

Management of the Net Asset Value in the Real Estate Sector: An Empirical Evidence

1. Introduction

The aim of this study is to examine whether fund managers strategically run the net asset value of the real estate investment funds under their management and which factors may influence their decisions. The legal framework of the Portuguese real estate investment funds allows fund managers to show some discretion in valuing properties opening room for empirical study on earnings management for this sector.

According to the Portuguese securities market regulation for real estate investment funds, properties have to be revalued every two years at least¹. In the meantime, in order to determine the value of the property for subscriptions or redemptions, fund managers may choose any value between the acquisition cost and the average of the appraisal values attributed by two independent appraisers². This means that they may choose to keep the asset valued at its historical cost, to keep it at the revaluation value, or at any value between both. One common procedure is to progressively recognise the revaluation increments of properties starting from the acquisition cost up to the revaluation value.

Therefore, we hypothesise that fund managers have the opportunity to control (“manipulate”, or “manage”) the investors’ earnings throughout the timing of the recognition of the unrealized gains that arise from fund assets. In order to test this hypothesis, based on a property-held sample, we first analyze the cross-sectional distribution of a variable named RDIF - Return Rate Difference computed as the difference between the annual asset value increments fixed by fund managers and the annual appraisal changes recommended by appraisers. The observation of unusually high frequencies of negative values of this variable can evidence that fund managers are using their discretion to manipulate earnings. If as we hypothesise, there is evidence of earnings

¹ As per article 29º of Decree-Law nr. 13/2005 dated January, 7th.

² As per article 8º of *CMVM*’s Regulation nr. 8/2002.

management, it will be relevant to examine in what conditions managers work out the earnings and what are the major factors that lead to such a behaviour.

Then, based on a fund-held sample, we test different hypothesis to examine if fund characteristics as fund type, dimension or fund vacancy rates can stimulate earnings management actions. After modelling how annual revaluations increments of funds properties would be reported in the absence of earnings management, we estimate a discretionary accrual proxy as the difference between the reported revaluation increment and its expected value obtained by the model.

A study on earnings management in real estate investment funds can contribute to the existing literature in general and to real estate research in particular for several reasons. As far as we know, this paper is among the first to analyse earnings management in real estate investment funds. This type of vehicle is particularly interesting as we believe that its institutional design and the public information available will allow us to improve the existing literature on earnings management.

Second, this paper provides further evidence on the debate of the use of fair value in accounting records. With the move to international accounting standards, fair values have been increasingly introduced in different industries as a basis for accounting measurements. Real estate is a fundamental sector to examine the benefits and costs of using fair values. However, the literature seems to be split apart between those that support the benefits that such a measure can convey, and those that show their drawbacks. Dietrich, Harris, and Muller (2000) for instance, consider that fair value estimates can be more relevant but less likely to be reliable. This debate is even more important if we consider that the financial crisis which we are going through has its origin in the bursting of United States housing bubble, with an overvaluation of real estate prices.

Finally, this research can also supply relevant evidence to the question of transparency of non-listed real estate vehicles in comparison with the public real estate sector. With the

recent launching of vehicles in the UK and Germany with a legal and financial structure very similar to US REITs (Real Estate Investment Trusts), the study of real estate investment alternatives, its differences, similarities, performance and drawbacks seems to be a subject with growing importance in Europe.

The remainder of the article is organized as follows: the next section provides a background about the Portuguese real estate sector and discusses the related literature. The testable hypotheses are discussed in section 3. In section 4, we present the research design employed to test the hypothesis. Section 5 describes the sample and provides descriptive statistics and section 6 discusses the empirical results. Conclusions are presented in the last section.

2. Management of Net Asset Value in Real Estate

2.1. Background and Context

Traditionally, investors have two alternative ways to invest in real estate: either, directly on the private real estate sector through the acquisition of properties or, indirectly, through the public real estate market, purchasing shares of real estate companies.

According to Brounen, Veld, and Raitio (2007), there is a third alternative of real estate investment that lies in between the spectrum of publicly listed real estate shares and the private real estate market: the non-listed real estate investment funds. Despite the vast literature on the characteristics of public and private real estate vehicles and in its benefits for a mixed asset portfolio, less research has been done on the features of non-listed vehicles. However, their performance, as well as their low volatility and contribution to the portfolio diversification make them an interesting instrument for institutional and private investors around the world. Furthermore, with the recent launching of vehicles in the UK and Germany with a legal and financial structure very similar to US REIT's (Real Estate Investment Trust), the study of real estate investment alternatives, its differences, similarities, performance and drawbacks seems to be a subject with growing importance in Europe.

Despite being able to avoid the influence of the overall stock market, real estate investment funds present some drawbacks, namely regarding liquidity, valuation measures and information transparency. In this context, further research on regulation, corporate governance and market information can contribute positively to the real estate literature.

In Portugal, the indirect investment in real estate is achieved predominantly through non-listed real estate vehicles (Real Estate Investment Funds), as the market of listed real estate companies has no expression. This, together with the characteristics of Portuguese real estate investment funds, their evolution in the last decade, and the information publicly available increases the interest of the study of the Portuguese market for research purposes.

Real estate investment funds were first introduced in Portugal in 1987 in order to offer an alternative product to the traditional forms of savings. This kind of investment is generally perceived by investors as a financial product that provides a stable cash flow for long periods, with capital growth potential at a low risk. By the end of 2008, there were 231 funds with a reported GAV – Gross Asset Value of € 10.6 billion³. This market includes 138 closed-end real estate investment funds with a GAV of € 5.2 billion, 14 open-end real estate investment funds with a GAV of € 4,0 billion, the remaining being managed by 79 special real estate investment funds. The investment is predominantly domestic (national) in properties such as offices and retail properties. The investment in the residential market represented less than 11% of the GAV by the end of 2008.

By law, real estate investment funds should be managed by a fund management company, which is set up in the legal form of limited liability company (“*sociedade anónima*”) with the special purpose of managing investment fund’s assets⁴. In many

³ By the end of 2008, the INREV (European Association for Investors in Non-listed Real Estate Vehicles) database included 484 vehicles with a reported gross asset value of €287 billion.

⁴ By the end of 2008, there were thirty two fund management companies in Portugal.

cases, the shareholders of these companies are commercial banks which then use their retailing branch networking as a delivery channel for the investment funds that they manage. Therefore, they are not common agents or investors as all the remaining investors that hold fund investment units.

Under the Portuguese Law⁵, the investment funds should have their property assets valued by two independent appraisers before any acquisition, disposal or with a minimum periodicity of two years. These appraisal values constitute a benchmark for fund managers as they periodically fix the value of the property in the interval between the acquisition cost and the average of the appraisal values attributed by the two appraisers⁶. Considering this last feature, we consider that fund managers can have some opportunity of manipulating earnings throughout the time of unrealized gains recognition which together with the reliability of appraisal values of properties and independence of appraisers could lead to question of transparency of these vehicles.

2.2. Prior Research on Earnings Management

It is possible to find several definitions for “Earnings Management” in the literature. Some authors consider that earnings management is the manipulation of accounting information in order to achieve a specific goal for their own benefit (Schipper (1989), Healy and Wahlen (1999) and Leuz, Nanda, and Wysocki (2003)). In this context, earnings management can imply misinforming stakeholders about the true economic activity of the company, resulting in managerial opportunism. Within GAAP framework, managers have the opportunity to influence accounting information through the choice of accounting methods or estimates, with private gains, at the expense of some other party or parties. If information manipulation becomes excessive and aggressive, earnings management can lead to adverse consequences to the market and in an extreme case be considered as fraud. Healy and Wahlen (1999) consider that “earnings management occurs when managers use judgement in financial reporting and in structuring

⁵ As per article 29^o of Decree-Law nr. 13/2005 dated January, 7th.

⁶ As per article 8^o of CMVM's Regulation nr. 8/2002.

transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers.” This definition presupposes that managers have access to information that is not available to market participants and that it is possible to mislead them with such information.

As we intend to analyse if real estate fund managers manipulate investor’s earnings through the timing of the recognition of the unrealized gains that arise from fund assets, our work will be in line with Healy and Wahlen (1999) definition, seeking to examine which are the major factors that lead to such behaviour.

A strand of the literature analyses whether there is evidence of earnings management in order to meet important thresholds or investors expectations. Degeorge, Patel, and Zeckhauser (1999) find clear support for earnings management sustained by three thresholds: report positive profits, sustain recent performance and meet analyst’s expectation. Burgstahler and Eames (2006) and Abarbanell and Lehavy (2003) reinforce this finding with evidence of earnings management in order to meet analyst forecasts. Burgstahler and Dichev (1997) provide evidence that firms manage reported earnings to avoid earnings decrease and losses. Other example is the work of Naveen, Denis, and Naveen (2008) that shows evidence of earnings management to meet expected dividend levels.

Finally, a set of related studies explores regulatory motivations usually based on industry-specific regulation. An important part of this research has been analysing managerial discretion associated with capital regulation in the banking industry, concluding that there is earnings manipulation in order to avoid regulatory intervention (see for example Moyer (1990) , Nissim (2003) and Beaver, McNichols, and Nelson (2003)).

Besides being framed within an industry specific regulation, we believe that our work will be in line with studies that analyse whether there is evidence of earnings

management in order to meet important thresholds or investors expectations as we hypothesise that this can be a motivation for fund manager's manipulation.

Despite the vast literature on earnings management, recent review of literature⁷ conclude that results are controversial principally due to some limitation of research design and consequently to difficulties in interpretation of the evidence.

2.3. Earnings Management in Real Estate Sector

With the move to international accounting standards (IAS), the debate about the use of fair value⁸ measures seems to increase the attention from academics, practitioners and regulators. However, it seems that the use of fair value measures is a controversial question. While some authors consider that market value can lead to more manipulation and that the benefits of conservatism and transaction-based accounting should not be dismissed (Watts (2003)), others believe that fair values can make financial information more useful to investors in making economic decisions (Barth (2006) and Barth, Beaver, and Landsman (2001)). The use of fair values can therefore be more relevant to financial users but questions of reliability or earnings management may arise. This is particularly relevant in the real estate sector, where fair value measurement can be applied for a great majority of the assets and therefore are more open to manipulation.

In this context, Dietrich, Harris, and Muller (2000) investigated the reliability of annual fair value estimates for UK investment property. Using a sample of all firms in the UK property industry between the years 1988 and 1996, the authors investigate the accuracy of fair value estimates for these companies. They conclude that fair value estimates are

⁷ Fields, Lys, and Vincent (2001); Dechow and Skinner (2000) Healy and Wahlen (1999), McNichols (2000) and Aljifri (2007)

⁸ Despite some authors arguing that because of some buyers and sellers behavior, fair value can be different from market value, we consider in this work that they are similar concept. We adopt the definition of market value of IVSC (International Valuation Standards Committee) 2007 : market value is "the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction after proper marketing wherein the parties had acted knowledgeably, prudently and without compulsion".

typically conservative values of actual sales price and that they represent less biased and more accurate measures of sales price in comparison with historical cost. On the other hand, the authors also investigate if the use of fair value estimates leads to an increase of any type of managerial manipulation⁹. The study reports some managerial manipulation over fair value, showing that managers select among permissible accounting methods to report higher earnings, time asset sales to smooth reported earnings changes and smooth reported net asset changes.

Danbolt and Rees (2008) also conduct an empirical study on relevance, bias and reliability of fair value estimates for UK investment vehicles. Based on a sample of real estate and investment fund companies, the results are consistent with the management of fair values to avoid losses and/or declining asset values, especially for real estate companies where fair value estimates are more ambiguous.

Considering that our work intends to investigate the existence of earnings management in the real estate sector, we are in line with this literature. Nevertheless, our approach differs from previous studies in that we are studying earnings management for non-listed real estate investment funds which are especially open to managerial manipulation due to their especial design and characteristics. On the other hand, if as we hypothesise, there is evidence of earnings management from real estate investment fund managers, we will seek to investigate what can motivate such behaviour. In a first stage, we will focus only on the possibility of earnings manipulation throughout the recognition of the unrealized gains that arise from funds assets evaluation, assuming therefore that valuation is conducted by an independent appraiser, and that fund managers will not influence appraisers to manipulate fair value estimates. Therefore, we will focus on the discretion that fund managers can have on property value increment. The eventual influence that fund managers can have on appraisers to manipulate fair value estimates will be the subject of a further research.

⁹ Discretion may be reflected in the selection among permissible accounting alternatives, in the selection of properties to be sold and/or in the influence on appraisers to manipulate market value estimates.

3. Hypothesis Development

In this section, we present the testable hypothesis. According to previous literature, we start by assuming that fund managers strategically manage the net asset value of the real estate fund under their management in order to achieve earnings thresholds. The literature evidence that earnings are critical in financial reports for analysts, investors or managers (Dechow, Richardson, and Tuna (2000) and Sok-Hyon Kang and Sivaramakrishnan (1995)).

It seems that there are strong incentives to avoid reporting decreases (Barth, Elliott, and Finn (1999), Beatty, Bin Ke, and Petroni (2002) and Myers, Myers, and Skinner (2006)) and to manipulate earnings in order to exceed thresholds (Burgstahler and Dichev (1997), DeGeorge, Patel, and Zeckhauser (1999) and Naveen, Denis, and Naveen (2008)).

In the real estate sector, returns result mainly from rents collected from properties, as well as from the appreciation of these assets. As referred in Dietrich, Harris, and Muller (2000), changes in net asset values for investment property companies are similar to earnings for other companies. Therefore, managers of these companies face the same incentives to managing changes in reported net asset value as managers of other firms face with earnings. In Portuguese real estate investment funds, as managers have some discretion in the determination of property values, introducing some subjectivity with regard to reported values, we consider that the annual revaluation of properties may constitute an important accrual and then may be used to test the hypothesis of managerial manipulation in real estate sector.

Following previous literature, we start by identifying incentives that can drive earnings management. Beneish (1997) conclude that firms that beat benchmarks present high accruals and unusual levels of special items relative to other firms, being the delay of bad news reporting a strong incentive to earnings management.

Analyst earnings forecasts seem to incentive managers to engage in earnings management in order to avoid negative earnings surprise (Degeorge, Patel, and Zeckhauser (1999), Matsumoto (2002), and Burgstahler and Eames (2006)).

In our work, we suggest to use appraisal values attributed by the independent appraisers as a benchmark that influences the behaviour of fund managers. According to the securities market regulation, properties' value should be in between its historical cost and the average of two appraisal values attributed by two independent appraisers every two years minimum. Consequently, we consider that appraised estimates of property value and its changes constitute an important reference for managers in the determination of assets value.

Therefore, we can interpret valuations changes as an analyst earnings forecast for other industries. Assuming that market value estimates are reliable¹⁰, we compute the returns implicit in these estimates and consider that they represent a forecast that manager will take as a benchmark in the determination of property values. Obviously, considering that market values are not obtained in a competitive market, the expertise and appraiser judgement is a fundamental key for value determination. Then, these values are subjective and therefore can lead to manipulation and errors. Nevertheless, in this first work, we are not going to examine the influence that managers can eventually exert on appraisers to manipulate market value estimates. We choose to focus on how managers can use their discretion to manage earnings assuming that appraisals estimates are exogenous to our analysis and therefore will not be influenced by fund managers.

The above discussion leads us to state the following hypothesis:

H1: Fund managers use their allowed flexibility to manage investors' earnings through the timing of the recognition of the asset value revaluations (unrealized gains) that arise from funds assets.

¹⁰ As in Danbolt and Rees (2008) we define reliability as the precision of market value estimates.

In open-end real estate investment funds, investors can either purchase units that are issued on demand or redeem them at the net asset value offering greater liquidity insurance but with higher liquidity risk. According to Focke (2006) the long maturity and low liquidity of fund assets together with the possibility of the return of units at any time lead to the danger of a “bank run” with disastrous effects on the fund. Therefore, this type of real estate fund is submitted to more strict regulation regarding information disclosure and portfolio composition. Sebastian and Tyrell (2006) model concludes that the open-end structure provides a monitoring function which serves as an efficient instrument to discipline the funds management.

Nevertheless, the possibility of issue and redeem units in a daily basis could also cause pressure on fund managers to manipulate or influence properties valuation as discussed in the empirical work of Duque and Barros (2002). In a study for the Portuguese real estate investment funds markets, the authors conclude that the property valuation system for close-ended real estate investment funds is more consentaneous with market price reality than open-end real estate investment funds. The higher return volatility founded in close-ended funds in contrast to a high stability of open-end funds leads the authors to question the criteria of property valuation for this type of fund.

In this work, we consider that the more strict regulation regarding information disclosure and portfolio composition can disincentive earnings management behavior and therefore state the following hypothesis:

H2: Earnings management in open-end real estate investment funds is weaker than in close-ended funds.

Portuguese real estate investment funds invest predominantly in lease market. More than 55% of total properties are presently leased (*Confidencial imobiliária*, 2008). Therefore, rents collected represent a large part of funds’ returns. As we consider that this measure is largely nondiscretionary, we predict that funds manager can use asset value revaluations to compensate an increase in vacancy rates.

Therefore, we also predict that:

H3: Real estate investment funds which present higher vacancy rates are more likely to register earnings management actions.

There is a vast empirical literature that investigates the relation between audit firms quality¹¹ and earnings management. Becker, M. Defond, and K.R Subramanyam (1998) conclude that clients of non-Big Six audit firms report discretionary accruals that increase income relatively more than the discretionary accruals reported by clients of Big Six auditors. Krishman (2003) presents the same conclusion for clients of non-specialists auditors vs specialists auditors. In Korea, Kim and Hi find that the level of discretionary of accruals is significantly lower for firms with designated auditors than firms with a free selection of auditors. Therefore, we also predict that auditor's quality can influence the level of earnings management in the real estate sector with the following hypothesis:

H4: we predict that real estate investment funds that are audit by international auditing firms present a lower level of earnings management.

Finally, it should be referred that we can distinguish between fund management companies that are integrated in a financial group and those that can be defined as independent of this type of ownership. As mentioned in Bannier, Fecht, and Tyrell (2007) banks do not only own investment management companies managing different type of funds and holding a variety of business relations that may conflict with investor's interests. Ferris and Yan (2009) evidence that the type of fund management company can influence the agency conflicts involved in the process. Alves (2005) also suggests that the attitude of the financial group in which the mutual fund is integrated can be different from the fund participant interests leading to agency costs. The author refers that if the collective investment instrument is managed by a financial group which keeps

¹¹ DeAngelo 1981 presents theoretical support for a quality differentiation between Big Six auditors and non—Big Six auditors

commercial relations with participated firms, the financial group can have an attitude contrary to the interests of fund participants. Therefore, we state a last hypothesis:

H5: We predict that real estate investment funds integrated in a financial group will present a higher level of earnings management from those that can be defined as independent of this type of ownership.

4. Research Design

Property-held sample

In order to test the first hypothesis, we follow a research design similar to Burgstahler and Dichev (1997) and Degeorge et al. (1999) based on the analysis and comparison of the distributions of asset values changes fixed by fund managers from those fixed by appraisers.

Previous literature presents evidence that analyst earnings forecasts represent a threshold that helps driving earnings management (Degeorge et al. (1999), Brown (2001), Matsumoto (2002) and Burgstahler and Eames (2006)). For our sector, we hypothesis that the appraisal estimates made by the two independent appraisers will stand for a benchmark for REIFs fund managers as analysts forecasts are a reference for the management of other type of structures. Our first hypothesis predicts that fund managers will be driven to meeting or beating appraiser's estimates to avoid negative surprises. As referred in Degeorge *et al.* (1999) earnings management to reach thresholds affects the distribution of reported earning, being expected to observe a discontinuity near the threshold. As changes in asset values for investment property companies can be compared to earnings for other companies (Dietrich *et al.* (2000)), we contrast the behavior of fund managers with appraisers to test our first hypothesis.

Therefore, we compute a variable named RDIF – Return Rate Difference in order to compare the annual asset value increments fixed by fund managers with the annual appraisal changes recommended by appraisers. We calculate RDIF for each property as

the difference of the annual return implicit in two sequential appraisals¹² (RIMP) at the beginning of the year and the annual asset value change (unrealized gain) fixed by fund manager for year t .

$$RDIF_{it} = RIMP_{it} - RA_{it}$$

where subscript i indicates property i and t indicates year t .

$$RIMP_{it} = \ln\left(\frac{AV_{it+n}}{AV_{it}}\right) * \frac{365}{N}$$

where AV_{t+n} represents the average of the appraisals make by the two independent appraisers for property i in $t+n$

and,

$$RA_{it} = \ln\left(\frac{PV_{it+1}}{PV_{it}}\right)$$

where PV_{it+1} represents the value of property i fixed by fund managers in year $t+1$.

If the value of RDIF is negative, then we can conclude that the asset value increment fixed by fund managers is higher than the return estimated by appraisers. The bigger the value of RDIF, the higher will be the divergence between fund managers and appraisers about property valuation.

Negative values of RDIF represent situations in which fund managers are less conservative in unrealized gain recognition than appraisers' recommendation. Therefore, if earnings management hypothesis hold, we expect to observe a high frequency of

¹² RIMP_i is therefore the proxy for appraiser's forecasts.

negative RDIF. Consequently, in the first part of our work, we will examine the cross-sectional distribution of RDIF properties value changes.

Fund-held sample

In this second phase of our work, we attempt to find possible determinants of the propensity to earnings manipulation. With this aim in view, we will use a research design similar to McNicholset al. (1988) associated with discretionary accruals. As fund managers has some discretion over asset value changes of fund assets (unrealized gains recognition), we will use this variable as a proxy for management's discretion and attempt to separate this variable in its discretionary and non-discretionary components.

Proxy for Discretionary Asset Value Changes

A first feasible approach is to use a market-wide capital growth in investment property values as an estimate of the “non-discretionary” revaluation as in Dietrichet al. (2000). Nevertheless, following Petrovits (2006), we believe that a more developed model can be estimated in order to estimate discretionary asset value changes. Based on a fund-held sample, we compute an estimate of unmanaged asset value changes by regressing observed values of this proxy on a vector of variables that are hypothesized to influence the non-discretionary component. Therefore, the discretionary component of asset value changes or unexpected asset value changes will be equal to the residual of this regression, i.e., the difference of observed value and the estimated nondiscretionary asset value changes and reflects the amount of additional fund manager's adjustments to property asset value changes based on discretionary motives.

Several authors¹³ point out some limitations to this approach considering that there is no evidence on which factors lead to earnings management, being difficult to understand the relation that exists between discretionary and non-discretionary component. Therefore, most of the models assume that discretionary accruals are orthogonal to non-discretionary accruals.

¹³ See for example McNichols (2000), Thomas and Zhang (2000) and Kothariet al. (2005)

An alternative way followed by Petroni *et al.* (2000) is to directly model the discretionary based on managements incentives to exercise discretion. Nevertheless, as we do not have sufficient information in the literature regarding the motives that lead to earnings management, we will not follow this approach.

As referred in McNichols (2000), considering that in our study we are working in a specific sector and as our variable reflect the exercise of discretion, we consider that we are able to better identify the discretionary components of a given measure than in studies of total accruals.

Therefore, we first define the variables that could influence asset value changes fixed by fund managers in the absence of earnings management.

The following equation explains the change of net asset value of a real estate investment fund:

$$NAV_t = NAV_{t-1} + AVC_t + RC_t - OTHERS_t - RDIST_t + /- CFLOW_t$$

Where NAV_t is the fund net asset value in period t , AVC_t is the asset value change in year t (unrealized gain), RC_t is the total amount of rents collected in year t , $Others_t$ is the sum of administrative costs net of other returns in year t , $Rdist_t$ are dividends distributed in year t and $CFlow_t$ are the net cash flow received from subscriptions and/or paid from redemptions which occur in year t for open-end real estate funds and capital increase or decrease for closed-end real estate funds.

Then, expected annual asset value change (AVC_t) can be modeled as a function of the variables presented in the above equation, as well as by other economic variables that previous literature has found as determinant of direct real estate returns:

$$AVC_{i,t} = \alpha + \beta_1 NAV_{i,t-1} + \beta_2 RC_{i,t} + \beta_3 Others_{i,t} + \beta_4 Rdist_{i,t} + \beta_5 CFlow_{i,t} \\ + \beta_6 GDP_{i,t} + \beta_7 Irate_{i,t} + \beta_8 TReturn_{i,t} + u_{it}$$

where $u_{i,t} = \mu_i + v_{i,t}$

GDP_t is the gross domestic product in year t , IR_t is the interest rate in year t and $TReturn_{i,t}$ is the annual total return for fund i in year t ¹⁴, μ_i is the unobservable individual specific effect and $v_{i,t}$ the remainder disturbance.

In previous literature, the model to estimate non-discretionary accruals is usually estimated cross-sectionally each year by industry. Nevertheless, considering the benefits of panel data econometric analysis, we choose to estimate our model through an unbalanced panel data regression where i denotes the real estate mutual fund and t the time-series dimension. Hsiao, C (2003) and Baltagi, Badi (2008) refer that panel data give more informative data, control for individual heterogeneity and are better able to identify and measure effects.

Our model use data of real estate investment funds where $AVC_{i,t}$ measure the asset value changes fixed by managers in year t and the independent variables represents measures that influence the non-discretionary component of $AVC_{i,t}$. The unobservable fund-specific effects will be captured by the μ_i . Our sample includes information about one hundred and thirty five real estate investment funds for the years 2003-2008.

In panel data analysis, we can distinguish between the (1) fixed effects model and the (2) random effects model. In fixed effect effects model arbitrary correlation between μ_i and independent variables are allowed. In random effects models, μ_i is assumed random, and the independent variables $X_{i,t}$ are assumed to be independent of μ_i and $v_{i,t}$. In our work,

¹⁴ Total return is calculated according to INREV (European Association for investors in non-listed real estate funds) formula $TReturn_{i,t} = \frac{(NAV_{i,t} + XD_{i,t} - CI_{i,t} + RD_{i,t}) - NAV_{i,t-1}}{NAV_{i,t-1}}$, where NAV is net asset value, XD is distributed dividends, CI increases in capital ad RD redemptions (see Fuerst Franz and Matysiak (2009))

considering that we focus on a set of N real estate investment funds and assuming that some unobservable fund-specific effects as managerial skills of the fund managers or the type of fund, included in μ_i , can be related with the set of explanatory variables defined, we expect to apply the fixed effect model.

Explanatory Variables

Earlier empirical research on the returns from direct investments in real estate have found that economic growth (usually measured by the gross domestic product – GDP) positively influence real estate prices, while vacancy rate is inversely related with real estate returns (Ling and Naranjo (1997) and Wit and Dijk (2003)). Regarding interest rates, although the results evidence that interest rate have an impact on real estate performance (Ling and Naranjo (1997), Eichholtz and Huisman (1999) and Watuwa (2008)), some authors conclude that there is no significant influence and that further research is needed with regard to this factor (Giussaniet al. (1993) and Focke (2006)).

We introduce the variable $TReturn_{i,t}$ in the model as Kothariet al. (2005) conclude that under most circumstances, performance-matched discretionary accrual models are well specified and powerful.

The discretionary asset value change ($DAVC_{i,t}$) will be obtained as the difference of observed revaluation increment and its expected value obtained from the model. As in Thomas and Zhang (2000), our work considers that the estimation and forecast periods are similar and therefore we are predicting unexpected or abnormal asset value changes.

In our work, we considered signed fund-years DAVC as we believe that the directional prediction can be important for our conclusions¹⁵. As in Matsumoto (2002), we classify fund-years with positive DAVC as having earnings management upward and those with negative DAVC as having downward earnings management.

¹⁵ According to Hribar and Nichols (2007) testing earnings management using signed discretionary accruals leads to more conservative tests.

To test the different hypothesis presented above, we use the following model:

$$DAVC_{i,t} = \alpha + \beta_1 VacancyRate_{i,t} + \beta_2 PotentialGain_{i,t} + \beta_3 FundType_{i,t} + \beta_4 Daudit_{i,t} + \beta_5 DFinance_{i,t} + \beta_6 Age_{i,t} + \beta_7 Assets_{i,t} + \varepsilon$$

The dependent variable $DAVC_{i,t}$ is the signed value of the abnormal asset value change estimated in the previous equation. We also separate $DAVC_{i,t}$ into strictly positive values ($DAVCPOS_{i,t}$) and strictly negative ($DAVCNEG_{i,t}$). The different explanatory variables are specific to real estate funds and attempt to determine the different factors that can influence the discretionary behaviour of fund managers. $VacancyRate_{i,t}$ represents the rate of vacancy for fund i in year t. $PotentialGain_{i,t}$ is the difference between the average of the appraisals made by the two independent appraisers and the total asset value fixed by fund managers. This variable corresponds to the unrealized gains that can be recognized in future years. $FundType_{i,t}$ is a dummy variable equal to one if the fund is an open-end real estate investment fund and zero if it is a closed-end real estate investment funds. $Daudit_{i,t}$ is a dummy variable used to indicate if the fund is audited by a Big N audit firm (=1) or by a non-Big N audit firm (=0). $DFinance_{i,t}$ is a dichotomous variable to differentiate funds that are included in a financial group(=1) from funds that which are managed by independent fund management company. The remaining two control variables are included to control for fund age ($Age_{i,t}$) and fund size including the log of total assets ($Assets_{i,t}$)¹⁶.

According to our hypothesis, we expect that the discretionary asset value changes - $DAVC_{i,t}$ will be inversely related with $FundType_{i,t}$ and $Daudit_{i,t}$ and positively related with $VacancyRate_{i,t}$ $DFinance_{i,t}$.

In addition, we also conduct a number of univariate tests to confirm our hypothesis.

¹⁶ See Prawitt et al. (2009)

5. Sample, Data and Variables

Property-held sample

Real estate investment fund data (REIFs) was obtained from Portuguese Securities Market Commission (CMVM – *Comissão do Mercado de Valores Mobiliários*) database. Our initial data set comprises 203 real estate investment funds¹⁷ with partial or complete data between 2002 and 2008 which corresponds to 20,272 properties values. Missing or unsuitable data regarding properties series reduce our sample to 12,471 observations¹⁸. As our tests are based on return measures, a property is selected if at least two calendar year of fair and appraisal values are available. Therefore, the analysis covers the period from 2003 to 2008. As at 2008, several properties have not been appraised yet, and therefore we were unable to compute the return implicit in appraisals for all properties. After controlling for outliers¹⁹, we are left with a final sample of 8,660 property-year observations²⁰ and 150 REIFs as explained in table 2.

Table 1: Sample

	Property-year observations
Initial sample of property-year observations (203 REIFs)	20,272
Missing or unsuitable Observations	7,841
Return data and calculation of 2008 return implicit variable	3,273
Outlier elimination	498
Final Sample(150 REIFs)	8,660

Table 3 presents detailed descriptive statistics for our principal measures. Both the annual return fixed by fund managers (RA) and the annual returns implicit in appraisal estimates

¹⁷ 14 open-end REIFs and 189 closed-end real estate funds.

¹⁸ In many cases, we were unable to get the complete time series for a property as there were significant changes in the name/code of properties.

¹⁹ we remove the top and bottom 1% of each variable.

²⁰ Statistical analysis and econometric estimation was conducted using the software STATA version 10.

(RIMP) present a relatively stable distribution during the sample period, being the sample mean of RA (0.73%) just slightly higher than the sample mean of RIMP (0.70%). Nevertheless, in 2008, we can observe a substantial decrease in both returns, being the sample mean return implicit in appraisal recommendations of only 0.12%, evidencing the ongoing period of turbulence of financial markets. It should be referred that appraisal estimates register a higher variability with an inter-quartile range of 2.67% vs 0.47% for property annual returns, evidencing that appraisers seem to adjust their estimate more frequently than fund managers.

Table 3, Panel C presents descriptive statistics for RDIF which represent the difference between annual return implicit in appraisal estimates (RIMP) at the beginning of the year and the annual revaluation fixed by fund managers (RA). The results indicate that in the total sample, RIMP overstated RA in 0.18%, indicating that the annual revaluation of appraisers are superior to the correspondent annual return fixed by fund managers. Nevertheless, there is some cross-sectional variation as RA is overstated 0.96 percent at the 25th percentile but understated 1.21 percent at the 75th percentile.

Table 2: Descriptive Statistics for the property-held sample for the years 2003-2008

Year	N	Mean	St.Dev.	Q1	Q2	Q3
Panel A: Annual revaluation (RA)						
2003	1120	0.85%	2.75%	0.00%	0.00%	0.23%
2004	1201	0.96%	2.78%	0.00%	0.00%	0.55%
2005	1477	0.61%	2.51%	0.00%	0.00%	0.43%
2006	1797	0.59%	2.39%	0.00%	0.00%	0.16%
2007	2034	0.96%	2.99%	0.00%	0.00%	1.14%
2008	1031	0.31%	2.65%	0.00%	0.00%	0.08%
Total	8660	0.73%	2.70%	0.00%	0.00%	0.47%
Panel B: Annual return implicit in two sequential appraisal estimates (RIMP)						
2003	1120	0.26%	3.64%	-1.02%	0.00%	1.78%
2004	1201	0.81%	3.34%	-0.73%	0.21%	2.32%
2005	1477	0.71%	3.35%	-0.71%	0.49%	2.17%
2006	1797	1.15%	3.71%	0.00%	0.44%	2.07%
2007	2034	0.78%	3.94%	-0.58%	0.25%	1.96%
2008	1031	0.12%	3.15%	-1.08%	0.00%	1.37%
Total	8660	0.70%	3.60%	-0.71%	0.21%	1.96%
Panel C: Return Differences (RDIF=RIMP-RA)						
2004	856	-0.62%	3.47%	-1.72%	-0.42%	0.72%
2005	1011	0.16%	3.28%	-1.34%	-0.23%	1.48%
2006	1259	0.18%	3.78%	-1.17%	0.10%	1.84%
2007	1322	0.90%	4.10%	-0.89%	0.51%	2.49%
2008	820	-0.13%	3.23%	-1.64%	-0.18%	1.48%
Total	5268	0.18%	3.68%	-1.23%	-0.06%	1.72%

RA represents the annual revaluation increase/decrease fixed by fund managers for a specific property in year t ; RIMP is defined as the annual return implicit in two sequential appraisals; RDIF is computed as the difference of RIMP at the beginning of the year and RA;

Fund-held sample

Regarding our tests about discretionary asset value changes, our empirical analyses rely on fund-year observations. Market value data are obtained from *CMVM*'s information system and basic financial statement items are hand-collected for the same period (2002-2008). The fund-held sample consists of 135 real estate investment funds (86% of the total number of real estate investment funds of 2008) and 453 fund-year observations for which all required data are available for at least two consecutive years. Fourteen of these funds are open-end real estate investment funds, being the remaining closed-end real estate investment funds. We decide to exclude special real estate investment funds not only because they are created very recently but also because they are not representative of

for our study once they have very specific purposes. In 2008, our sample registers a NAV of € 8.9 billion which represents about 84% of the NAV of total real estate investment funds. Five of the biggest open-end real estate investment fund²¹ register in 2008 a GAV of € 3 billion, about 30% of the total sample.

Table 4 evidences descriptive statistics for the fund-held sample. In the sample, open-end real estate investment funds are larger than closed-end real estate funds presenting a mean (median) net asset value of €325 (€211) million versus €55.5 (€24.2) million. The average for the dependent variable *AVC* ranges from -0.09 to 2.07 with a mean of 0.045, indicating that asset value changes represent on average 4,5% of the total asset value of our sample. Regarding signed *DAVC*, we can observe that the difference of the number of income increasing earnings management (*DAVCPOS*) and income decreasing earnings management (*DAVCNEG*) is relatively small. On average, the asset value changes fixed by fund managers is about 0.083 higher or lower than it would be expected in “normal” conditions.

The mean total return for our sample is about 14.4% with a high standard deviation of 43.8%. It should be referred that this value decreases from 16.6% in 2007 to 6.9% in 2008, reflecting the beginning of the financial crisis that we are going through. The cash flow variable registers a mean (median) of 14.9%. Contrarily to what would be expected, closed-end funds present a relatively high number of capital increase with a mean cash flow of 13.2% of total assets vs 22.3% for open-end real estate investment funds. We also can observe in table 3 that 58% of real estate funds in our sample are audited by Big N auditors firms and 47% are managed by fund management companies that are integrated in financial groups.

²¹ Gespatrimónio, Fundimo, BPN Imonegócios, Banif Imopredial and AF Portfolio.

Table 3: Descriptive Statistics for the fund-held sample for the years 2003-2008

Year	N	Mean	St. Dev.	Q1	Q2	Q3
<u>Dependent Variable:</u>						
<i>AVC</i>	406	0.045	0.150	0.000	0.008	0.034
<i>DAVC</i>	406	-0.005	0.102	-0.073	-0.009	0.068
<i>VABSDAVC</i>	406	0.083	0.060	0.038	0.069	0.119
<i>DAVCPOS</i>	189	0.083	0.055	0.040	0.071	0.124
<i>DAVCNEG</i>	217	-0.082	0.064	-0.114	-0.067	-0.035
<u>Other Variables</u>						
<i>TReturn</i>	406	0.144	0.438	-0.001	0.038	0.133
<i>RC</i>	406	0.036	0.037	0.000	0.026	0.068
<i>Others</i>	406	0.038	0.041	0.016	0.031	0.046
<i>CFlow</i>	406	0.149	0.677	0.000	0.000	0.000
<i>Rdist</i>	406	0.023	0.118	0.000	0.000	0.013
<i>OccupancyRate</i>	406	0.444	0.404	0.000	0.376	0.857
<i>Potential Gain</i>	406	0.288	0.607	0.037	0.091	0.225
<i>Daudit</i>	406	0.579	0.494	0.000	1.000	1.000
<i>Dfinance</i>	406	0.473	0.499	0.000	0.000	1.000
<i>Age</i>	406	6.090	5.240	2.000	4.000	10.000
<i>NAV Open-end Funds (€ Million)</i>	74	325.0	349.0	117.0	211.0	411.0
<i>NAV Closed-end Funds (€ Million)</i>	332	55.5	67.1	9.1	24.2	79.4

AVC represents the annual asset value change (unrealized gains) recognized each year by fund managers modeled as a function of different variables presented above; DAVC is the discretionary asset value change which can be divided in positive DAVC (DAVCPOS) and negative DAVC (DAVCNEG) .

Table 5 presents a correlation matrix with Pearson correlations. The correlations between the dependent variable (*AVC*) and each of the explanatory variables presented in the first column are not all statistically significant in the predicted direction as for it happens with Rents Collected (*RC*) and Cash Flows (*CFlows*). Nevertheless, we find a strong positive correlation between *AVC* and the sum of administrative costs (*Others*) and dividends distributed (*Rdist*).

Table 4: Correlations among the Dependent Variable (AVC - Asset Value Change) and Explanatory Variables

	<i>AVC</i>	<i>NAV</i>	<i>RC</i>	<i>Others</i>	<i>Rdist</i>	<i>CFlow</i>	<i>GDP</i>	<i>Irate</i>	<i>TReturn</i>
<i>AVC</i>	1.000								
<i>NAV</i>	-0.022	1.000							
<i>RC</i>	0.006	0.1398*	1.000						
<i>Others</i>	0.5737*	-0.020	0.2575*	1.000					
<i>Rdist</i>	0.8636*	-0.041	0.1669*	0.4897*	1.000				
<i>CFlows</i>	0.003	0.5332*	-0.031	0.1311*	-0.028	1.000			
<i>GDP</i>	0.065	-0.001	0.025	-0.069	0.014	0.010	1.000		
<i>Irate</i>	0.084	-0.167*	-0.2802*	0.046	0.063	-0.1129*	0.1634*	1.000	
<i>TReturn</i>	0.5153*	0.073	0.1314*	0.3180*	0.4801*	0.5168*	0.092	-0.061	1.000

*Pearson correlations significant at $p < 0.05$

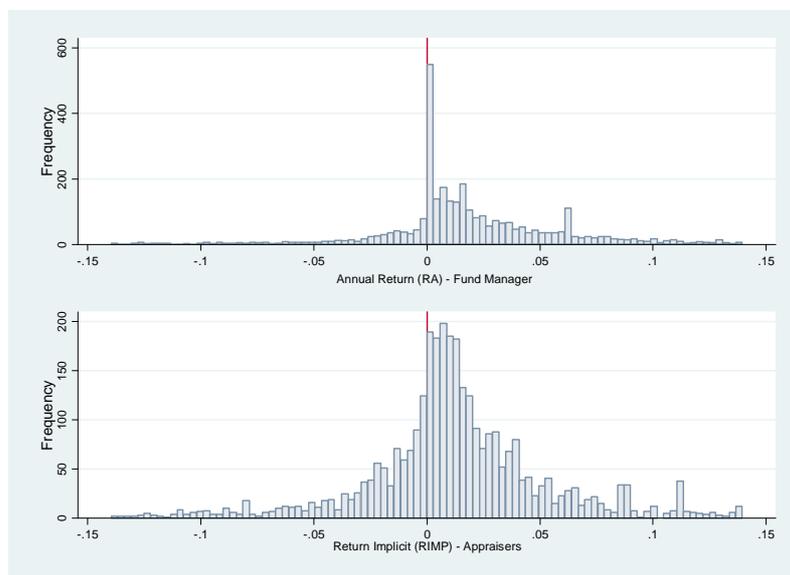
6. Analysis and Results

(i) *The distribution of Return Rate Difference (RDIF)*

Negative values of our variable RDIF represent situations for which fund managers are being less cautious in the recognition of unrealized gains compared to appraisers' recommendations. In our first hypothesis, we expect to find in our property sample a large number of observations with negative Return Rate Difference (RDIF) in the interval near zero.

Figure 1 plots the empirical distribution of the annual property revaluation fixed by fund managers (RA) and recommended by appraisals (RIMP), where the data are pooled temporally and cross-sectionally. We can observe that fund managers avoid registering decreases in properties values. There is evidence that for negative returns the cumulative percent frequency of RIMP is always higher than for RA (figure unreported). The kolmogorov-Smirnov test for equality of distribution functions suggests that there is a statistically significant difference between the underlying distributions. When appraisers recommend a depreciation of the property, fund managers rarely accompany this decrease. In most cases, fund managers maintain the property value unchanged (69.3%) or even register a slight increase (16.5%).

Figure 1: Histogram for Annual Return (RA) and Return Implicit in appraisals (RIMP)



Histogram of Annual Return fixed by fund managers (RA) and annual return implicit in two sequential appraisals (RIMP). These two variables were computed for each properties included in 150 REIFs for the period of 2003-2008 (N=8660 observations).

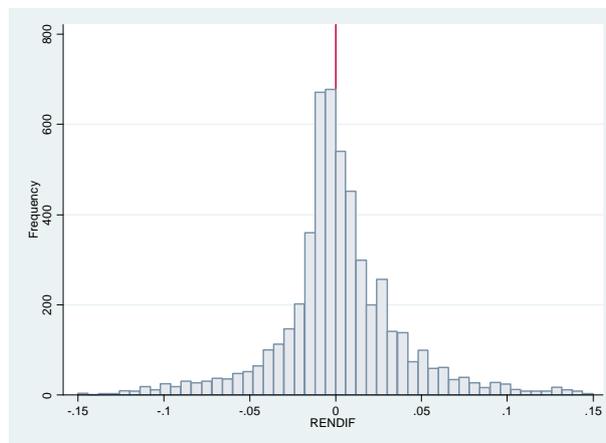
Figure 2 presents the empirical distribution of the variable $RDIF^{22}$, variable computed as the difference between the property revaluation recommended by appraisers and the increment fixed by fund managers. In the hypothesis of no earnings management, we assume that managers will follow appraisers' recommendations and that the distribution would be symmetric around zero. The figure shows that the distribution is not symmetrical, with the observation of more frequent negative scores $RDIF$ (positively skewed). Using a statistical test similar to Burgstahler and Dichev (1997), we observe that for the two interval to the left of zero, values of negative values occur more frequently than expected in a smooth distribution and that values of $RDIF$ slightly greater than zero occur less frequently than expected. The standardized differences for the intervals left zero are 4.0 and 2.6 respectively (for the intervals right of zero we have -1.5

²² The bin width used was $2(IQR)n^{-1/3}$, where IQR is the sample interquartil range of the variable and n is the number of available observations (Degeorge et al. (1999)).

and $-0.5)^{23}$. Therefore, we have some evidence that the asset value change fixed by managers seems to be systematically higher than appraiser's recommendation.

If we assume that in the absence of a discretionary behaviour of fund managers, the empirical distribution should be approximately symmetric around zero and that the right half of this distribution is not affected by earnings management, we can consider, as in Burgstahler and Dichev (1997), that the right half of the distribution can be used as expected frequencies in the corresponding interval in the left half of the distribution. Using this model and considering three intervals including negative RDIF of $(-0.006,0)$, $(-0.0012,0)$ and $(-0.0018,0)$, the difference between the number of scores observed and expected is 148, 369 and 427 respectively. These estimates represent up to 8% of the total available observations and up to 16% of the total number of observations with negative RDIF. This reinforces the evidence of too many negative RDIF around zero.

Figure 2: Histogram for Return Rate Difference – RDIF



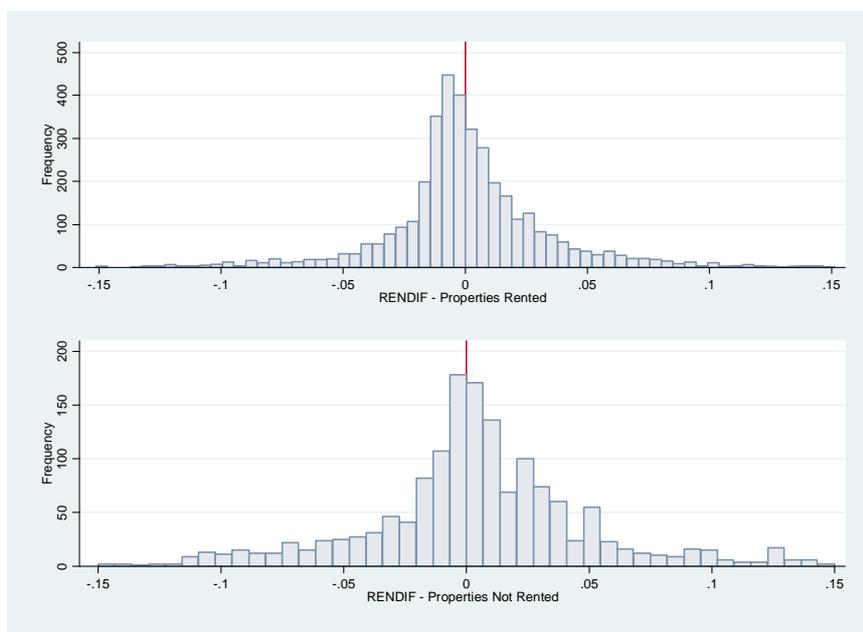
Histogram of Return Rate Difference – RDIF which is defined as the difference of property return difference of annual return implicit in two sequential appraisals (RIMP) at the beginning of the year and the annual revaluation increase/decrease fixed by fund managers (RA) for a specific property for period t . RDIF was computed for properties included in 150 REIFs for the period of 2004-2008 ($N=5,268$ observations).

²³ As in Burgstahler and Eames (2006), we conduct tests based on grouped zero and negative RDIF, as well as, tests based on zero and negative RDIFs separately. We obtained similar results.

A second step in the analysis of the fund managers' behaviour is the study of the incentives that can lead to what we observe earlier. As rental income represents the principal revenue source of real estate investment funds, we hypothesize that earnings manipulation incentives become stronger for properties that are not rented. Therefore, we conduct similar tests dividing our property sample into two subgroups: property rented and not rented. We expect to find a more pronounced effect of earnings management for properties that are not rented.

Nevertheless, results do not confirm our prediction. In figure 3, we can detect an irregularity near zero only for properties that are rented which seems to evidence that managers are more aggressive in unrealized gains recognition. If we consider that in the right half of the distribution, values are not influenced by earnings management, we can observe that for properties not rented, the number of negative RDIF is very similar to what is expected in this model. In the interval around zero, there are only 10 cases with a negative RDIF higher than expected.

Figure 3: Histogram for Return Rate Difference – RDIF for Rented and Not Rented Properties



Histogram of Return Rate Difference – RDIF for each category of properties: properties rented and not rented. RDIF is defined as the difference of property return difference of annual return implicit in two sequential appraisals (RIMP) at the beginning of the year and the annual revaluation increase/decrease fixed by fund managers (RA) for a specific property for period t . RDIF was computed for properties included in 150 REIFs of 2004-2008. The first sub-sample with properties that are rented includes 3754 observations. The second sub-sample which includes properties that are not rented comprises 1514 observations.

We conduct a similar analysis splitting the sample into open-end and closed-end funds according to our second hypothesis. Nevertheless, we are not able to see any significant difference in fund managers' behavior between the two groups.

The weak evidence in finding the incentives that can motivate fund managers' behavior can be related to other factors that are not included in this first analysis. Therefore, in order to investigate such features, a multivariate analysis should be conducted at the fund level. Further in this work, we will conduct such analysis.

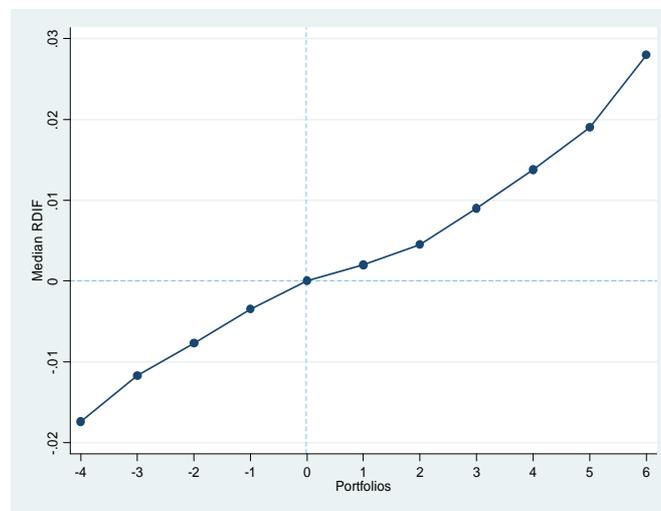
Previous literature²⁴ has documented that firms manage reported earnings to avoid earnings decreases and losses, to meet analyst forecasts or prior to the issuance of new debt or equity issuance. Similarly, we expect that for real estate investment funds, managers will manage earnings upward in order to contradict a negative appraisal revaluation.

Therefore, we examine the distribution of RDIF conditional on annual return implicit in appraisal estimates – RIMP. We sort observations on the variable RIMP to form equal-sized portfolios of 475 observations per portfolio and for each portfolio analyse the median and mean of RDIF. Under the null hypothesis of no earnings management, RDIF is expected to be closed to zero in each of the portfolios. A negative RDIF implies that fund managers decide to fix the property revaluation increment above the return estimated by appraisers for the previous period. If we consider that appraisal estimates may be interpreted in this sector as a benchmark for fund managers, a negative RDIF means that fund managers are fixing properties values above this forecast, being more aggressive in unrealized gains recognition.

²⁴ See for example Burgstahler and Dichev (1997), Burgstahler and Eames (2006), Dechow et al. (2000) and Dietrich et al. (2000)

Figure 4 shows that in portfolios for which appraisers register a depreciation of the property which can be considered as a “bad news”, fund managers avoid reflecting such estimate. Nevertheless, for portfolios which record higher appraisal estimates which can be viewed as “good news”, fund managers register lower properties increments with an increase of RDIF, being more cautious in unrealized gain recognition.

Figure 4: Distribution of median percentage of RDIF_t conditional on RIMP



Distribution of the median return rate difference – RDIF, conditional on the return implicit in appraisal estimates. RDIF is defined as the difference of property return difference of annual return implicit in two sequential appraisals (RIMP) at the beginning of the year and the annual revaluation increase/decrease fixed by fund managers (RA) for a specific property for period t . Observations were sorted on variable RIMP to form equal-sized portfolios of 475 observations per portfolio.

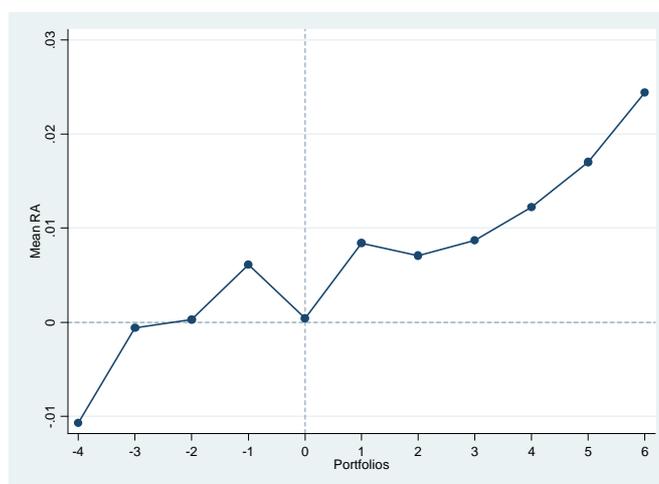
In table and figure 6, we can observe that for the first portfolio to the left of zero, despite the negative valuation’s appraiser (the mean of RIMP for this portfolio is -0.15%), the mean RA is of 0.61%. These findings are consistent with our prediction that there is reluctance from managers in registering a depreciation of properties.

Table 5: Statistics of RDIF of portfolios formed by the sign of variable RIMP

Annual RIMP	Portfolios	Mean RDIF	Mean RA	Perc.Neg.RDIF
<-2.36%	-4	-1.74%	-1.07%	61.52%
-2.36% to -1.01%	-3	-1.17%	-0.06%	78.10%
-1.01% to -0.47%	-2	-0.77%	0.03%	82.48%
-0.47% to 0%	-1	-0.35%	0.61%	80.76%
0%	0	0.00%	0.04%	13.90%
0% to 0.39%	1	0.20%	0.84%	32.00%
0.39% to 0.88%	2	0.45%	0.71%	39.81%
0.88% to 1.54%	3	0.90%	0.87%	36.00%
1.54% to 2.65%	4	1.38%	1.22%	31.24%
2.65% to 4.28%	5	1.90%	1.70%	34.10%
>4.28%	6	2.80%	2.44%	29.90%

Statistics on the earnings management measure RDIF across the distribution conditional on the return implicit in appraisal estimates. RDIF is defined as the difference of property return difference of annual return implicit in two sequential appraisals (RIMP) at the beginning of the year and the annual revaluation increase/decrease fixed by fund managers (RA) for a specific property for period t. After sorting observations in ascending order of annual RIMP, equal-sized portfolios are formed with 475 observations per portfolio. The first column lists the magnitude of annual RIMP. The second column lists the portfolio relative to zero. The third and fourth columns report the mean of RDIF and mean of RA for each portfolio. The last column reports the percentage of observations in each portfolio that register a negative value of RDIF.

Figure 5: Distribution of mean percentage of RA conditional on RIMP



Distribution of the mean RA, conditional on the return implicit in appraisal estimates. RA represents the annual return fixed by fund managers for a specific property. Observations were sorted on variable RIMP to form equal-sized portfolios of 475 observations per portfolio.

Consistent with these results, table 6 reveals a significant shift in the percentage of negative RDIF in portfolio zero²⁵. Portfolios to the left of zero which register negative values of appraisers' estimates present a high percentage of negative values of RDIF

²⁵ For each portfolio, we compute the percentage of observation with a negative value of RDIF.

(about 80%), revealing that fund managers avoid to follow appraisers' recommendation. In portfolio zero, which include properties for which appraisers suggest to maintain the value unchanged, fund managers seem to incorporate such advice, as in the great majority observations, fund managers do not reevaluate the property (in 85% of the cases).

Finally, we also computed the percentage of negative values of our variable RDIF for each of the years of our sample which we report in table 7, together with the annual capital growth of the Portuguese IPD index²⁶. Despite the very low number of observations available, we can observe a negative correlation between the percentage of negative RDIF and the capital growth of the index²⁷. The upward trend shift, observed in 2008, regarding the percentage of negative RDIF may indicate that fund managers' behaviour in avoiding depreciation of properties will be related to the market real estate performance.

Table 6: Temporal trend of the percentage of negative RDIF

Year	Perc. Neg.RDIF	IPD C.Growth
2004	44.88%	3.40%
2005	38.25%	3.10%
2006	34.06%	5.50%
2007	26.84%	5.80%
2008	42.68%	-3.30%

(ii) Discretionary Asset Value Changes

Univariate Results

Table 7 presents the univariate analysis of Discretionary Asset Value Changes pooled across the years between 2003 and 2008. As *DAVC* is estimated as the error term of the regression of expected annual Asset Value Changes, the mean of *DAVC* is not statistically different from zero. Nevertheless, considering the absolute value of *DAVC*, we can observe that the mean (median) of discretionary is 8.3 percent (6.99 percent) of total assets. Both *t*-test and signed rank test indicate that this value is statistically

²⁶ In Portugal, IPD index from Investment Property Databank is computed annually by IPD/Imométrica since 2000. This index is based on a sample of 810 properties covering €9.2bn at the end of December 2009 (www.ipd.com).

²⁷ The Spearman Rank correlation is -0.7, but it is not statistically significant.

significant suggesting that discretionary asset value changes are different from zero and, consequently, that fund managers can use their flexibility to manage fund earnings.

When the sample is split according to the type of fund, we find that the mean (median) of *DAVC* for open-end real estate investment fund is higher than for closed-end funds. This result is not in line with our hypothesis. The difference of the mean (median) between the two types of funds is 5.97 percent (8.6 percent) of total assets (p -value < 0.01).

In table 8, we also observe that the difference in *DAVC* mean (median) between funds that are audited by Big N and non-Big N auditing firms is slightly significant²⁸. The same occurs when the sample is split into funds that are integrated in a financial group and funds that we defined as independent of this type of ownership. Nevertheless, as there are other factors that can influence the level of *DAVC* and consequently can influence the significance of these tests, we report in the next section the results of our multivariate analysis (Becker *et al.* (1998)).²⁹

²⁸ In our sample, we consider five international auditing companies: PWC, Deloitte, KPMG, Ernst&Young and BDO)

²⁹ We also conduct the same tests by year, comparing the six annual means (medians) *DAVC* for each group. Results are very similar.

Table 7: Univariate Discretionary Asset Value Changes tests**Panel A: Discretionary Asset Value Changes**

	N	Mean	Median
Discretionary Asset Value Changes (DAVC) (two-tailed <i>p</i> -value)	406	-0.0054 (0.2822)	-0.00864 (0.4304)
Absolute Value of DAVC (two-tailed <i>p</i> -value)	406	0.0830 0.0000	0.0699 0.0000

Panel B: Discretionary Asset Value Changes by Type of Fund

	Open-End Funds			Closed-End Fund			Differences across Groups	
	N	Mean	Median	N	Mean	Median	Mean	Median
Discretionary Asset Value Changes (DAVC) (two-tailed <i>p</i> -value)	74	0.0434 (0.0001)	0.0667 (0.0003)	332	-0.0163 (0.0035)	-0.01916 (0.0040)	0.0597 (0.0000)	0.08586 (0.0000)
Absolute Value of DAVC (two-tailed <i>p</i> -value)	74	0.0880 (0.0000)	0.0756 (0.0000)	332	0.0819 (0.0000)	0.0662 (0.0000)	0.01 (0.4322)	0.01 (0.1157)

Panel C: Discretionary Asset Value Changes for a sample of Big N and non Big N Auditors

	Big N Auditors			Non-Big N Auditors			Differences across Groups	
	N	Mean	Median	N	Mean	Median	Mean	Median
Discretionary Asset Value Changes (DAVC) (two-tailed <i>p</i> -value)	235	0.0021 (0.7457)	0.0049 (0.5756)	171	-0.0159 (0.0479)	-0.0149 (0.0539)	0.018 (0.0796)	0.0198 (0.0702)
Absolute Value of DAVC (two-tailed <i>p</i> -value)	235	0.0831 (0.0000)	0.0759 (0.0000)	171	0.0830 (0.0000)	0.0620 (0.0000)	0.02 0.9915	0.01 (0.4742)

Panel D: Discretionary Asset Value Changes for a sample of funds integrated in a financial group and non-financial group

	Financial Group			Non-Financial Group			Differences across Groups	
	N	Mean	Median	N	Mean	Median	Mean	Median
Discretionary Asset Value Changes (DAVC) (two-tailed <i>p</i> -value)	192	-0.0155 (0.0349)	-0.0174 (0.0722)	214	0.0035 (0.6155)	-0.0044 (0.5571)	-0.019 (0.8211)	-0.013 (0.0675)
Absolute Value of DAVC (two-tailed <i>p</i> -value)	192	0.0843 (0.0000)	0.0708 (0.0000)	214	0.0819 (0.0000)	0.0692 (0.0000)	0.002 (0.6853)	0.002 (0.4113)

This table presents results from univariate analysis of discretionary asset value changes. For each group, *p*-values for the means are from *t*-tests and *p*-values for median are from signed rank tests. For the differences across groups, *p*-values for means are from *t*-tests and *p*-values for medians are from two-sample Wilcoxon rank-sum (Mann-Whitney) tests.

Multivariate Results

The appliance of the hausman test to our sample for the first regression leads us to estimate the parameters of the first model through the application of a fixed effect model.

Table 8 presents the result for this first regression:

Table 8: Panel Data Model of Expected Annual Asset Value Changes

$$\begin{aligned}
 \text{Model 1: } \quad AVC_{i,t} &= \alpha + \beta_1 NAV_{i,t-1} + \beta_2 RC_{i,t} + \beta_3 Others_{i,t} + \beta_4 Rdist_{i,t} + \beta_5 CFlow_{i,t} \\
 &\quad + \beta_6 GDP_{i,t} + \beta_7 Irate_{i,t} + \beta_8 TReturn_{i,t} + u_{i,t} \\
 \text{where } u_{i,t} &= \mu_i + v_{i,t}
 \end{aligned}$$

Variable	Coefficient	p-value
Intercept	-0,0111	0,521
NAV	0,0339	0,035
RC	-0,0853	0,003
Others	0,9729	0,000
RDIST	0,8106	0,024
Cflow	-0,0417	0,006
GDP	0,6381	0,000
Irate	-0,7734	0,043
Treturn	0,0695	0,001
N° Observations	406	
N° of Groups	135	
R-sq:		
Within	0,4449	
Between	0,9374	
Overall	0,8314	
Rho	0,5644	(fraction of variance due to ui)

Fixed effect estimators for Annual Asset Value Change (*AVC*); *NAV* is the fund net asset value; *RC* is the total amount of rents collected; *Others* is the sum of administrative costs net of other returns, *Rdist* are dividends distributed and *CFlow* is the net cash flow received from subscriptions and/or paid from redemptions for open-end real estate funds and capital increase or decrease for closed-end real estate funds. *GDP* is the gross domestic product, *IR* is the interest rate and *TReturn* is the annual total return fund. All fund variables are scaled by NAV_{t-1} .

The parameters are statistical significant at the p-value ≤ 0.05 level. Rents collected and Cash Flows are inversely related with *AVC*. If there is an increase in rents collected, funds can have lower unrealized gains recognized. An increase of cash flows represents the possibility of additional investments which can allow fund managers to fixed lower asset value changes. On the contrary, *RDIST* and *Others* influence positively *AVC*. Regarding *RDIST*, a raise of dividend payout can lead fund managers to increase property values. Concerning *Others*, as the dominant component of this variable is fund commissions, we can expect that an increase in this variable will lead to an increase of unrealized gains. As found in previous literature, *GDP* is highly significant, influencing

positively real estate prices. The regression registers a high overall R-squared of 0.83. The estimation of rho (0.56) suggests that a significant part of the variance in *AVC* is related to fund differences in asset value changes.

Discretionary asset value changes (*DAVC*) are then computed as the difference between total asset value changes and expected asset value changes. Table 9 presents the results from regressing signed measures of discretionary asset value changes on different variable that are expected to influence fund managers behaviour.

Table 9: Discretionary Asset Value Changes Tests

Model 2: $DAVC_{i,t} = \alpha + \beta_1 VacancyRate_{i,t} + \beta_2 PotentialGain_{i,t} + \beta_3 FundType_{i,t} + \beta_4 Daudit_{i,t} + \beta_5 DFinance_{i,t} + \beta_6 Age_{i,t} + \beta_7 Assets_{i,t} + \varepsilon$							
	Panel A: Signed DAVC		Panel B: Positive DAVC		Panel C: Negative DAVC		
Variable	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	
Intercept	-0,1864	0,007	0,1666	0,016	-0,2311	0,001	
Vacancy Rate	-0,0563	0,007	0,0082	0,736	-0,0071	0,666	
PotentialGain	-0,0110	0,180	-0,0009	0,881	-0,0160	0,042	
FundType	0,0312	0,057	0,0375	0,003	-0,0352	0,057	
Daudit	0,0119	0,228	0,0028	0,729	0,0015	0,858	
Dfinance	-0,0194	0,058	-0,0271	0,004	-0,0074	0,408	
Age	0,0021	0,068	-0,0017	0,054	0,0022	0,073	
Assets	0,0100	0,033	-0,0039	0,324	0,0087	0,036	
<i>n</i>		406		190		216	
Adj. R Squared		0,12		0,03		0,06	

This Table presents results for a Pooled OLS Regression of Discretionary Asset Value Changes. The dependent variable *DAVC_{i,t}* is the signed value of the abnormal asset value change estimated in the previous equation. We also separate *DAVC_{i,t}* into strictly positive values (*DAVCPOS_{i,t}*) and strictly negative (*DAVCNEG*). *Vacancy Rate* represents the rate of vacancy for a fund. *Potential Gain* is the difference between the average of the appraisals made by the two independent appraisers and the total asset value fixed by fund managers. *Fund Type* is a dummy variable equal to one if the fund is an open-end real estate investment fund and zero if it is a closed-end real estate investment funds. *Daudit* is a dummy variable used to indicate if the fund is audited by a Big N audit firm (=1) or by a non-Big N audit firm (=0). *DFinance* is a dichotomous variable to differentiate funds that are included in a financial group (=1) from funds that which are managed by independent fund management company. The remaining two control variables are included to control for fund age (*Age*) and fund size including the log of total assets (*Assets*).

Contrary to our hypothesis, the coefficient for fund type is positive (significant at $p < 0.10$). Open-end real estate investment funds lead to higher values of *DAVC*. Therefore, the more strict regulation of this type of funds does not seem to provide higher monitoring of fund managers. This result is consistent with the findings of Duque and

Barros (2002) who conclude that the pressure of issuing units in a daily basis can cause pressure on fund managers to manipulate properties valuation. Further examination of the results reinforces this finding, as open-end funds are positively related with positive *DAVC* (income increasing behaviour) and negatively associated with negative *DAVC* (income decreasing earnings management).

The lack of association between *Vacancy Rate* and *DAVC* is contrary to H3's prediction that real estate investment funds with higher vacancy rate are more likely to register earnings management actions.

The lack of significance for the *Daudit* in panel A, B and C do not support H4 and are not in line with the majority of the auditing literature. The fact that the fund is audited by an international auditing firm does not explain the level of discretionary asset value changes.

Finally, the coefficient on *Dfinance* is significantly negative in the three panels, suggesting that funds that are integrated in a financial group present lower levels of discretionary asset value changes. This result is in line with a strand of corporate governance literature which suggests that institutional investors can play an important monitoring role (Carleton W. et al. (1998) and Smith (1951)). The real estate investment funds that are integrated in a financial group are more likely to be control by fund management company shareholders and therefore can reduce the level of earnings management.

7. Conclusions

In this first paper, we attempt to investigate the strategic manipulation of the net asset value of real estate investment funds by fund managers and determine the main factors that can motivate such behavior. Under the Portuguese Law, fund managers of real estate investment funds have some discretion over property value as they can fixed it periodically in the interval between the acquisition cost and the average of the appraisal values attributed by two independent appraisers.

With this aim in view, we first analyze the cross-sectional distribution of a variable named RDIF - Return Rate Difference computed as the difference between the annual asset value increments fixed by fund managers and the annual appraisal changes recommended by appraisers. The observation of unusually high frequencies of negative values of this variable can evidence that fund managers are using their discretion to manipulate earnings.

Our first findings suggest that fund managers use their allowed flexibility to manage investors' earnings through the recognition of the asset value revaluation increments (unrealized gains) that arise from funds assets. This behaviour seems to be adopted in order to contradict an unfavourable appraisal estimate.

In a second part of the work, in order to understand fund managers incentives, we seek to test different hypothesis to examine if fund characteristics as fund type, dimension or fund vacancy rates can stimulate earnings management actions. The analysis is conducted after estimating a proxy for Discretionary Asset value changes (DAVC).

Findings suggest that open-end real estate investment funds register higher level of discretionary asset value changes than closed-end real estate investment funds, evidencing a possible pressure on fund managers as units are issued in a daily basis. On the other hand, we also conclude that real estate investment funds that are integrated in a financial group register lower levels of discretionary asset value changes which can be explain by the possible higher activism by fund management company shareholders in monitoring fund managers behaviour. Finally, the percentage of vacancy rate of the fund and the fact that the real estate investment fund is audited by one of the Big-N auditing firms have no significant impact in fund manager behaviour.

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