping centres, retail warehouses, offices and industrial properties located in the UK. In the database

[7] Source: INREV

there are variables related to asset characteristics – e.g. portfolio distribution (both sector and region), lease length, top 10 investments, top 10 tenants and top 10 investors, rental information, asset turnover – and others more related to the fund level – debt information, redemption, fund price and total return.

We have decided to study only open ended funds (as the closed ended funds section is extremely smaller in that database and the pricing issue in the two types of funds differ) and to exclude funds with less than 5 observations because of the lag structure of 4 quarters we have decided to adopt in our VAR approach (e.g. some funds created in Q3 of 2008 were deleted from our database because 2 observations are not enough to run an autoregressive process of order 4). Therefore the 'cleaned' database is composed by 49 funds for a total amount of 686 quarterly observations. The NAV of the dataset is £ 28bn for a total value (GAV) of the database of £ 30bn. There are some differences between the first and last quarters of the sample: the total value of funds is diminished by 30% but it is diminished more in NAV, than cash (not changed) and leverage (which grows also thanks to the decrease in property values). The percentage growth in leverage, partially driven by the decrease in NAV represents already a strong signal of problems faced by the real estate unlisted market in recent periods.

Our dataset also includes different cross-sectional characteristics of market indexes such as FTSE 100 (equity market), IPD Property Pooled Fund Index (unlisted market), 90 day Treasury bill yield (risk free rate) and UK Gross Domestic Product (state of the economy). Figure 3 reports the main descriptive statistics of variables.

[INSERT EXHIBIT 4 HERE]

The total return has values between -45% and 20% with an average return being slightly negative. This is because after the third quarter 2008 the market incurred in severe losses and during the previous period was experiencing a steep expansion. This path is well represented by both standard deviation and Sharpe ratio: the first has a maximum value of 18% and the latter had a negative average figure. Funds in the dataset have a significant dimension with an average value of £ 666m and a leverage of £ 80m (12%). Obviously the average value of this variable has little meaning because we can find very big funds (more than £ 5bn) and several pension funds being core and not using leverage at all. The asset turnover for funds in the sample is quite high and on average is around 10%. This means that funds are actively managed, even if it is difficult to understand whether some of them are simply tracking a specific index. Some funds are both/either sector-specific and/or regionally concentrated as the Herfindahl index shows. Flows

have an average value of zero because in the first part of the sample funds experienced very few outflows and a constant inflow of money, while they recorded an outflow of money in the latter period. Outstanding outflows arrive at 74% of the total number of units in the fund.

Figure 6 represents, for the whole sample period, the maximum (blue) and minimum (red) cross-sectional total return in each quarter, the average performance of the market (3 months PPFI that corresponds to the average total return of our sample), the standard deviation of the sample and the performance of the stock market (FTSE 100). For graph readability we kept the scale from -40% to +20% and so we do not see the minimum total return of -89% in Q1 2009.

[INSERT EXHIBIT 5 HERE]

We can notice that the total return of real estate mutual funds was stable and consistent over the 2005 - 2007 period, with an increment in the standard deviation and in maximum total return around Q3 2005 due to the explosion of investments in this sector. After the real estate bubble, returns started to decrease and the economic stimulus act and the bankruptcy of Lehman Brothers have first raised and then decreased returns again in both the unlisted and the stock market. We can notice that real estate performance is lagging equity performance in the period 2005-2007 and after the credit crunch, they are moving together or sometimes real estate is anticipating stock market performance. This is given by the fact that valuers after the credit crunch have tried to anticipate the valuation shift and to update with more quickly their judgments in order to provide a well-timed trend of the market. The negative trend, followed to the decline in real estate performance begun in the first quarter of 2007 and not after the real estate bubble, as commonly believed. Looking at the standard deviation, we notice that it is stable until the second quarter of 2007 and then starts to increase exponentially after the credit crunch and particularly in conjunction with the bankruptcy of Lehmann Brothers.

Main variables

We build on Ghosh and Sirmans (2005) and divide our variables in endogenous (or directly controlled by the manager) and exogenous (not controlled by the fund manager in any manner). We also add a third category of variables – similar to the board structure variables in Ghosh and Sirmans (2005) – which is not completely either endogenous or exogenous and we call it investor variables set. We do not use any variables on tax transparency because the domicile of UK funds (i.e. Jersey, Ireland, etc.) reduces the exposure of funds to taxation.

Endogenous variables are proxy of the risk connected with the management of a fund: decisions of the management on investments, expenses or debt influence the performance of a fund and the risk a fund is taking. These variables depend on decisions made directly by the manager or by other players in the mutual fund. Among these variables we classify: fund size, debt, sector specialisation, assets turnover, fund investment and Vintage.

Exogenous variables represent a proxy for the risk connected with the economic time-environment in which a fund was issued: they are totally independent from individual decision but they impact on a fund performance and risk. Brounen, Veld and Raitio (2007) demonstrate that REMFs are seen as a cash alternative that provides a slightly higher return by some investors. In time of poor equity returns, REMFs experience a high inflow of capital. Other investors, in accordance with Gullet and Redman (2005), use these funds to reduce the risk of a wider portfolio, or as a low risk exposure to the real estate market. Among these variables, we classify stock market returns and growth in gross domestic product.

Investor variables[8] depend entirely neither on the manager's decision nor on the economic environment, but they are positioned in between. For example, in this category we find the flow of money, which is driven partly by the manager's ability (well managed fund attract more capital) and partly by the economic and financial situation of the market, but also by personal investors' needs (i.e. investors have liquidity functions that are independent on the performance of the fund). Among these variables we classify: inflows and outflows, property tenants, lease length and outstanding redemptions.

In the final part of this section we describe all the variables we use and state our assumptions about their impact on total returns and fund flows.

Leverage. The leverage is the amount of debt a fund is sustaining in percentage on the equity of that fund. We consider as equity the asset of the fund. Debt is a proxy for the level of risk: a high level of leverage indicates an increase of the risk in the fund due to the additional interest to be paid on the debt, but it also amplifies the performance of the fund due to dimension. The desired level of leverage for investor is 50% of the value of the properties although 20% is considered pointless and level over 75% too much risky. On the other hand managers claim that most of the performance of Real Estate mutual funds comes from gearing (Baum 2001). The leverage has an impact on both in-and outflow of investor from the funds, because its function

[8] Investor variables does not depend only on investor, but they have the same structure of the decision making process of an investor. For an investor decisions are based both on specific condition and economic condition and psychological or personal condition.(see also Kotler 2000)

of multiplier of the risk. Leverage has also a different effect on both new money and old money flow. Finally, leverage is rarely used to cover the equity loss given by redemptions in a fund: only 8% of the Real estate mutual funds use this opportunity (INREV 2009).

Performance. I consider the performance experienced by the Real estate mutual fund in the previous period. Previous studies such as Ivkovic and Weisbenner (2009) demonstrate that past mutual performance influence flows: they show that people sell funds that are incurring in losses and hold funds that are appreciated. Moreover other authors (Brounen, Op't Veld and Raitio 2007, Lizieri 2008) demonstrate that Real Estate mutual funds tend to have a reduced volatility compared to REITs or other mutual funds. This implies that past performances are a good indicator of future or actual performances, and therefore of risks connected to future performances such as redemptions.

Size. The size of an unlisted fund is the value of assets in that fund. It represents the dimension of a fund (it could be compared with the market capitalization of listed funds both Real Estate and non-Real Estate). It is represented by the total asset value of the fund. Both Schoar (2005) and Tomperi (2009) have demonstrated that larger private equity funds have a significantly higher realised risk-adjusted return. A big size of a fund reduces the risk for two directly consequences. First, a large size allows economies of scale and achieves a lower management expenses and trading costs (Gullet and Redman 2005, O'Neal and Page 2000). Secondly, have been demonstrated that big buildings, which usually belong to larger mutual funds, have been best-performing in 90s and early 00s (Baum 2001). The size of a fund could also lead to a better diversification, but it is not been proven by the literature that this effect is significant and consistent. This is because commonly we consider every fund well diversified, independently from the size.

Vintage. The vintage is the time measured in quarter from the creation of a fund and the quarter in which the fund is analyzed. Tomperi (2009) demonstrates that fund with higher sequence have a negative correlation with the performance of the fund supporting the idea that younger fund managers perform better than well established fund manager. Furthermore the age of the fund allow us to understand the time in which the core part of the assets were bought and it is a sort of proxy of the experience of the fund. Moreover O'neal and Page (2000) say that if it exist efficiencies that can be gained from management experience therefore the age of the fund must be directly correlated with the performance of the fund. Anyway they find a significant negative

impact of the age on the abnormal return of the fund, supporting the idea that do not exist efficiencies connected to the management experience, which means there is no experience effect in REMF.

Cash. The cash is the amount of assets detained as money or similar as a percentage of the total asset of the fund. Ling and Naranjo (2002) demonstrate that asset detained in cash does not provide any return to the fund, and therefore tend to reduce the performance. On the other side cash it is very useful to keep the fund flexible and capable to face small negative net flow of money. According to Goodchild (2009) REMF in different countries has different structure and different polices concerning the quantity of cash hold in the fund. For example the German REMFs are very flexible and they redeem investor on a daily pricing. In order to have this flexibility they detain between 5% and 50% in cash. US fund and UK fund (for institutional investor only), instead, has a portfolio done of solely properties. They are an exception funds that are backed for retail investor that have a liquid buffer, which is not identified as a fixed percentage, although many funds specify it in their information prospect. According to Baum (2001), instead, mutual funds tend to don't change their cash amount, because it is the first proxy of their ability to repay a debt for banks. Fund with higher cash reserves achieve easily loan from bank or can hope for a lower interest rate.

Asset concentration. The asset concentration is the number of assets multiplied per their value compared to the total value of the fund. Following an idea of Baun and Steffen (2009) this variable is calculated as a Herfindahl index. This variable expresses whether the concentration in term of number of assets in the fund is important. On one side the highly number of properties in a fund could provide positive effect given by an efficient diversification. On the other side as suggested from Maris and Segal (2002) bigger properties provide less risk, because usually are hold by wealthier owner and they are less likelihood to incur in a default.

Turnover. The turnover is the absolute sum of properties both buys and sold. It represents the movement of assets inside a fund. Following an idea of Marcato, Ling, and Mc Allister (2009), we use the turnover with a lag of one quarter. The single value of the turnover does not tell us whether the movement in a fund has been driven by a liquidity need or for a planned strategy. Notwithstanding the joint use of this variables with flows variables allow to track also this effect.

Equity. The equity market index represents the performance of the stock market. Because the majority of the funds included in the database are from the UK market I have included the London stock exchange index (FTSE 100) as equity market index. Brounen, Veld and Raitio (2007) demonstrated that Real estate mutual funds are sensitive to movements and to sentiment in the general equity market. In fact these vehicles are seen by investors as a cash alternative that provide a slightly higher return. In time of poor equity returns, Real estate mutual funds experience a high inflow of capital. Conversely, when the equity market is upturning they experience a massive outflow of capital. Therefore the performance of the equity market drives the redemption risk in Real Estate mutual funds and affects their risk-adjusted performance.

GDP. The gross domestic product indicates the production of a country in a given period. Ilka (2009) shows that mutual funds raised during period of slow economic activity are likely to have a better performance: the lower the GDP growth during the time of the fund launch the higher the realised IRR. In fact in period of strong GDP growth, the assets are already inflated and funds are forced to buy properties at a higher price. GDP modifies the risk-adjusted return of a fund and is a proxy for the consistence of investments (by country not just for the Real Estate market).

Net Flow. Net flow is obtained as the difference between the inflow (new money) and outflow (redemption) of money in a Real Estate mutual fund. It is a proxy for the liquidity of the fund. It could be either positive (more inflow than outflow) or negative (more redemptions than new money). Usually the Net flow is positive but since September 2007 outflows have climbed to records levels, outstripping cash inflows in Real Estate mutual funds (AREF 2008). As expressed previously, the liquidity risk is the main risk for a Real Estate mutual fund and strongly determines the performance of a fund. Indeed, Ljungqvist and Richardson (2003) documented that in a Real Estate funds it takes several for capital given by investors to be invested, and over ten years for that capital to reach the maturity (see also J curve), with great consequence in the performance of a fund if redemptions incur. In addition to what mentioned in previous chapters about the risk of redemption in Real Estate mutual funds Baum (2001) adds that advisors, investors and managers all agree that Real Estate unlisted vehicles are less liquid than buildings. In addiction, Tomperi (2009) argues that the inflow of a fund represents the proxy of the demand for private equity in the Real Estate market and could be simply obtained as the final fund size divided by the original target size of the fund. We considered three definitions of flows: number of unit, on the net asset value (NAV per unit times number of unit), and in percentage

on the total number of unit. The firs two definition of net flow, are looking at the problem in absolute term, taking into account the dimension of a fund. The latter definition is facing the problem in a relative way, re-sizing the problem for each fund. In the model net flow is considered also as in- and outflows, and as volume (sum of in- and outflows).

Outstanding redemptions. The redemption outstanding is the number of redemptions that have not been liquidated in the previous quarter and that will be liquidated in the actual quarter. In addition with net flow, it shows not only the flow of money in the fund, but also the expected flow of the next quarter. Outstanding redemptions are a data that is invisible to investor, but affect heavily the performance of the fund and the plan of the manager.

Specialisation. I want to study whether the fact that a fund is specialized or not matter on the risk-adjusted performance of a Real Estate mutual fund. Baum (2001) affirms that specialisation and focus are the two most important attributes for unlisted vehicles: they allowed exposure to property and property style which are difficult to access otherwise and they are a way to hand off difficult properties sector. They exist two different types of specialisation: specialisation by sector and specialisation by geographical distribution. Mutual funds in the database invest mainly in the UK so the geographic specialization will be considered between the different area of UK (South East, city, West end, and rest of UK). The different sectors in which the mutual funds in my database invest are: standard retails, shopping centres, retail warehouses, offices and industrial properties. Steffan and Baum (2009) have demonstrated that the specialization by sector has a greater impact on the risk-adjusted performance than the specialization by geographic distribution. Furthermore Glascock and Lynne (2007) proof that within a country it is more important the property type specialisation than the geographic. In accordance with them Jalabert and Schieven (2007) affirm that does not exist open ended fund with specialization within a single country. For these reasons I will consider only a property type specialization. To measure the specialisation of a fund I use the Herfindahl index on sector distribution. This index is a measure of the size of a category of investment (i.e. office, or south east) compared to the whole portfolio dimension and it is useful to understand the concentration of different properties due to the total dimension of the fund.

The following table summarizes the main variables used in our model.

[INSERT EXHIBIT 6 HERE]

Model and methodology

As showed in several papers – Allen and Carletti (2007), Bergstresser and Poterba (2001), Keswani and Stolin (2008), Frazzini (2006) among others –, liquidity is one of the main drivers of the performance in mutual funds. Data concerning flows are collected quarterly as sum of all events (i.e. in- and out-flows of units) occurred during the sample period. The performance depends on dividends and on NAV variation of a fund over a quarter. The problem of simultaneity of these effects arises, because we cannot exclude the possibility that these two variables are depending on each other due to liquidity pricing (i.e. investors willing to invest in illiquid assets only if they receive a premium) and return chasing behavior (i.e. liquidity increasing as performance improves and attracts new investors and then new capital). Ghosh and Sirmans (2005) were already discussing this issue of simultaneous effects using a 2SLS model. However, we decide to use a Vector autoregressive (VAR) model as in Ling, Marcato and Mc Allister (2009) to study the relationship between fund flows and real estate mutual funds returns. We use a VAR model with up to 4 lags (i.e. one year) with two endogenous variables: total returns and fund flows. In addition, other independent variables are used to control for other risk factors and to look at differences between fund types and management styles.

The IPD property fund vision is composed by a series of funds observed quarterly from the first quarter of 2005 until the first quarter of 2009. For this reason we decide to use a panel data approach with fixed effects that allows us to observe both the differences between funds and throughout quarters.

Moreover, we run a Wald test to check whether, in addition to the effects of independents variables, all four lags are jointly significant. Moreover the Wald test is used to identify whether returns are driving flows, or vice versa. Results of the Wald test for endogenous variables are included at the end of each estimation at the bottom of the table.

The empirical section is structured as follows: firstly, we analyze the relationship between total returns and transactions volume; secondly, we split between inflows and outflows; thirdly, we subtract outflows from inflows to obtain net flows (i.e. proxy for direction of flows). At the end of the section we finally introduce variables for fund type and fund manager's characteristics.

Empirical results

Previous studies using data on mutual funds documented that there is a strong correlation between performances and flows in a fund. More specifically we intend to explore the effect of three different specifications of flows on total return. First of all we decide to study the relationship between total returns and the absolute sum of flows in a fund that we call transactions volume. We expect a positive inter-temporal correlation between the two.

[INSERT EXHIBIT 7 HERE]

A fund performance is influenced by an autoregressive parameter of order 4 (excluding the 2 lags component). This result is consistent with the evidence – as in Kaplan and Scholar (2005) – that mutual funds have persistence in performances. Furthermore performance is negatively correlated with the size of a fund. This counter-intuitive result, however, is sustained and deeply analyzed by McKinsey (2009) stating that existing potential for economies of scale in the real estate market have not been fully captured yet.

In addition our estimation shows that returns are highly correlated with both leverage and cash. These two coefficients present a sign that is opposite to the one we may expect: on one hand leverage increases the performance of a mutual fund because it is a source for new investment (INREV 2009) and on the other hand cash should decrease returns because it represents money not invested in real estate and therefore not bringing additional return. These results are explained firstly by the fact that our sample period experiences substantially negative returns (with an average of -3%) given by market condition following the real estate turmoil in 2007. In fact funds with higher leverage have experienced higher losses because it was not possible for them to repay back their gearing. Moreover, funds with higher cash, managed to hedge losses with injection of capital in moments in which it was difficult to raise money in other way, i.e. either equity or loan, and kept a higher profile for investor and banks, when money returns to flow into the real estate market.

Furthermore the coefficient of the two macro economical variable, GDP and Equity, is significant. The positive effect of the equity market on REMF returns shows that these two markets are positively related and do not work as substitute (i.e. when there is money available in the economy, both markets benefit from it). In the recent crisis we have experienced that a high loss of performance in the real estate market was simultaneous to a similar loss in equity markets. Instead, as Tomperi (2009) suggests, the negative effect of GDP on return in mutual fund is

given by the fact that funds initiated during periods of slow economic activity are likely to have better performance.

Finally returns are negatively correlated with outstanding redemptions. In fact, funds with a higher number of redemptions and waiting to be brought forward are constrained during that quarter: funds are often obliged to sell assets in bad market conditions due to their need of liquidity driven by demand in outflows. Furthermore returns are not impacted by any lag of transaction volumes and by turnover, asset concentration and age of the fund. This confirms that there is no illiquidity pricing as far as overall transaction volumes of funds are concerned.

Similarly, volumes show significant autoregressive parameters, with all lag coefficients being positive. This shows that investments in mutual funds tend to follow a trend. In fact, according to McKinsey (2009), 83% of investors in real estate are institutional and, since they tend to plan their investment on a long-term basis and increase (decrease) their investment constantly over time we also expect persistence in fund flows.

The only other three significant coefficients are cash, asset concentration and outstanding redemptions. The positive coefficient of cash is still related to the flexibility of funds with higher availability of liquidity. Furthermore asset concentration has a negative effect showing that funds that tend not to use diversification in their portfolio attract less capital, because investors perceive a bad risk management. In addition, the negative coefficient of outstanding redemptions shows that funds with high requests for redemptions still on hold neither attract new capital (because investor are worried of the possibility of their units not being redeemed and they identify this higher level of redemptions as a sign of bad management), nor they increase redemptions (because they are bound to the ones waiting to be satisfied first).

The Wald test on the joint significance of the four lags reveals that both transaction volumes and returns have autoregressive parameter, but there is no illiquidity premium in REMF and no return chasing behaviour – at least if the direction of flows is not known as in Ling, Marcato and McAllister (2009). Therefore overall transaction volumes do not contain any information regarding returns, neither in term of pricing nor as a predictor of future flows.

We then decide to split transaction volumes into two components representing flows of money going into (inflows) and out of (outflows) a fund. This split allows us to understand whether there is a specific link between returns and one or the other, as well as to study the money smart

effect Kewsani and Stolin (2008) find in the UK market and Frazzini and Lomont (2008) find in real estate markets.

[INSERT EXHIBIT 8 HERE]

From Exhibit 8 we can be infer that total returns are not driven by any lag of either inflows and outflows, with the exception of half-yearly lagged inflows. Moreover, the sign and magnitude of coefficients of other variables are similar to previous results. The R-squared is also not substantially different from the one before and our model explains 68% of the variance of performances.

As far as inflows are concerned, instead, we notice that they are influenced by total returns – even if the effect is not persistent in all three estimations – lagged outflows and they show an autoregressive component. Moreover inflows have a negative relationship with turnover showing that active managed funds do not attract new flows of money. This effect is explained by the fact that during our sample period many funds were forced to sell the best assets in order to achieve their need of liquidity, whilst investors in fund do not appreciate this forced turnover because it causes a loss of fund performance. This money smart effect is not sustained by the effect of the coefficient of leverage. In fact leverage has a positive effect, i.e. investors perceive funds with higher leverage as more attractive because of their higher potential gains. The same could be said for outflows that have a strong negative correlation with leverage, showing that this idea concerning high leveraged funds makes the investor feel trustful in future performances, and therefore they do not exit from the fund.

The positive effect of cash, instead, is caught by both inflows and outflows. Although this effect was expected for inflows – because funds with higher cash reserve have more flexibility in periods of market turbulence – the same effect was not expected for outflows: old money investors perceive a cash buffer as a loss for the fund, because it does not produce additional performance. Furthermore vintage is positively correlated with inflows, meaning that investors value a fund's experience (i.e. funds originated before in time have additional experience compared to younger funds, and therefore they can achieve additional performances).

Moreover both coefficients of asset concentration and outstanding redemptions are significant only for outflows. The negative effect of asset concentration on outflows suggests that funds with less diversification make redemptions diminish. The same result given by outstanding redemptions suggests that the long line of redemptions on go work as a placebo for the existing investor. These counter-intuitive results, as well as previous results concerning both inflows and

outflows – confirm the findings of Keswani and Stolin (2008) who showed a money smart effect, but only on the buying side. Moreover, these results are consistent with results in Ivkovic and Lomont (2009), where investors tend to sell funds that are incurring in losses and hold funds that are appreciated.

Finally we can see that outflows (third column of each estimation results) only have an autoregressive component, but are neither significantly determined by total returns nor by inflows. Coefficients of outflows and inflows are positive and small in magnitude. These results are consistent with the suggestion in Brounen (2007) that open ended real estate mutual funds tend to have a reduced volatility, excluding periods of turmoil in which volatility is simply a function of the global volatility.

As previously, we use a Wald test for the joint significance of the lagged variables (we decided to omit the joint effect of two variables on the third one because it is always not significant). Similarly to transaction volumes, total return and both inflows and outflows have a strong autoregressive parameter and there is no illiquidity premium in a fund performance even if we split between incoming and outgoing flows. However differently from the case with transaction volumes, we find that return chasing behaviour occurs for inflows (but not for outflows) which are significantly determined by REMF returns. This result means that a higher performance attracts more capital inside a fund, while investors do not tend to leave the fund – expecting for a future recovery – when the fund is performing badly. Furthermore, inflows are also driven by outflows positively and this shows the fact that there is a tendency to match the request for redemptions and new entries in a fund. This procedure avoids the change in equity or cash, and therefore hedges the fund against the need of selling or buying new assets in not favourable market conditions. In other words, the performance of a fund is not driven by either inflows or outflows because investors prefer to hold long positions in mutual funds. Instead better performing funds attract new capital and the preferable option used by managers and investors is to trade units instead of redeeming them[9].

In our final step of fund flows analysis, we intend to study the direction of flows, using a new variable (netflows) which is computed as inflow minus outflows. This last part of our analysis

[9] According to INREV over 87% of core style fund offer the possibility to trading as well as over 94% of value added style fund. Only the 8% of opportunistic style fund offer this possibility

allows us to understand whether the direction of capital flows contains information and towards which direction (i.e. either flows determining performance or performance attracting flows).

[INSERT EXHIBIT 9 HERE]

Our results in Exhibit 9 suggest that returns have a strong autoregressive component and this result is consistent with the previous two sets of findings. In addition, returns are negatively correlated with netflows within the previous year. This result is consistent for all the three models even if is weakening when the direction is considered using NAV and not number of units in a fund.

Although the effect of variables on performances is similar to the previous models, we can see a substantial difference for fund size. In fact, size is not significant in the first two formulations of our models, but it becomes significant when we consider flows as a turnover ratio (i.e. percentage of the total NAV / number of units available in a fund).

Moreover, netflows show different results when compared to the previous two measures of liquidity. Along with a strongly significant autoregressive parameter with all lagged coefficients being positive and small in magnitude, netflows are not significantly determined by returns for the two absolute measures (in NAV and number of units), but they are when a relative measure (i.e. percentage of overall available NAV or number of units, third model in Exhibit 10) is considered. Netflows are also positively driven by leverage, suggesting that a significant level of leverage – or changes in capital structure in a fund – determine the direction of flows in a fund. This result is consistent with what evidenced in the model with both inflows and outflows where a high level of leverage attracted more funds and decreased redemptions. Furthermore netflows have a significant correlation with outstanding redemptions, showing that ongoing redemptions affect the direction of money flows either into or out of a fund.

Finally, the Wald test for the joint significance of lagged variables on return and netflows shows that both performances and netflows have an autoregressive component, with returns being driven by the direction of flows for the two first models, but not where a relative to size measure of liquidity (i.e. percentage) is used. This means that returns are driven by net flows if we also consider the fund size. In fact if we plot flows (x axis) against returns (y axis) in a graph, we would find is a positively concave function defined between zero and infinite (or better the maxim amount of NAV or units which is possible to trade in any fund) for positive netflows (i.e. inflows dominate) and a negatively concave function defined between zero and minus infinite (or better minus the maxim amount of NAV or units which is possible to trade in any fund) for

negative netflows (i.e. outflows dominate). The smaller the fund is, the steeper the function would be: the flat part of the function is shorter and the maxim of NAV/units which can be sold is nearer zero. This shows that the same movement in volumes between two differently sized funds may lead to a different effect on the return/price because the relative value of volumes would be bigger for a smaller fund. This result is supported by the effect the variable size has in our model: it is not significant in the first two models while it becomes significant in the third one (with flows in percentage). Moreover net flows are not driven by performances although in our third model they are just significant at a 90% confidence level. In conclusion there is no pricing and there is return chasing. To exchange 50% of a fund (vs. 10%) does not matter because a 50% trade on a 2 million fund doesn't convey the same information as a 50% trade on a 2 billion fund.

Fund Types and Managerial Characteristics

To conclude we introduce other two classes of variables. Fund types are represented by dummy variables identifying the nature of a fund and not changing over time. Among these variables, we have the INREV fund style classification (i.e. core, value added and opportunistic funds), and specialized fund[10] (looking at the diversification level). In the model we only use two of three dummy variables for fund style and we keep core funds as the base case scenario. Moreover, since INREV uses leverage as one of the variables used to define the three types of fund, we then omit leverage from our model not to double count it (i.e. possible multicollinearity). For managerial characteristics, we have identified variables allowing us to understand whether the influence of the asset manager matters or not: bank group, other fund and company value. 'Bank group' is a dummy being 1 if a fund is managed by a bank group or 0 otherwise. We expect that managers working within a big banking group are more experienced or at least have more accessibility to funding, more instruments to support their decision making and therefore should provide a higher performance. 'Other funds' represents a dummy variable being 1 if a fund is issued by a company that has already issued another fund or 0 otherwise. In this case we are testing the learning curve of the manager and therefore the know-how accumulated over time. Finally, 'company value' is a different proxy of the size of a fund, and it is created as the sum of the value of funds belonging to the same company. Many mutual funds are managed by the same asset manager or by the same group of asset managers. Therefore we want to test if there are

[10] Specialised fund variable are explained above in the paper at section "main variables"

specific strategies among a company or if funds jointly managed in a big group are successful. When this variable is used, the size of the fund is omitted from the model for clear issues of multicollinearity.

[INSERT EXHIBIT 10 HERE]

Exhibit 10 shows that the coefficient for specialized funds is significant and negative for both in- and outflows but it is not for netflows. This result means that funds with high specialisation in a sector attract less money but at the same time are not actively exchanged because of the jointly effect of negative volume, negative outflows and not significant netflows which show insignificance. These results along with results concerning asset concentration in a mutual fund show that investors in REMFs are sensitive to the diversification choice decided by funds.

Moreover opportunistic funds are highly significant in all models, but only for total returns. The negative effect of this variable, along with the negative (even if not significant) effect of the coefficient for value added funds, shows that, as the risk/return profile of funds increases, the relative performance diminishes (i.e. value added up to -1.4% opportunistic up to -4.2%). This result is consistent in the three models, and it results to be negative as the overall sample period had negative returns on average (i.e. higher risk means higher absolute return, being either positive or negative depending upon the cycle).

Finally, no managerial characteristic is significant in any of the three different models for each measure of fund flows (i.e. transaction volumes, inflows and outflows, netflows). This result may suggest that the learning curve or accessibility to funds within the same banking group do not seem to improve performances and or attract more funds.

Conclusions

The real estate unlisted market is a growing investment opportunity worldwide. Notwithstanding its high profitability, little research has been carried out on asset pricing to understand the nature of its performance. We have analyzed the risk factors of UK real estate mutual funds, with a particular focus on the relationship between performance and liquidity. Our sample period (i.e. 2005-2009) is mainly dominated by the recent economic crisis and shows an average negative return and an increased volatility.

Following the work of Gosh and Sirmans (2005), we identify endogenous, exogenous, investor's and managerial variables, connected with the risk and performance of mutual funds. We give three different definitions of flows using either NAV or number of units exchanged at each measurement point and we then classified liquidity in three ways: inflows and outflows, overall transaction volumes (i.e. the sum of the two) and netflows (i.e. the difference between the two).

Following a panel data VAR approach as in Ling, Marcato and Mc Allister (2009), we find that transaction volumes contain little information and are not enhanced by higher fund performances. However, if we distinguish between flows coming into or going out of a fund, we see that illiquidity is not priced, but inflows are affected by past performance (i.e. return chasing behaviour by investors) and money flowing out of funds (i.e. for mutual funds the most common form of redemptions is the trading of units between new comers and out goers. Finally we show that returns are influenced by directions of flows in a fund but only when we consider the absolute flow of money. In fact we demonstrate that the fund size is significant because changes in capital within a fund have a different impact on the price depending upon the dimension of the fund that is experiencing this differential variation.

Generally the Adjusted R-squared of our estimations is consistent and shows an average of 68% for the total return equation, 30% for net flows, 40% for both inflows and outflows, and 50% for transaction volumes.

All other variables included in our model tend to have a similar sign and significance in all estimations (with changes in the flows equation because of a different measure of flows we use in our exercise). Particularly, we notice the importance of leverage which is strongly significant for total returns, net flows and outflows. The negative sign of the coefficient in the total return model is due to the sample period we used (i.e. funds with higher leverage tended to experience higher losses).

A similar result is given by cash (with a 1 quarter lag), which is significant for almost every dependent variable. The positive effect on the return – even if it would have been expected to be negative – reveals the possibility of a real option value in the cash figure if the fund managers were to invest in projects with positive NPV.

Another interesting result refers to the macroeconomic and financial variables (GDP and equity) which appear to be strongly significant for total returns but not for fund flows. We conclude that the market cycle drives fund performances, but do not cause changes in investment behaviour after accounting for all other factors.

Furthermore, focusing on the analysis with inflows and outflows, we notice that our results confirm the intuitions given in Frazzini and Lomont (2008) who find that in the UK market there is a money smart effect among individuals and institutional investors, but only on the buying side (i.e. the significant coefficient for the model using inflows confirms theoretical expectations, while the one on the outflows does not).

Finally, if we consider the results of fund types and managerial characteristics, we find that only opportunistic funds are strongly significant in all models. In particular the estimation shows that, while value added and core funds are not significantly different, opportunistic funds showed a higher performance in absolute returns (negative coefficient of -4.2% for a sample period with average negative returns), after paying for all the embedded risks.

The next step of this research stream would be in the direction of trying to see if these risk factors can be used to construct trading rules which are able to generate over-performance consistently over time. A montecarlo simulation of randomly generated portfolios among the ones ranked first according to the characteristics previously identified could be benchmarked against a naïve investment strategy where an equal proportion of the portfolio is used to invest in each fund available in the market. If results are significant, then, investors may use these trading rules to achieve a higher performance.

References

Achour D., Brown R., and Roy Y., 1984. "Investment performance of Canadian Real Estate stocks using Sharpe's performance index" *Managerial and Decision Economics Vol.5, No. 3*

Allen, F., Carletti, E., 2008. "Market-to-market accounting and liquidity pricing". *Journal of Accounting and Economics 45 (2008) 358-378*

Barber, B.M., 1996. "Forecasting the discount of market prices from appraised values for Real Estate Limited Partnerships". *Real Estate Economics V24 4:pp.471-491.*

Baum, A., 2001. "Liquidity and private property vehicles: where next?" *Invesco Real Estate adviser*

Bergstresser, D., Poterba J., 2001. " Do after-tax returns affect mutual fund inflows?" *Journal of Financial Economics 63 (2002) 381-414*

Biasin, M., Giacomini E., and Quaranta A.G., 2009. "Italian public REITs' governance structure and NAV Discount". *Draft from ERES 2009*

Bond, S. A., Steffen S., 2009. "The effect of focus on the performance of German mutual Real Estate funds". *Draft from ERES 2009*

Brandi, J.T., 2000."Sharpe/Treynor performance attribution model: A practioner's approach to using the Sharpe and Treynor reward to risk ratios". *Journal of pension Planning&Compliance*

Brennan, M.J., Hughes P., 1991."Stock prices and the supply of information". *Journal of Finance 46, 1665-1691*

Brounen, D., H. Op't Veld, Raitio V., 2007. "Transparency in the European non-listed Real Estate funds market". *Journal of Real Estate Portfolio Management Vol. 13, No. 2*

Callender M., Devaney S., Sheahan A., Key T. (2007): "Risk Reduction and Diversification in UK Commercial Property Portfolios", *Journal of Property Research*, 24(4), pp. 355-375.

Carhart, M.M., Carpenter J.N., Lynch A.W., Musto D.K., 2002. "Mutual fund survivorship". *The Review of Financial Studies Winter 2002 Vol 15, No. 5, pp. 1439 - 1463*

Chan, S. H., Leung W. K., and Wang K., 2005. "Changes in REIT structure and stock performance: evidence from the Monday stock anomaly" *Real Estate Economics V33 1:pp. 89-120*

Chordia, T., 1996. "The structure of mutual fund charges". *Journal of Financial Economics 41 (1996) 3-39*

Chui, A. C. W., Titman S., and Wei K. C. J., 2003. "The cross section of expected REIT returns". *Real Estate Economics V31 3: pp.451-479*

Devos, E., Eng Ong S., Spieler A.C., 2007 "Analyst activity and firm value: evidence from the REIT sector". *Journal of Real Estate Finance and Economics Vol.35, No.3*

Doukas, J. A., Kim C., and Pantzalis C., 2000. "Security analysis, agency costs, and company characteristics". *Financial Analyst Journal.*

Edelen, R.M., 1999."Investor flows and the assessed performance of open-ended mutual funds". *Journal of Financial Economics 53 (1999) 439-466*

Elton, E. J., Gruber M. J., and Blake C.R., 1996. "Survivorship bias and mutual fund performance". *The review of Financial Studies Vol. 9, No. 4, pp. 1097-1120*

Frazzini, A., 2006. "The disposition effect and under-reaction to news". *Journal of Finance 61, 2017-2046*

Frazzini, A., Lamont O.A., 2008. " Dumb money: Mutual fund flows and the cross-section of stock returns" *Journal of Financial Economics 88 (2008) 299-322*

Ghosh, C., and Sirmans C.F., 2005." On REIT CEO compensation: does board structure matter?" *The Journal of Real Estate Finance and Economics, 30:4, 397-428*

Grabenwarter, U., and Weidig T., 2005." Exposed to the J-curve, understanding and managing private equity fund investments" *Euromoney books London*

Greene, J. T., Hodges C.W., and Rakowski D.A., 2007. "Daily mutual fund flows and redemption policies". *Journal of Banking and Finance 31 (2007) 3822-3842*

Gullet, N.S., and Redman A.L., 2005. "Do Real Estate mutual funds enhance portfolio returns and reduce portfolio risk?". *Briefings in Real Estate Finance 5: 51-66*

Ivkovic, Z., and Weisbenner S., 2009. "Individual investor mutual fund flows" *Journal of Financial Economics 92 (2009) 223-237*

Jobson, J. D., and Korkie M. B., 1981. "The performance hypothesis testing with the Sharpe and Treynor measures" *The Journal of Finance(September)*

Kallberg, J. G., Liu C.L., and Trzcinka C., 2000 "The value added from investment managers: an examination of funds of REITs". *Journal of Financial and Quantitative Analysis Vol.35, No.3*

Keswani, A., Stolin D., 2008. "Which money is smart? Mutual fund buys and sells of individual and institutional investors". *The Journal of Finance* Vol. LXIII, No.1

Ling D., Marcato G. and McAllister P. (2009): "The Dynamics of Asset Prices, Capital Flows, and Transaction Activity in Illiquid, Informational Inefficient, Commercial Real Estate Markets", *Journal of Real Estate Finance and Economics*, 39(3), pp. 359-383.

Ling, D.C., Naranjo A., 2002."Commercial Real Estate return performance: a cross-country analysis" *Journal of Real Estate Finance and Economics, 24:1/2, 119-142*

Liu, C. H., and Mei J., 1992. "The predictability of returns on equity REITs and their co-movement with other assets". *Journal of real Estate Finance and Economics, 5: 401-418*

Mei, J.J.P., and Hu J., 2000. "Conditional risk premiums of asian Real Estate stocks". *Journal of Real Estate Finance and Economics, 21:3, 297-313, 2000*

Morey, M. R., and Morey R. C., 2000. " An analytical confidence interval for the Treynor index: formula, conditions and properties" *Journal of Business Finance and Accounting 27 (1)&(2), 0306-686X*

O'Neal, E.S.,Page D.E., 2000. "Real Estate mutual funds: abnormal performance and fund characteristics". *Journal of Real Estate Portfolio Management Vol. 6,No. 3*

Roll, R., 1978 "Ambiguity when performance is measured by the securities market line" *Journal of Finance (September)*

Subrahmanyam, A., 2007. "Liquidity, return and order-flow linkages between Reits and the stock market". *Real Estate Economics V35 3:pp. 383-408*

Tomperi, I., 2009."Perfromance of Private equity Real Estate funds". *Draft from ERES 2009*

Tuluca, S. A., Myer F. C. N., and Webb J. R., 2000. "Dynamics of private and public Real Estate markets" *Journal of Real Estate Finance and Economics, 21:3, 279-296*

Exhibits

Exhibit 1: One investor's scenario.

Price	£10.00
Final Price	£11.00
Redemption value	£9.50
Expected wealth	0.5*(11-10)+0.5*(9.5-10)=0.25
Variance	0.5*(1-0.25)^2+0.5*(0.5+0.25)^2=(0.75)^2

Exhibit 2: Two investors' scenario.

Event	Probability	Payoff per investor
No redemption	0.25	(11-10)*0.5+(11-10)*0.5 = 1
One redemption	0.5	[(11-10)*0.5+(9.5-10)*0.5]*0.5 = 0.25
Two redemption	0.25	(9.5-10)*0.5+(9.5-10)*0.5 = -0.5
Expected wealth	0.25*(1)+0.5*(0.25)+0.25*(-0.5)=0.25	
Variance	0.25*(1-0.25)^2+0.5(0.25-0.25)^2+0.25*(0.5+0.25)^2=0.5*(0.75)^2	

Exhibit 3: Characteristics of the main dataset used in this study.

		Number	Value (£bn)	NAV (£bn)	Leverage(£bn)	Cash(£bn)
Issue	Open ended	70	36.918	30.074	5.044	1.8
	Closed ended	13	11.531	6.205	5.191	0.135
	Total	83	48.449	36.279	10.235	1.935
Mar-09	Open ended	66	31.393	23.53	5.943	1.92
	Closed ended	11	8.029	3.44	4.33	0.259
	Total	77	39.422	26.97	10.273	2.179
Dataset (Dec-05)		49	29.56	28.00	3.70	1.40
Dataset (Mar-09)		49	20.42	18.87	4.07	1.39
Total UK (Mar-09)		188	91.16			
Unlisted market (Mar-09)		488	256.9			

Exhibit 4: Main descriptive statistics.

Variable	*Mean*	*Median*	*Minimum*	*Maximum*	*Std. Dev.*	*C.V.*	*Skewness*	*Ex. kurtosis*
TOTAL RETURN	-1.70%	1.20%	-60.09%	20.16%	0.09	5.06	-1.94	6.53
SIZE (m£)	606.45	376.90	28.62	5162.24	695.58	1.15	2.59	8.94
DEBT (m£)	98.50	21.32	0.00	1106.80	169.93	1.73	2.63	8.22
CASH (m£)	31.24	9.04	-0.77	633.46	61.20	1.96	4.88	33.93
NAV (m£)	559.68	353.93	14.96	4202.97	624.06	1.12	2.31	6.36
VOLUME (m)	11.33	0.01	0.00	36.14	690.00	3.18	5.04	32.40
EQUITY	-1.61%	-0.17%	-14.08%	5.58%	0.06	3.65	-0.86	-0.31
GDP	2.44%	2.56%	1.53%	3.49%	0.01	0.25	0.12	-0.89
ASSET CONC. (H)	8.28%	4.04%	0.00%	100.00%	0.17	2.07	4.85	23.07
NET FLOW	1.74%	0.00%	-30.69%	62.68%	0.09	4.91	4.55	35.73
IN FLOW	3.24%	0.02%	0.00%	62.68%	0.11	3.42	12.51	207.17
OUT FLOW	1.40%	0.00%	0.00%	36.26%	0.03	2.47	4.27	25.06
REDEMPTIONS OUT.	1.25%	0.00%	0.00%	72.13%	0.06	4.94	6.01	40.59
VOLUME	0.05%	0.86%	0.00%	200.00%	0.12	2.50	10.74	167.22
VINTAGE (Q)	45.88	28.00	0.00	169.00	47.59	1.04	1.23	0.25
TURNOVER	6.07%	1.96%	0.00%	111.11%	0.11	1.87	4.05	22.60
LEVERAGE	27.88%	5.19%	0.00%	268.54%	0.43	1.55	1.86	3.42
CASH	5.69%	2.59%	0.00%	56.52%	0.08	1.40	2.61	8.40

Figure : summary statistics from 71 UK funds between March 2005 and March 2009 with quarterly data. The variables are shown in percentage (%), in millions of pound (m£), or in Herfindahl index (H). Debt, Cash, and NAV are not used in the estimation of the model (Debt and Cash are used in percentage), but are inserted in this table to provide a dimension of funds in the sample.Flows of the fund (Net flow, in and outflow and redemptions outstanding) are expressed in percentage on the total dimension of the fund. Flow variables have 0 as median, because the event of a flow in a Real Estate mutual fund is not frequent. Asset concentration has 0 as minimum value because it cannot assume negative value (Herfindahl is a square sum and lease length is a percentage of distribution of the portfolio). Turnover percentages are given as sum of total value of properties sold and acquired in the quarter (could be then higher than 100%). Vintage value of 0 represent the fact that some funds have been originated during the sample.

Exhibit 5: PPFI Total return and standard deviation of the sample. (Source: IPD)

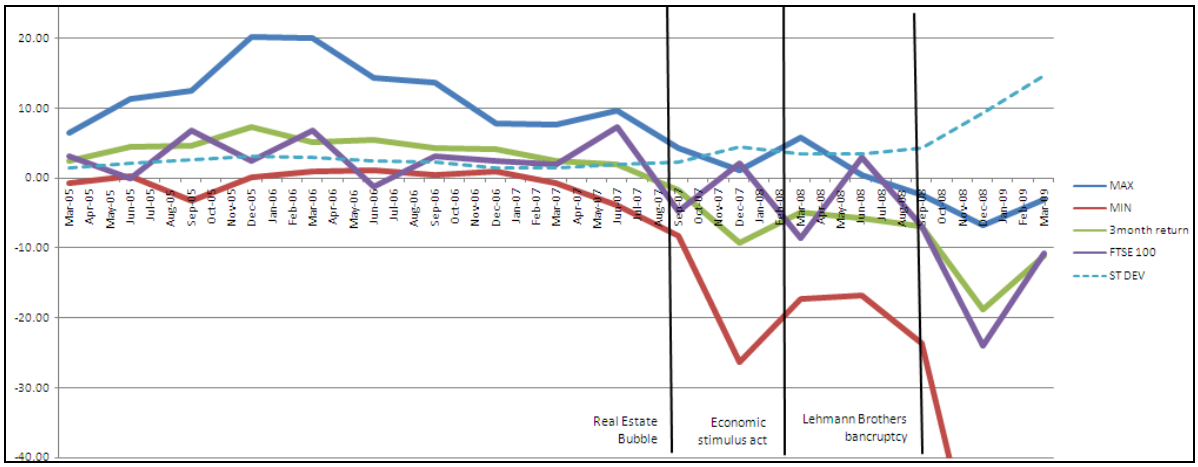

Exhibit 6: Main variables used in our simulation.

Variables	*Definition*	*Effect on performance*	*Effect on risk*
Manager variables			
SIZE	Dimension of the fund given by Assets on the balance sheet: the sum of Nav, Cash, listed investment and other assets liabilities. Expressed as a natural logarithm	Positive	Negative
LEVERAGE	Total debt of the funds at the istant t. Percentage obtained on the total size of the fund.	Positive	Positive
SECSPE	Herfindahl (%) index of division of the asset per sector (office, standard retail, shopping center, retail warehouse, industrial). Dummy on specialised fund	Ambiguos	Ambiguos
CASH	Amount of assets that are hold in cash or similar on the total value of asset, expressed as a percentage.	Negative	Positive
TURNOVER	Purchase and disposal of assets in percentage on the total value of the assets in the fund	Positive	Positive
ASSET CONCENTRATION	Herfindahl (%) index of number of assets per value of the asset on the total value of the assets	Ambiguos	Positive
VINTAGE	Number of quarte from the creation of the fund and the querter of analysis, express as a percentage.	Negative	Ambiguos
Economic Variable			
EQUITY	FTSE 100, performance on the monthly open price expressed as	Negative	Positive
GDP	Gross domestic product of UK (it is the unique country in which the fund invest). Natural log of millions of pound.	Positive	Negative
Investor variable			
NET FLOW	Inflow minus the outflow quarterly. Tested also inflow and outflow	Negative	Positive
REDOUT	Redemption do be honorated in the next quarter, or not redeemed in the previous quarter.	Negative	Positive

Exhibit 7: Total return and transaction volume.

	TR	VOL	TR	VOL (NAV)	TR	VOL (%)
TR(-1)	0.207***	5.029	0.202***	3.939	0.222***	0.072
	4.404	*1.325*	4.265	*0.900*	*4.724*	*1.498*
TR(-2)	0.051	-0.285	0.056	-0.735	0.051	0.063
	0.894	*-0.285*	*0.956*	*-0.735*	*0.880*	*0.063*
TR(-3)	0.494***	2.682	0.496***	3.759	0.495***	-0.083
	8.406	*0.565*	*8.337*	*0.684*	*8.355*	*-1.361*
TR(-4)	0.396***	-5.596	0.392***	-7.498	0.402***	-0.005
	5.980	*-1.046*	*5.876*	*-1.217*	*6.050*	*-0.068*
VOLUME_LN(-1)	0	0.387***	0	0.349***	0.056	0.256***
	0.625	*10.002*	*0.246*	*8.950*	*1.425*	*6.381*
VOLUME_LN(-2)	0.001	0.139***	0.001	0.149***	0.016	0.092**
	1.247	*3.492*	*1.597*	*3.622*	*0.436*	*2.483*
VOLUME_LN(-3)	0	0.169***	0	0.12***	-0.006	0.153***
	-0.612	*4.403*	*-0.743*	*3.013*	*-0.176*	*4.684*
VOLUME_LN(-4)	-0.001	0.133***	-0.001	0.112***	-0.034	-0.023
	-1.292	*3.693*	-1.305	*3.034*	*-1.607*	*-1.059*
C	0.117***	-0.24	0.115***	3.709	0.096**	-0.063
	2.821	*-0.071*	2.752	*0.957*	*2.381*	*-1.541*
LOG_ASSET	-0.004**	0.139	-0.004**	-0.006	-0.003*	0.003
	-2.129	*0.854*	-2.066	*-0.033*	*-1.741*	*1.460*
TURNOVER (-1)	0.018	-3.694**	0.018	-3.788**	0.023	-0.021
	0.862	*-2.247*	0.869	*-2.023*	*1.031*	*-0.926*
LEVERAGE (-1)	-0.049***	-0.661	-0.05***	-1.374**	-0.047***	0.006
	-8.228	*-1.376*	-8.120	*-2.432*	*-8.273*	*1.037*
CASH (-1)	0.07**	9.406***	0.073**	7.902***	0.074***	0.138***
	2.297	*3.812*	2.397	*2.816*	*2.522*	*4.589*
ASSET CONC.	-0.003	-1.608*	-0.004	-2.939***	-0.001	-0.01
	-0.238	*-1.681*	*-0.305*	*-2.617*	*-0.076*	*-0.892*
VINTAGE_QUARTER	0.00002	0.003	0	0.009**	0	0
	0.518	*0.937*	*0.551*	*2.281*	*0.385*	*0.986*
EQUITY	0.34***	2.934	0.345***	5.252	0.324***	-0.06
	-0.055	*-4.425*	*-0.056*	*-5.137*	*-0.055*	*-0.056*
GDP	-2.31***	-49.533	-2.29***	-44.232	-2.273***	0.516
	-0.515	*-41.589*	*-0.527*	*-48.667*	*-0.518*	*-0.530*
REDEMPTIONS OUT.	-0.001**	-0.037	-0.001**	-0.124***	0	0
	-0.001	*-0.045*	*0.000*	*-0.027*	*0.000*	*0.000*
Adj. R-squared	0.678	0.679	0.674	0.575	0.674	0.261
F-statistic	82.428	82.885	79.892	52.738	80.678	14.581
AIC	-3.219	5.565	-3.209	5.842	-3.212	-3.166
SIC	-3.096	5.688	-3.085	5.966	-3.089	-3.043
WALD TEST:						
TR	472.9239	0.155648	460.8364	0.016867	479.2495	1.208925
	0	*0.6933*	*0*	*0.8967*	*0*	*0.272*
VOLUME	0.015436	650.981	0.003842	318.6996	0.636868	123.1406
	0.9012	*0*	*0.9506*	*0*	*0.4251*	*0*

Exhibit 8: Total return and inflows and outflows.

	TR	IN	OUT	TR	IN (NAV)	OUT (NAV)	TR	IN (%)	OUT(%)
TR(-1)	0.206***	8.214**	-14.97***	0.203***	14.107*	-0.596	0.219***	0.112***	-0.033
	4.351	*1.974*	*-2.760*	*4.299*	*1.913*	*-0.143*	*4.653*	*3.316*	*-1.059*
TR(-2)	0.056	-0.982	4.075	0.063	-14.527	-5.638	0.048	0.023	0.036
	0.939	*-0.189*	*0.603*	*1.068*	*-1.578*	*-1.080*	*0.828*	*0.543*	*0.930*
TR(-3)	0.511***	13.794***	-3.45	0.495***	15.773*	-5.046	0.497***	-0.012	-0.066
	8.521	*2.625*	*-0.504*	*8.332*	*1.697*	*-0.957*	*8.230*	*-0.274*	*-1.651*
TR(-4)	0.397***	-14.749**	1.564	0.401***	-1.539	7.648	0.412***	-0.056	0.069
	5.860	*-2.484*	*0.202*	*6.001*	*-0.147*	*1.289*	*6.117*	*-1.156*	*1.538*
IN(-1)	0.001	0.523***	-0.083	0	0.156***	-0.016	0.088	0.321***	-0.046
	1.465	*13.419*	*-1.634*	*0.997*	*5.430*	*-1.009*	*1.500*	*7.645*	*-1.188*
IN(-2)	-0.0001	0.117***	0.105*	0	0.035	0.021	-0.001	0.069*	0.019
	-0.244	*2.705*	*1.862*	*0.598*	*1.333*	*1.401*	*-0.025*	*1.957*	*0.581*
IN(-3)	0.0002	0.061	0.088	0	0.083***	-0.022	-0.016	0.163***	0.017
	0.365	*1.462*	*1.623*	*0.513*	*3.419*	*-1.600*	*-0.419*	*5.960*	*0.667*
IN(-4)	-0.001**	0.054	0.073	0**	-0.001	0.016	-0.038	-0.05***	0.01
	-2.385	*1.475*	*1.541*	*-2.089*	*-0.061*	*1.612*	*-1.662*	*-3.020*	*0.640*
LOG_OUT(-1)	0	0.028	0.128***	0	0.273***	0.443***	0.027	0.013	0.217***
	0.376	*1.674*	*5.783*	*-1.054*	*3.890*	*11.110*	*0.453*	*0.320*	*5.581*
LOG_OUT(-2)	0*	0.006	0.083***	0.001**	-0.085	0.014	0.036	0.052	0.05
	1.728	*0.339*	*3.645*	*2.278*	*-1.062*	*0.304*	*0.616*	*1.252*	*1.292*
LOG_OUT(-3)	0.0001	0.02	0.0628***	-0.0001	0.0655	0.1058**	0.0131	0.008	0.0552
	0.255	*1.099*	*2.652*	*-0.162*	*0.809*	*2.306*	*0.196*	*0.166*	*1.245*
LOG_OUT(-4)	0	0.022	0.06***	0	0.072	0.176***	0.008	0.029	0.082*
	0.016	*1.232*	*2.551*	*-0.383*	*0.972*	*4.198*	*0.125*	*0.615*	*1.904*
C	0.115***	0.195	-3.045	0.118***	-6.889	0.199	0.098**	-0.055*	-0.029
	2.720	*0.052*	*-0.628*	*2.736*	*-1.020*	*0.052*	*2.382*	*-1.847*	*-1.059*
LOG_ASSET	-0.004**	0.048	0.212	-0.004**	0.353	0.069	-0.003*	0.002*	0.001
	-2.097	*0.269*	*0.906*	*-2.080*	*1.082*	*0.373*	*-1.772*	*1.704*	*0.962*
TURNOVER (-1)	0.02	-4.171**	-3.11	0.019	3.447	-2.011	0.022	-0.021	0.003
	0.995	*-2.347*	*-1.343*	*0.925*	*1.064*	*-1.095*	*0.935*	*-1.270*	*0.176*
LEVERAGE (-1)	-0.048***	0.784	-3.35***	-0.048***	0.389	-2.227***	-0.047***	0.015***	-0.007*
	-8.113	*1.509*	*-4.948*	*-8.037*	*0.414*	*-4.176*	*-7.938*	*3.493*	*-1.688*
CASH (-1)	0.063**	5.357**	17.56***	0.054*	10.417**	7.673***	0.069**	0.025	0.117***
	2.050	*1.978*	*4.976*	*1.723*	*2.107*	*2.738*	*2.318*	*1.140*	*5.859*
ASSET CONCENTR	-0.003	-0.413	-3.583***	-0.001	-2.392	-2.722***	-0.001	-0.004	-0.003
	-0.282	*-0.403*	*-2.684*	*-0.066*	*-1.316*	*-2.641*	*-0.051*	*-0.548*	*-0.381*
VINTAGE_QUARTI	0	0.009**	0.002	0	0.001	0.005	0	0	0
	0.647	*2.274*	*0.333*	*0.213*	*0.099*	*1.248*	*0.339*	*0.348*	*1.083*
EQUITY	0.335***	4.338	-0.431	0.337***	-7.897	1.422	0.324***	-0.06	-0.005
	6.087	*0.900*	*-0.069*	*6.048*	*-0.904*	*0.287*	*5.871*	*-1.516*	*-0.136*
GDP	-2.226***	-34.666	45.88	-2.359***	56.763	22.755	-2.275***	0.362	0.21
	-4.240	*-0.754*	*0.765*	*-4.493*	*0.691*	*0.488*	*-4.386*	*0.973*	*0.610*
REDEMPTION OU	-0.001*	0.078	-0.112*	-0.001**	-0.014	-0.11***	-0.019	0.003	0.063***
	-1.879	*1.581*	*-1.741*	*-2.121*	*-0.320*	*-4.264*	*-0.705*	*0.171*	*3.502*
Adj. R-squared	0.678	0.265	0.436	0.676	0.586	0.599	0.675	0.297	0.207
F-statistic	66.334	48.338	25.001	65.584	44.754	47.101	66.090	14.206	9.150
AIC	-3.211	5.735	6.264	-3.211	32.258	5.769	-3.205	-3.868	-4.022
SIC	-3.060	5.886	6.415	-3.059	32.409	5.921	-3.055	-3.718	-3.872
Wald test									
TR	479.9444	3.991637	0.403304	433.4486	2.127326	1.443836	433.5399	2.984688	0.083938
	0	*0.0462*	*0.5254*	*0*	*0.1452*	*0.23*	*0*	*0.0845*	*0.7721*
IN	0.010141	55.58968	2.604927	0.579981	413.4633	2.395734	0.299253	141.4261	0.003527
	0.9198	*0*	*0.107*	*0.4466*	*0*	*0.1222*	*0.5845*	*0*	*0.9527*
OUT	5.578526	12.9822	152.5259	1.51019	19.12744	355.8796	0.922773	2.554122	54.43815
	0.0185	*0.0003*	*0*	*0.2196*	*0*	*0*	*0.3371*	*0.1105*	*0*

Exhibit 9: Total return and Net flows.

	TR	NET	TR	NET (NAV)	TR	NET (%)
TR(-1)	0.202***	9.342	0.206***	8.57	0.219***	0.158***
	4.307	*1.125*	*4.404*	*0.989*	*4.680*	*3.417*
TR(-2)	0.056	2.634	0.058	9.517	0.0420	-0.0190
	0.964	*0.254*	*0.996*	*0.876*	*0.727*	*-0.330*
TR(-3)	0.516***	14.567	0.511***	15.265	0.505***	0.040
	8.714	*1.385*	*8.610*	*1.389*	*8.496*	*0.688*
TR(-4)	0.417***	-14.077	0.415***	-18.13	0.407***	-0.1070
	6.267	*-1.192*	*6.249*	*-1.473*	*6.113*	*-1.620*
NET(-1)	0	0.414***	0	0.428***	0.0360	0.305***
	1.580	*10.245*	*1.444*	*10.616*	*0.854*	*7.262*
NET(-2)	0	-0.034	0	-0.028	-0.0120	0.0240
	-1.488	*-0.763*	*-1.638*	*-0.625*	*-0.310*	*0.641*
NET(-3)	0	0.098**	0	0.073	0.0080	0.139***
	-0.313	*2.159*	*-0.093*	*1.623*	*0.265*	*4.538*
NET(-4)	0**	0.104**	0*	0.118***	-0.055**	-0.046*
	-1.990	*2.362*	*-1.767*	*2.708*	*-2.099*	*-1.790*
C	0.092**	-1.529	0.097**	-1.509	0.098**	-0.0340
	2.193	*-0.204*	*2.320*	*-0.195*	*2.411*	*-0.843*
LOG_ASSET	-0.003	-0.01	-0.003	0.011	-0.003*	0.0020
	-1.536	*-0.029*	*-1.651*	*0.029*	*-1.769*	*0.799*
TURNOLAG	0.027	2.493	0.026	1.441	0.030	-0.0140
	1.361	*0.695*	*1.302*	*0.388*	*1.308*	*-0.641*
LEVERAGE	-0.049***	3.454***	-0.049***	3.508***	-0.048***	0.022***
	-8.400	*3.332*	*-8.435*	*3.243*	*-8.288*	*3.830*
CASH	0.079***	-1.647	0.074***	-1.421	0.077***	-0.068**
	2.731	*-0.320*	*2.560*	*-0.264*	*2.655*	*-2.363*
ASSET_CONCSU_VALUE	-0.006	2.252	-0.005	2.102	-0.0030	-0.0040
	-0.499	*1.136*	*-0.491*	*1.014*	*-0.244*	*-0.405*
VINTAGE_QUARTER	0	0.001	0	-0.001	00	00
	0.386	*0.115*	*0.560*	*-0.150*	*0.228*	*-0.541*
EQUITY	0.335***	5.791	0.334***	4.713	0.326***	-0.0680
	6.175	*0.602*	*6.164*	*0.469*	*5.929*	*-1.257*
GDP	-2.201***	-1.805	-2.209***	-10.913	-2.217***	0.2670
	-4.294	*-0.020*	*-4.305*	*-0.115*	*-4.294*	*0.524*
LOG_RED	-0.001	0.199**	-0.001*	0.09*	-0.017	-0.051*
	-1.652	*1.996*	*-1.827*	*1.693*	*-0.635*	*-1.947*
Adj. R-squared	0.681	0.295	0.681	0.305	0.677	0.241
F-statistic	83.609	17.209	83.330	17.993	81.952	13.246
AIC	-3.229	7.129	-3.227	7.218	-3.215	-3.240
SIC	-3.106	7.251	-3.104	7.341	-3.092	-3.117
WALD TEST						
TR	455.418	1.865	447.716	2.471	440.051	2.833
	0.000	*0.173*	*0.000*	*0.117*	*0.000*	*0.093*
NET	3.639	117.429	3.153	122.851	0.211	84.109
	0.057	*0.000*	*0.076*	*0.000*	*0.646*	*0.000*

Exhibit 10: The impact of fund types and managerial characteristics.

	TR	NET		TR	NET (NAV)		TR	NET (%)	
SPECIALIZED	-0.005	0.264		-0.004	0.051		-0.002	-0.002	
	-0.966	*0.3*		*-0.753*	*0.055*		*-0.446*	*-0.471*	
VALUE ADDED	-0.012	1.327		-0.011	1.079		-0.012	0.015	
	-1.318	*0.806*		*-1.225*	*0.626*		*-1.236*	*1.616*	
OPPORTUNISTIC	-0.041***	2.373**		-0.042***	2.342**		-0.043***	0.016***	
	-6.934	*2.258*		*-6.981*	*2.136*		*-7.095*	*2.68*	
BANK GROUP	-0.006	-0.609		-0.006	-0.666		-0.005	-0.011*	
	-0.976	*-0.598*		*-1.034*	*-0.623*		*-0.861*	*-1.843*	
CREATE OTHER FUND	0.003	0.952		0.002	0.719		0.005	0.002	
	0.407	*0.846*		*0.387*	*0.61*		*0.79*	*0.386*	
COMPANY VALUE (LN)	-0.002	-0.396		-0.003	-0.368		-0.004	0	
	-1.002	*-0.904*		*-1.057*	*-0.803*		*-1.43*	*0.128*	
Adjusted R-squared	-0.002	-0.438		-0.002	-0.458		-0.002	-0.002	

	TR	IN	OUT	TR	IN (NAV)	OUT (NAV)	TR	IN (%)	OUT (%)
SPECIALIZED	0.002	-4.147***	-3.151***	-0.001	-0.646	-0.722	0	-0.003	-0.002
	0.447	*-5.157*	*-5.393*	*-0.174*	*-1.345*	*-1.473*	*0.083*	*-0.734*	*-0.584*
VALUE ADDED	-0.014	1.287	-2.454**	-0.011	0.902	-1.706**	-0.015	0.006	-0.008
	-1.521	*0.891*	*-2.339*	*-1.213*	*1.114*	*-2.063*	*-1.534*	*0.887*	*-1.239*
OPPORTUNISTIC	-0.04***	-0.331	-2.776***	-0.042***	0.299	-1.734***	-0.042***	0.009**	-0.007
	-6.639	*-0.356*	*-4.11*	*-6.906*	*0.572*	*-3.246*	*-6.846*	*2.05*	*-1.614*
BANK GROUP	-0.005	-1.034	-0.5	-0.006	-0.13	0.166	-0.006	-0.006	0.006
	-0.788	*-1.154*	*-0.768*	*-0.983*	*-0.261*	*0.325*	*-0.988*	*-1.486*	*1.447*
CREATE OTHER FUNDS	0.003	0.971	-0.643	0.003	0.484	-0.291	0.004	-0.001	-0.003
	0.505	*0.988*	*-0.901*	*0.465*	*0.876*	*-0.515*	*0.638*	*-0.189*	*-0.81*
COMPANY VALUE (LN)	-0.003	0.058	0.535*	-0.003	-0.149	0.176	-0.004	0.002	0.002
	-1.329	*0.151*	*1.913*	*-1.318*	*-0.693*	*0.8*	*-1.44*	*0.999*	*1.104*
Adjusted R-squared	0.670	0.297	0.447	0.671	0.610	0.601	0.667	0.289	0.191

	TR	VOL		TR	VOL (NAV)		TR	VOL (%)	
SPECIALIZED	-0.002	-1.579***		-0.002	-1.756***		-0.001	-0.005	
	-0.287	*-3.413*		*-0.279*	*-3.388*		*-0.172*	*-0.983*	
VALUE ADDED	-0.013	-0.268		-0.013	-0.126		-0.014	-0.001	
	-1.366	*-0.36*		*-1.357*	*-0.145*		*-1.455*	*-0.09*	
OPPORTUNISTIC	-0.042***	-0.745		-0.043***	-1.167**		-0.042***	0.004	
	-6.935	*-1.55*		*-6.822*	*-2.041*		*-7.091*	*0.66*	
BANK GROUP	-0.005	-0.258		-0.005	0.28		-0.005	-0.001	
	-0.842	*-0.561*		*-0.864*	*0.516*		*-0.903*	*-0.252*	
CREATE OTHER FUNDS	0.004	0.095		0.004	-0.165		0.004	-0.005	
	0.614	*0.186*		*0.567*	*-0.276*		*0.656*	*-0.756*	
COMPANY VALUE (LN)	-0.003	0.143		-0.003	0.19		-0.004	0.004	
	-1.307	*0.72*		*-1.27*	*0.819*		*-1.404*	*1.575*	
Adjusted R-squared	0.668	0.684		0.663	0.567		0.668	0.256	