Chinese Business Review, Feb. 2018, Vol. 17, No. 2, 53-75
doi: 10.17265/1537-1506/2018.02.001

The Effects of Gross vs. Net Asset Value-Based Managers' Compensation on REIT Capital Structure and Performance: Evidence From the Italian REIT Market

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Investors should always argue about management fees because of their impact on net performance that can be substantial. This especially for investments, like real estate, which require intensive management. However, different from traditional mutual funds that are usually related to the gross value of the assets under management, but similar to other financial industry sectors (e.g. hedge funds and private equity funds), REIT managers' compensation structure typically provides a basically fixed payment based alternatively on gross asset value (GAV) or net asset value (NAV). In addition, managers usually also gain a performance fee. The paper analyses how the two alternative compensation schemes influence REITs' investment decisions and capital structure and, consequently, REITs' share value and performance. The final issue addressed is whether—and under which conditions—one compensation scheme is superior to the other. Due to the (usual) market price discount on NAVs, both fee structures incentivise managers to leverage—even in a tax-free environment—in order to maximize the management fees. However, the leverage motivation is stronger for GAV-based than for NAV-based REITs, which are also expected to be more selective in investment decisions. Overall, considering initial fee percentage, GAV-based REITs are expected to execute higher management fees than NAV-based REITs due to the relevant leverage effect. Moreover, debt recourse produces different effects on share value if measured upon market price or net asset value. The empirical analysis focuses on public Italian REITs (2002-2012). The results seem to support the theoretical expectations. GAV-based REITs experience higher debt trends and levels than NAV-based REITs. At the same time, GAV-based REITs register lower real estate asset returns gross and net of management fees for both current and growth yields. Differences in the returns lead to permanent higher performances over total return indexes of NAV-based REITs compared to GAV-based REITs.

Keywords: manager compensation, leverage, REIT governance, financial constraints, performance, value-weighted price index

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Introduction

Especially for investments that require intensive delegated management, like financial real estate, the impact of management fees on net performance can be substantial. This is why investors and, relatedly, financial service firms should argue about the management fees in respect both to their absolute value and, especially, their composition.

However, investors, particularly retail investors, cannot easily assess what form of compensation is best for them and readily make sub-optimal choices (Ontario Securities Commission, 2015).

In that respect it is of key relevance to understand, other things equal, the implications of various management fee structures in terms of behavioral effects on investment managers' decision making and, in turn, of static effects on net returns. In fact, the design of proper compensation schemes compliant with investor protection plays a critical role in addressing potential opportunistic behaviors of managers and in aligning the different interests (Lecomte & Ooi, 2013). This is because the incentives embedded in the executive remuneration influence the investment and financial decisions of the managers and, in turn, the performance and output of the investment, at final stage.

In the traditional asset management industry (i.e. comprehending non-real estate mutual funds established as open-end pooled investment vehicles that invest in transferable securities like bonds and stocks upon investment styles and objectives) executive compensation, even if characterized by a high degree of variance, is largely determined in a fixed component, typically a constant percentage of the assets under management (AUM), equal to the total assets, and, eventually, in a variable incentive fee to be paid when the total return of the assets exceeds some minimum level. The determination of the reference parameter (i.e. AUM) for calculating the base fee component is not an issue for the mutual fund industry due to the inability of mutual funds to leverage. In the absence of debt, the value of the AUM always coincides with the net asset value.

Contrary to that, in other asset management sectors—like the financial real estate industry, the hedge funds and the private equity firms—the admitted use of leverage is an important feature of investment management so that the identification of the reference parameter for assessing the fixed fee component becomes a topical debate.

In that respect, due to the leverage option both for public and private entities, real estate investment trusts and funds (simply REITs hereafter), variously defined upon national legislation, are largely characterized—at least at European level—by the peculiarity that the reference parameter for calculating the fixed management fee is alternatively referred, below other possible parameters or blended solutions, to (i) the gross asset value (GAV) or (ii) the net asset value (NAV). GAV can be approximated by the total assets, while NAV equals the total assets minus the REIT's liabilities[1]. In addition, the remuneration contracts usually contain an incentive compensation that increases with the performance of the REIT.

In fact, a survey of the European Association for Investors in Non-Listed Real Estate Vehicles (INREV, 2012) shows that the most common basis for annual management fees of core European institutional investment vehicles is GAV (68.3%) while almost 23% of the investment structures use NAV, 8.9% applies

[1] NAV might differ from the so called drawn or invested capital which represents the initial or period by period drawn equity contributed by the shareholders. While the invested capital is basically static if not new equity is issued, the NAV is dynamic due to the fact that it reflects, below other factors, the valuation gains and losses of the real estate portfolio and increases by the net-earnings not distributed to the shareholders. A detailed definition of NAV is reported in Section 2.

other non-specified basis, but no clear trend towards one methodology by which management fees are computed. In addition, 81% of the reporting funds/trusts pay some kind of performance fees. In sum, management fees are the most relevant factor in the REIT total expense ratio calculation.

However, despite the market relevance of this noteworthy peculiarity, financial literature largely focuses on the broad agency problems embedded in REIT governance and management compensation (Anglin, Edelstein, Gao, & Tsang, 2013; Bauer, Eichholtz, & Kok, 2009; Ooi, 2009; Gosh & Sirmans, 2005) or analyzes, below others, the alignment of interests considering risk-adjusted performances or unexpected profits (Jr. Pagliari, 2013; Chopin, Dickens, & Shelor, 1995), but very limited attention has been dedicated to understanding the effects of the specific choice, between GAV or NAV, other things constants, as a reference value, on the REITs executive behavior within the comprehensive fee structure. This is quite surprising considering the fact that global market capitalization of REITs approximate 1.53 trillion Euro, worldwide (EY, 2016), making REITs be the dominant vehicle for financial real estate investments and a major asset in the overall portfolio of households and institutional investors.

This paper investigates how the two compensation options influence REITs' investment decisions and capital structure and, consequently, share value and performance at corporate level. The final issue addressed is whether—and under which conditions—one compensation scheme can be viewed as superior to the other, i.e. if REITs having a fee-structure based on net asset values (NAV-based REITs) outperform REITs with a compensation indexed on gross asset value (GAV-based REITs). This should allow market participants rationale fee structure's decisions in respect to the two fundamental alternative compensation schemes and avoid sub-optimal governance choices. As such the analysis does not aim to identify the best compensation scheme neither in absolute terms—given the fact that no single fee structure can be optimal in all circumstances—nor in relative terms (i.e. in respect to all potential fee alternatives). This is by considering Italian REIT market data and the related institutional context also because of the clear polarization of the compensation practices that allows better enucleating the research issue. The empirical analysis focuses on public REITs for the period 2002-2012[2].

Although the analysis focuses on (Italian) public REIT compensation practices as a test case, the research question is assumed to be of broader interest.

In fact, it potentially applies in general terms—provided that each context deserves detailed examination—to a large magnitude of investment vehicles (like private REITs, hedge funds of various investment sectors and private equity funds often organized as limited partnerships) having similar compensation structures in essence, using leverage and having the option of choosing, below other alternatives, one of the two reference values for calculating the invariant management fee component.

The analysis shows that also due to regulatory and market constraints, both fee-structures incentivise leverage in order to maximize the fixed management fee component where the motivation is maximum for GAV-based REITs and minimum for the NAV-based REITs because of the marginal effect. However, NAV-based REITs are expected to be more selective in investment decisions compared to GAV-based REITs because of the different compensation base. At the same time, leverage increases return volatility which, in turn,

[2] The time series limit considers the adoption, starting from 2013, of the new European Union regulation (EU 694/2014) with regard to the regulatory standards determining the types of alternative investment fund managers (AIFMD). Due to this regulatory break, the change over period of 2012/2013 has been taken as reference year for the regulatory and market data analysis of the present paper.

positively impacts on the option value embedded in the performance fee component. Moreover, the investment and capital structure decisions of the REITs managers aiming at maximizing their executive compensation may not result, mainly for GAV-based REITs, in a corresponding advantage to the investors in terms of REIT performance and share value in a corporate tax free context. In that respect, leverage produces different effects on REIT share value if measured upon market price or net asset value, and so on NAV discount, due to the different implicit valuation methodologies.

The empirical results seem to support the theoretical expectations. GAV-based REITs experience higher debt trends in respect to NAV-based REITs. At the same time, GAV-REITs register lower real estate asset returns net of management fees both for current as well as for growth returns. Differences in net real estate returns seem to lead to permanent higher performances of NAV-based REITs in respect to GAV-based REITs measured upon total return benchmarks. This is by calculating the yield upon market prices as well as net asset values of REIT shares.

The results have (REITs') corporate governance implications. If markets—like the real estate context that is characterized by informational asymmetry, product heterogeneity, and property complexities—are not perfectly competitive, market forces, especially in the retail investment sector, might not be able to drive managers' behaviors and, implicitly, management fees towards equilibrium levels. This is also considering the difficulties in assessing *ex ante* the targeted capital structure of REITs and the leverage volatility over time as market experience shows (Pavlov, Steiner, & Wachter, 2016). In such a context, the knowledge of which of the two compensation structures—this other things constant and beside other optimal solutions in terms of overall fee structures which is beyond the scope of this study—are superior to the other is expected to act as a twofold disciplining divide.

On the one side, it induces REIT investors to strengthen their corporate governance and, in turn, to discipline managers at various stages, by avoiding investing in REITs having inferior fee structures, at least in relative terms, by forcing managers—via shareholders meeting capable of replacing the REIT directors—to restyle the executive compensation structure in favor of a NAV-based remuneration, or by reducing the GAV-based fees to an amount compliant to the targeted capital structure and related leverage.

On the other side, it encourages rational financial service firms, often acting as REIT managers, to adapt their management fee structure—beside the choice of alternative compensation methodologies—to the investor interests and to provide, in perspective terms, compliant investment vehicles that would otherwise be avoided by knowledgeable investors. This is also in order to protect their market reputation and marginalize other non-adaptive market participants.

The study is structured as follows. Section 2 provides a brief overview of the current (Italian) REIT executive compensation practices by describing the management fee calculation variables. Section 3 describes the relevant literature that allows assessing the theoretical framework for explaining the expected effects on the investment decisions (i.e. asset risk) and capital structure choices (i.e. leverage) of REIT managers induced by the alternative of adopting the GAV or NAV as the fee calculation basis. The section also depicts the related effects of the induced investment and financing decisions on REIT share value and performance. The testable hypothesis arising from the theoretical analysis is developed and summarized in the final part of the same Section 3. The data and the methodology used to test these theoretical expectations are reported in Section 4, where the analysis of the Italian market is conducted and the empirical results are discussed. The conclusions are drawn in the final Section 5.

Fixed and Incentive REIT Managers' Compensation

The remuneration of (Italian) REIT[3] managers is characterized by a low variability and strong polarization in the compensation structures, making this market context a valuable laboratory for analyzing the research issue[4]. The practices for all public REITs (2013) are summarized in Table 1. Consistently with large part of the European investment vehicles showing a similar pattern as described above (INREV, 2012), compensation methods can be substantially divided in two general groups: 46% of all public REITs pay a basically "fixed" management fee as a percentage of the "gross asset value" of the REIT while 54% of the REITs refer to the "net asset value" as calculation base for the invariant fee component (but fluctuating in absolute terms from period to period because of the changes in the GAV/NAV levels). The fixed compensation represents the charges levied for the investment management services but excluding third-party costs and fund-level costs[5].

Table 1

Fixed Compensation Structure of Italian Public Equity REITS

Number of (public) equity reits	Calculation base	Mean annual management fees		
12	GAV		1.36%	
		Min. 0.73		max 1.9
14			1.61%	
		Min. 1.3		Max 1.9

Note. (Weighted) mean values, 2013 data. Source: Italian stock exchange, assogestioni and authors reclassification.

The average fixed compensation equals 1.36% for GAV-based REITs. The average invariant fee component for NAV-based REITs (1.61% of net assets) is quite close to the one of GAV-based REITs. The values are largely consistent with the European REIT data. INREV reports (2012, last publicly available data) that GAV-based management fees (0.6%) are, on average, 20 basis points (or 25%) lower than executive compensation based on NAV (0.8%).

[3] Italian REITs are structured as closed-end mutual funds. Closed-end refers to the duration of the investment structure, where maturity cannot exceed 50 years. As investment entities, Italian REITs are managed by an asset management company on behalf of the REITs shareholders (i.e. final investors). In that sense they are externally managed being the directors allowed to manage different funds. Italian REITs—as it is the case for most European real estate investment vehicles—are subject to severe regulatory burdens mainly aimed at constraining the REITs' investment operations and leverage in order to protect investors. Regulation is highest for public REITs and relaxed for private institutional entities. The regulatory constraints are off-set by a favorable fiscal regime, being REITs tax-free at corporate level. The analysis does not consider the SIIQ (Real Estate Listed Corporations) due to the fact that presently only two SIIQ are listed. The regulatory set of this section mainly refers to the vigilance rules enforced by the Bank of Italy (Bank of Italy, 2005; 2008; 2015) prior to the adoption of the European Alternative Investment Fund Managers Directive (AIFMD). Italian REITs are already substantially consistent with the new investment regulation (Bank of Italy, 2015).

[4] The amount, composition, and calculation basis of the management fees are detailed in the REITs articles of association. The management fee describes the remuneration paid to the asset management company administrating the REIT. Please note that asset related and financing expenses (e.g. acquisition and disposal costs, property and asset management expenses, debt arrangement fees) are carried by the REIT with the only exception of rejected investment project costs (so called "abortion costs") that are debited to the management company. Audit, custodian, and depository fees are fund expenses. The fixed fee component is paid on quarterly, half-yearly or yearly basis.

[5] Investment management services include e.g. strategic asset allocation and asset management, portfolio input and production of asset level business plans, accounting, fund administration and vehicle level managing, reporting activities at asset level and to shareholders (INREV, 2016). Third-party costs (*e.g.* auditing, depository banking, transaction costs directly related to acquisition and disposition of real estate assets, property & facility management) are charged at fund-level and are excluded from the management fees. No acquisition, development or disposal fees are paid to the managers.

It is noteworthy that compensation practice has not experienced a clear trend over time in terms either of preferred compensation basis (i.e. GAV vs. NAV) or of fee level rather than sectorial REIT specialization[6]. The latter observation can be ascribed to the market evidence that all Italian public REITs invest almost only in income producing, commercial core-properties (largely offices) located in the main metropolitan areas of Milan and Rome (i.e. concentrated in Italy) and are not allowed to change their investment policy in terms of target real estate portfolio. The cross-sectional heterogeneity of the Italian REIT population in terms both of geographical location and (core) investment style is therefore very limited; consequently the operating complexity of the properties and management strategies is likewise contained and homogenous.

By contrast, the missing dominance over time towards one fee methodology is more controversial due to the fact that in competitive markets, one would expect to observe a trend towards the compensation structure expected to be superior to the other. Real estate markets are however missing e.g. perfect information and equal access to data (Debreu, 1972) and real estate properties as well as real estate investment products are characterized by a high heterogeneity and information asymmetry that might prevent rational decision by investors and turn out, as described next, in sub-optimal decisions. At the same time, the limited gap of the management fee levels between the GAV-based and NAV-based REITs is surprising because the ability of REITs to leverage might significantly alter the reference basis for calculating the management fee leading to potentially significantly differences in the Dollar amount of the effective compensation. In that sense, one would expect the invariant fee charge to be defined in respect to the potential target REIT capital structure and to be therefore quite differentiated between GAV and NAV-based REITs in order to match the theoretical equivalence of the two reference basis if the leverage ratio (D/E) were known [$\text{Fixed Fee}_{\mathrm{GAV}} = \text{Fixed Fee}_{\mathrm{NAV}}(1-\mathrm{D})$]. However, the rationale of a predictable leverage ratio may become more tenuous if the debt level was time-dependent, e.g. due to real estate and capital market conditions, or if the indebtedness represented a wide range of potential outcomes altering the potential equivalence (Jr. Pagliari, 2013). As explained in the following sections, this reduced difference in the fixed compensation component is a key factor in driving the executives' decisions impacting on the REIT share value and performance.

The reference values are reported in the REITs (half-yearly and annual) financial statements, where the market value of the real estate assets is assessed every six month by independent appraisers. However, prudential regulation requests that valuation gains deriving from the periodic portfolio valuation are deducted from the calculation base both for GAV and NAV-based REITs. In that sense the invariant fee component is capped (i.e. limited to the gross or net asset value net of the unrealized valuation gains while considering valuation losses).

In addition, almost all REIT managers gain a variable performance fee when the REIT total return exceeds some minimum level. There is basically no difference between GAV-based and NAV-based REITs in the incentive compensation that takes, respectively, the average form of an 18.00% and 19.55% charge on the REIT total return surpassing a target yield. There is a good deal in variance in benchmarking the minimum target return which is defined *ex ante* in the REIT's articles of association and which has to be, by regulation, consistent with the REIT investment policy. Performance fees are often accrued but charged only at the end of

[6] The detailed description of the Italian REITs and the analysis of the group characteristics are reported in Section 4. Detailed data are available upon request.

the REIT's duration. However, some REITs pay performance fees on a yearly basis, adjusting the amount in the following year upon the REIT's economic return.

It is noteworthy that compensation practice has not experienced a clear trend over time in terms either of preferred compensation basis (i.e. GAV vs. NAV) or of fee level rather than sectorial REIT specialization. All Italian REITs invest almost only in income producing core-properties and are not allowed to change the investment policy in terms of target real estate portfolio.

GAV-Based REITs

In formal terms, the compensation structure of the GAV-based REITs over the entire duration (n) of the closed-end entity can be described as follows:

$$C_{GAV} = \sum_{t=0}^{n} \frac{m_{GAV} \times \min(\tilde{A}_t; A_{ACQ})}{(1+i)^t} + \frac{k \times NAV_0[(1+r)^n - (1+r^*)^n]}{(1+i)^n} \quad (1)$$

where m is the fixed fee rate, $\tilde{A}$ the RE assets' appraisal values, A_{ACQ} the acquisition price, k the fixed over-performance fee rate, r the REIT's total yield , r^* the hurdle return rate, i the opportunity cost of capital and NAV the net asset value.

The overall managers' compensation is a function: (i) of the fixed management fee rate (m_{GAV}); (ii) of the "capped" REIT's total assets (defined, in the hypothesis of a fully invested REIT, as the minor amount between the real estate portfolio market value ($\tilde{A}$) and the historical acquisition cost of the properties (A_{ACQ}); (iii) of the overperformance fixed fee rate (k) that is liquidated at the REITs maturity (iv) on the (positive) difference ($r - r^*$) between the REIT's total yield (r) exceeding the prefixed hurdle rate:

$$C_{GAV} = f[m_{GAV}; \min(\tilde{A}_t; A_{ACQ}); k; (r - r^*)] \quad (2)$$

The percentage charge of the invariant (m_{GAV}) and variable (k) fee components as well as the hurdle rate (r^*) are contracted *ex ante* and defined in the REIT's articles of association and not subject to change.

In respect to the invariant fee component, the management fee increases over time for every positive change in the total assets, the ladder being assumed to be fully invested in real estate. In turn, the total assets increase is function of the net investments (Net Investments) and the net asset value (i.e. net equity) changes (ΔNAV) between the end (t_{n+1}) and the beginning of every period of time (t_n), typically on a yearly or half-yearly basis.

Changes in net asset values result from the retained rate (rr) of the periodic net earnings (E) net of equity reimbursement or additional share issues in respect to the initial issued shares (Net Funds). In this respect, however please note that additional equity issues are *de facto* unfeasible for public REITs because Italian REITs shares trade at severe discount over net asset values. This market evidence combined with the regulatory constraint that obliges REITs to offer new shares at NAVs (being the net asset value the mandatory valuation standard) effectively impedes new equity issues (Biasin & Quaranta, 2010):

$$\Delta A = f[\text{Net Investments}; \Delta NAV(E; rr; \text{Net Funds})] \quad (3)$$

$$E_t = r_A \tilde{A}_t - r_D D_t - m_{GAV} \times \min(\tilde{A}_t; A_{ACQ}) \pm \text{Val\&}DispGainLosses \pm OtherProfitsLosses \quad (4)$$

where E is the net earnings and rr the net earnings' retention rate.

In turn, the net earnings contribution to the NAV changes depends on the main profit and loss accounts of interest defined as: (i) the current profits defined as the difference between the operating revenues and costs of the real estate investments ($r_A\tilde{A}$); (ii) net of the interest expenses ($r_D D$); (iii) the periodic management fee (in

terms of fixed compensation component); (iv) the valuation gains and losses from the periodic real estate valuations performed by the independent appraisers, including effective profits and losses from real estate disposals (Val&DispGainsLosses); (v) the other (minor) REIT operating costs and profits, including Other Profits Losses.

NAV-Based REITs

Turning to the compensation structure of NAV-based REITs, the calculation is analogous to the one of the GAV-based REITs but differ in respect to the reference basis which is net of the REIT liabilities. The calculation basis is equal to the total asset minus the amount of debt (D):

$$C_{NAV} = \sum_{t=0}^{n} \frac{m_{NAV} \times \left[\min\left(\widetilde{A}_t; A_{ACQ}\right) - D_t\right]}{(1+i)^t} + \frac{k \times NAV_0[(1+r)^n - (1+r^*)^n]}{(1+i)^n} \quad (5)$$

$$C_{NAV} = f[m_{NAV}; \left[\min\left(\widetilde{A}_t; A_{ACQ}\right) - D_t\right]; k; (r - r^*)] \quad (6)$$

The calculation basis of the fixed fee component is invariant to leverage and will be affected only by an increase in the net asset value:

$$\Delta(A - D) = f[\Delta NAV(E; rr; \text{Net Funds})] \quad (7)$$

$$E_t = r_A\widetilde{A}_t - r_D D_t - m_{NAV} \times \left[\min\left(\widetilde{A}_t; A_{ACQ}\right) - D_t\right] \pm \text{Val\&}DispGainLosses \pm OtherProfitsLosses \quad (8)$$

At first stage, therefore, an increase in the total asset financed via debt does not alter the managers' compensation because higher real estate investments counteracted by higher liabilities leave the net asset value unchanged. However, larger total assets might turn out, as illustrated next, in a higher operating income ($r_A\widetilde{A}_t$) net of the interest payments ($r_D D_t$) as long as the cost of debt, even if marginally increasing as a function of the leverage ratio, decides the operating return. Other things constant, from a pure accounting perspective, but not in financial terms considering the risk of leveraging, higher operating incomes net of the cost of debt will result in better net earnings (E). Higher net earnings affect NAV for the amount (rrE) not distributed to the shareholders which, in turn, marginally increases the calculation basis of the fixed management fee component also for NAV-based REITs, however for lower amounts in respect to GAV-based REITs.

The Variable Performance Fee of GAV and NAV-Based REITs

The over-performance fee can be viewed as a call option hold by the REIT managers (Jenkins, 1980). The option will be in the money as long as the overall yield of the REIT (r) is expected to beat the hurdle return (r^*) as the option strike price. The ladder should benchmark the expected risk profile of the REIT's real estate portfolio consistently with the investment policy reported in the REITs by-laws.

The overall compensation structure considering both the fixed and variable component can be depicted as follows in the following figure.

The fixed management fee ensures a basically constant compensation (although variable upon changes in the GAV and NAV reference values) that usually largely exceeds, as shown next and confirmed at empirical market level (Section 4), the variable component. This reduces the effective relevance of the overperformance fee also due to the fact that the variable remuneration is usually paid only at the end of the REIT's duration. As described in the following sections, the value of the call option embedded in the compensation structure is a function of the capital structure choices of the REIT managers. The following analysis will therefore largely focus on the fixed fee component.

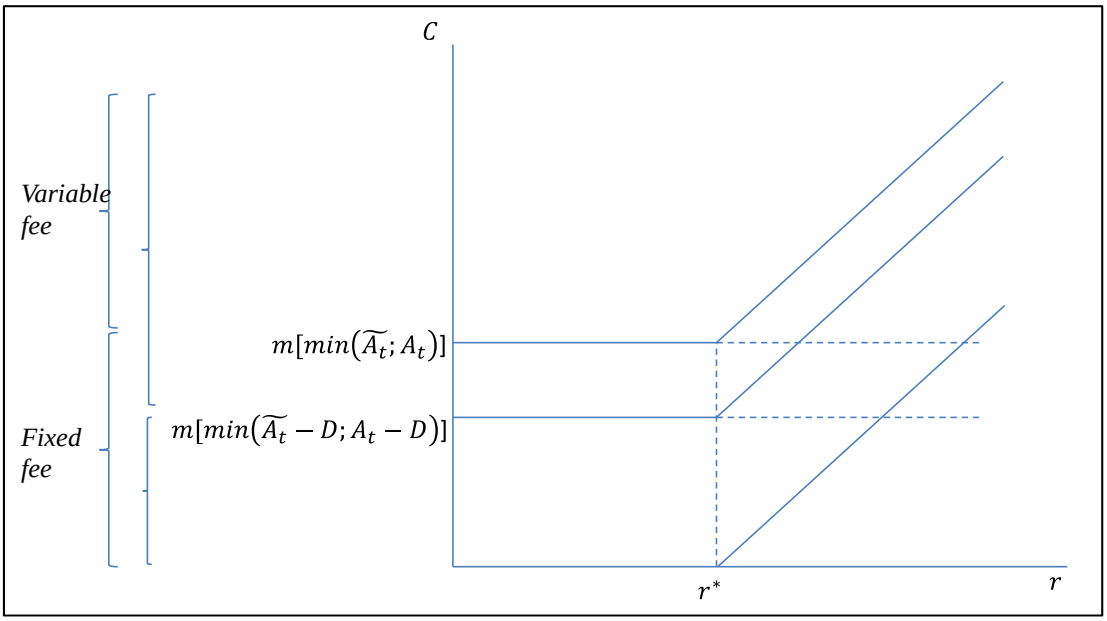

Figure 1. Overall compensation structure.

Literature Review and Theoretical Framework

The fee structure impacts the REIT managers' decisions both at investment and financial level when trying to maximize their compensation (Li, 2010). In turn, the investment decisions and capital structure choices of the managers clearly affect share value and performance of REITs (Capozza & Seguin, 2000)[7]. Moreover, the effect must be further differentiated in terms of possible share valuation perspectives, i.e. if REIT shares are valued following a net asset versus a (financial) market approach. The two dimensions lead to a price dichotomy, trading (European) REIT shares usually at discount in respect to their net asset value.

Keeping in mind that the ability of the REIT managers to execute higher fees might not coincide with the shareholders' interests if the management decisions do not turn out in a better REIT performance, as well (Pennathur & Shelor, 2002; Cannon & Vogt, 1995).

In that respect, the expected impact differs from GAV vs. NAV-based compensation schemes.

The Effects on Investment Decisions and Capital Structure for GAV and NAV-Based REITs

For GAV-based REITs, considering—as described above—largely invariant calculation fee rates, with the only exception of the reference basis for calculating the fixed fee component [please, consider the C_{GAV} expression in (2)], an increase in compensation requests a growth of the total assets[8]. In turn, total assets are influenced by the flow of new (real estate) investments and changes in the NAV [please, consider the ΔA expression in (3)].

Considering for public REITs (as the empirical data show for large part of European continental vehicles) the (severe) share market price discount on NAV and the regulatory constraint that obliges REIT managers to

[7] The analysis does not consider changes in real estate values due to market fluctuations. This is because the real estate market dynamic is exogenous to the fee structure and affects both GAV and NAV-based REITs.

[8] In addition, managers might pursue an increase in the expected REIT yield (r). This is by orienting the investment choices towards riskier real estate. However, such a management behavior should not be feasible in practice due to the fact that managers are requested to be compliant with the investment policies reported in the REIT by-laws, whose risk profile should be consistent with the target REIT return (r^*).

issue new shares at net asset value (and not at market price) as mandatory reference value, additional equity offerings are *de facto* unfeasible. REIT managers will therefore be incentivized to (rapidly) maximize leverage, eventually up to the admitted maximum regulatory burden[9], in order to increase—as a function of the management fee ratio—their compensation for every additional debt amount. The issue of debt would be invested for additional real estate investments which, in turn, would enhance the total assets (i.e. the reference basis for calculating the management fees).

In that context, a theoretical expectation, to be tested empirically, would be that GAV-based REIT managers might be less selective in the marginal investment selection in respect to fully equity funded investments which means that managers might engage also in real estate projects with negative net present value (NPV) and not only in investments with zero or positive NPV. This is in order to rapidly allocate the additional fund raised via the issuing of debt[10]. In fact, in the case of investment projects with negative NPV, the higher transaction price paid by the REIT in respect to the fair market value (which should lead to a zero NPV) should emerge in the subsequent financial statements of the REIT where the real estate investments are reported at their market values as assessed by independent appraisers. Real estate investments with negative NPV should therefore be reflected in valuation losses (Val&DispGainsLosses) that would reduce the net earnings. In turn, this would be detrimental to the net asset value and, consequently, at accounting level, to the total assets, negatively affecting the fee calculation basis. However, the benefit generated by a rapid total asset growth externally financed is expected to largely exceed the contrarian effect induced on net earnings by the potential valuation losses eventually engendered by negative NPV investment opportunities. In that hypothesis, to be tested empirically (Section 4), the managers' choices would be detrimental to the shareholders' interests.

At profit and loss level, debt recourse is expected to contribute positively to the net earnings because of the additional income generated by the marginal real estate investments as long as their operating return, net of the related fixed management fee induced by the total assets growth, exceeds the cost of debt, assumed to increase with leveraging: $r_A(A_{t+1} - A_t) - m_{NAV} \times \left[\min\left(\widetilde{A}_{t+1}; A_{ACQ_{t+1}}\right) - \min\left(\widetilde{A}_t; A_{ACQ_t}\right)\right] > r_D(D_{t+1} -$ Dt.

Please note that the progression of the management fee is invariant in respect to the real estate asset return and that its relative incidence increases proportional to the decrease of the differential $(r_A - r_D)$ due to the step-by-step rise in the cost of debt because of the enhanced leveraging. In turn, the expected increase (although at decreasing rates and as a function of the fee dynamic) of the net earnings will enhance, from an accounting perspective, the net assets for an amount equal to the retained net earnings (rr).

Leverage maximization positively affects also the variable management remuneration. As known, higher debt ratios amplify the volatility of the net earnings € and, therefore, of the REIT return (r). In turn, the enhanced volatility will increase the value of the call option embedded in the performance fee component by amplifying the probability that the REIT return exceeds the hurdle rate ($r > r^*$). The option would in that case be in the money.

Overall, the total asset increase via leverage is expected to positively affect both the fixed and variable fee component for GAV-based REITs.

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[9] The regulation in place until 2013 forced REITs to limit leverage up to 60% of the ratio between financial liabilities and real estate assets (Bank of Italy, 2005; 2007).

[10] The hypothesis tends to be capped, at least for Italian REITs, by the regulatory fee calculation provisions that imposes to calculate the compensation considering, for real estate, the minor between the their market value and acquisition cost.

NAV-based REIT managers are less incentivized to leverage due to the fact that debt does not affect in a direct way the management fee compensation basis. In fact, the foundation for calculating the fixed remuneration component is the net asset value only [please, consider the expressions in (6) and (7)]. An externally financed increase of the total assets is offset by a parallel increase of the debt with a null effect on net assets, at first stage. Management fees remain therefore unaffected by leverage.

Assuming the unfeasibility, due to the already reported reasons, of new equity offerings, an increase in the fee calculation basis relevant for NAV-based REITs necessarily and exclusively requests, other things constant, higher retained earnings (E; rr). In that respect, the capital structure decisions are not neutral and affect the profit and loss account in similar terms, from an accounting perspective, as for the GAV-based REITs described above. Additional debt financed real estate assets is expected to positively contribute to the REIT net earnings due to the marginal growth of the operating return net of the cost of the debt: $r_A(A_{t+1} - A_t) - m_{NAV} \times \{ [\min(\widetilde{A}_{t+1}; A_{ACQ_{t+1}}) - D_{t+1}] - [\min(\widetilde{A}_t; A_{ACQ_t}) - D_t] \} > r_D(D_{t+1} - D_t)$.

An increase of the net earnings will lead to a higher NAV, and therefore of the fee calculation basis, in the amount of equal to the retained net earnings (E; rr). Again, the expectation is of a limitation in the related pay-out ratio. However, NAV-based REIT manager will execute higher management fees only in the case of a positive earnings contribution of the marginal real estate investments financed via debt; higher fixed management fees are therefore always related to an increase of the net operating result of higher amount then the fee growth induced by the NAV enhancement originated by the reported increase of the net operating return.

Different from GAV-based REITs, NAV-based REITs are expected to be particularly severe in the investment selection because negative NPV investments would generate, given the assumptions above, valuation losses (Val&DispGainsLosses) of the real estate assets, which, in turn, would negatively affect the net earnings and therefore the net assets (NAV). This would reduce the management fee calculation basis. The real estate portfolio of NAV-based REITs should consequently be characterized, other things constant, by a higher gross real estate return relative to the real estate assets hold by the GAV-based REITs.

At the same time, given—at least for Italian REITs—the regulatory cap of the management fees with regard to the unrealized valuation gains, NAV-based REITs are expected to experience a higher trading intensity of the real estate portfolio in respect to GAV-based REITs in order to execute the embedded gains. The sale profits would enhance the fee calculation base for the retained amount.

Referring to the variable fee component, positive debt trends will generate similar effects on the implicit option value as for the GAV-based REITs as described above.

Overall, NAV-based REITs are also incentivized to issue debt in order to enhance the reference base for the fee calculation. However, the incentive is significantly minor, also in terms of trend slope, in respect to GAV-based REITs.

The Effects on Share Value and Performance for GAV and NAV-Based REITs

Following an accounting share valuation perspective (i.e. net asset based), at first stage the forecasted rapid increase in the debt ratio does not affect the NAV because the debt offsets the new real estate investments at accounting level. However, leveraging is expected to indirectly impact the net asset via the three major components (i.e. operating return; valuation gains and/or losses; management fee dynamic) described above that influence the retained earnings (recalling that without share reimbursements and/or issues $NAV_{t+1} = NAV_t + E_{t+1} \times rr$, where $NAV_{t+1} > NAV_t$):

(1) the first factor refers to the forecasted increase of the operating profits net of the cost of the debt due to the marginal operating earnings generated by the additional investments; the expected contribution is expected positive but at decreasing rate as a function of the higher REIT leverage;

(2) the second component, of critical sign, refers to the quality of the additional REIT investments as proxied by their (positive, zero or negative) NPV;

(3) the third (negative) factor is described by the increase of the fixed management fees as a consequence of the total assets' growth externally financed. Different from the net operating income, which increases at decreasing rates, the growth of the managers compensation is basically linear and function of the management fee ratio m_{GAV}. Therefore, the higher management fee will tend to absorb part of the net operating income growth ($r_A A - r_D D$), especially for high leverage ratios.

The net effects are overall uncertain and will be tested empirically in Section 4, but undermining a potential dichotomy between the interests of the managers and of the shareholders due to the fact that the expected management fee growth not necessarily also leads to a parallel investors' benefit.

Following a financial valuation perspective, the effects on (public) share prices of leveraging are uncertain and depend on which capital structure theory best explains the peculiar institutional and regulatory framework of (European) REITs generally characterized, below other, by a corporate tax free context ((Biasin, Giacomini, & Quaranta, 2010; Feng, Ghosh, & Sirmans, 2007).

If classical trade-off theory applies, any significant debt level would have no positive effect on the value of the REIT in a tax-free environment (Modigliani & Miller, 1958; Maris & Elayan, 1990) nor would it eventually negatively influence share value considering the probability of financial distress associated with leveraging. The theory assumes the circumstance of zero-NPV investments. Second, however, considering the nature of REITs' assets (that can easily be used as collateral), agency relations and bankruptcy costs, REITs may be expected to issue debt (Titman & Wessels, 1988), at least for certain amounts, seeking a balance between management incentive and distress costs. In addition, a certain debt level may also provide the discipline for the REIT's directors to manage effectively and efficiently, overcoming the embedded agency issues, thus positively influencing net cash-flows (Bradley, Capozza, & Seguin, 1998). Relative low levels of debt are therefore expected to potentially lower the weighted average cost of capital over the short run and therefore increase the value of the REIT as compared to a suboptimal (all-equity) capital structure (Capozza et al., 2000). Beyond some threshold level of debt, the positive effects might however be counteracted by the potential costs of financial distress that rise as the level of debt increases. This might lead to a share value decrease (Howe & Shilling, 1988).

Again, the impact on share (public) market prices of the capital structure decisions induced by the GAV-based compensation structure is questionable and requests to be tested empirically.

Large part of the indications reported for GAV-based REITs hold also for the NAV-based REITs but with some relevant differences in respect to the accounting valuation perspective.

In fact, as described above, differentl from GAV-based REITs (whose management fees are linked to the total assets' growth and whose leverage progressively erodes the operating income net of the cost of debt), for NAV-based REITs the impact of the marginal real estate investments externally financed are expected to impact always positively on the net earnings and, in turn, on the net asset value. Moreover, the incentive to select only investment opportunities with zero or positive NPV should limit the probability of valuation losses and favor the emersion of the latent valuation profits.

As it can be noted, the management fee dynamic is always inferior to the expected return difference between assets and liabilities, while the effect of the asset valuation is forecasted as positive or neutral. Overall, the impact on the net asset value of increasing leverage ratios should therefore be positive for NAV-based REITs. An increase of the management fees should therefore always be aligned with the shareholders' interests in terms of share value increase.

Finally, with regard to the market price impact of NAV-based compensation structures, the same considerations as for GAV-based REITs apply. However, there is an important difference: the expected positive correlation between leverage and net earnings should generate, in relative terms, higher income flows for NAV-based REITs in respect to GAV-based REITs, given, for both REIT types, a higher net earnings volatility because of the use of debt.

GAV vs. NAV-Based REITs: A Summary

Overall, the theoretical analysis of the effects on REIT share value and performance of the different compensation structures (i.e. GAV *vs.* NAV) suggests that:

(Hypothesis 1) In terms of capital structure decisions, all REITs should experience a positive debt trend. However, the leverage trend slope is expected to be significantly higher for GAV-based REITs in respect to NAV-based.

(Hypothesis 2) Over time and as a function of the fee rate *m*, the fixed management compensation of GAV-based REITs should exceed the one of NAV-based REITs. This circumstance should also lead to lower real estate asset returns net of the management fees for GAV-based REITs because their managers' compensation is projected to increase at linear rates while the fees of NAV-based REITs are expected to decline per unit of assets under management.

(Hypothesis 3) NAV-based REITs are projected to be more discriminating, relative to GAV-based REITs, in the investment selection by accepting only investment opportunities with zero or positive NPV, while GAV-based REITs might also engage in negative NPV projects. NAV-based REITs should also be characterized by a higher trading intensity of their real estate portfolio in order to monetize the latent valuation gains. This investment policy should turn out in higher real estate investment returns gross of the management fees for NAV-based REITs in respect to GAV-based REITs. In particular, both the growth and the current gross return of the NAV-based REITs should exceed the corresponding return of the GAV-based REITs. Similarly, due to the higher forecasted incidence of the management fees, the net yield (i.e. net of the managers' compensation) of the NAV-based REITs should therefore beat the net return of the GAV-based REITs.

(Hypothesis 4) The effects on share value of the capital structure decisions of the REIT managers largely depend on the adopted valuation perspective. If shares are valued following an accounting approach (i.e. upon net asset value), the impact is expected to be positive for NAV-based REITs, while the effects are controversial for GAV-based REITs, even though the overall expectation might also be positive but a decreasing rates. If shares are valued following a financial approach (i.e. upon market prices), which considers the financial risk implied in the use of debt, the impact of leverage is uncertain for both compensation structures. The effects depend on the financial theory that best fits the institutional and operating context of REITs. In any case, as already reported, the relative difference in compensation executed by GAV vs. NAV-based REIT managers clearly largely depends on the fee ratio that applies to the calculation base given the forecasted capital structure

and related leverage. In that respect, the market evidence (Table 1) shows that the average management fee ratio of GAV-based REITs is surprisingly close to the one of NAV-based REITs.

(Hypothesis 5) Overall, given the theoretical framework and the market evidence in terms of average fee ratios, NAV-based REITs are expected—other things equal—to outperform GAV-based REITs which should therefore trade at discount in respect to the former.

Research Methods, Results, and Analysis

The empirical investigation of the above hypothesis is based on the data of the entire Italian public REIT population. At the end of June 2012 in this group there were 25 all-equity retail REITs. More information about all REITs considered in the analysis is reported in Table 2.

Table 2

All-Equity Public Retail REITs Considered in the Analysis

		NAV Obs. as of June 2012	Listing date	Maturity date
Atlantic 1	GAV	13	7-Jun-06	2013
Atlantic 2 (Ex Berenice)	GAV	14	19-Jul-05	2012
Bnl Portfolio Immobiliare	GAV	25	2-Jan-02	2010
Caravaggio	GAV	14	16-May-05	2012
Estense Grande Distribuzione	GAV	19	3-Aug-04	2013
Obelisco	GAV	14	14-Jun-06	2015
Olinda	GAV	16	9-Dec-04	2011
Portfolio Immobiliare Crescita	GAV	15	1-Jul-03	2008
Tecla	GAV	17	4-Mar-04	2011
Europa Immobiliare 1	GAV	16	4-Dec-06	2014
Alpha	NAV	23	4-Jul-02	2016
Beta	NAV	17	24-Oct-05	2012
Immobilium 2001	NAV	20	29-Oct-03	2017
Invest Real Security	NAV	18	24-Jan-05	2013
Investieco	NAV	20	1-Nov-04	2012
Amundi Re Europa (Ex Caam Europa)	NAV	22	17-Nov-03	2016
AMUNDI RE ITALIA (Ex Caam Italia)	NAV	23	3-Jun-02	2016
Piramide Globale	NAV	25	26-Nov-02	2015
Polis	NAV	25	20-Apr-01	2012
Securfondo	NAV	26	5-Feb-01	2014
Unicredito Immobiliare Uno	NAV	26	4-Jun-01	2014
Valore Immobiliare Globale	NAV	27	29-Nov-99	2014
Immobiliare Dinamico	NAV	15	3-May-11	2020
Risparmio Immobiliare Uno Energia	GAV	12	7-Aug-09	2018
Delta Immobiliare	NAV	12	12-Mar-09	2014
Mediolanum Real Estate A	GAV	13	1-Oct-12	2021
Mediolanum Real Estate B	GAV	13	1-Oct-12	2021
Socrate	NAV	0	30-Jan-14	2017

Source: Assogestioni, Italian (London) stock exchange and authors' adjustments.

Because of their diverse listing and maturity dates, the analysis (starting from November 1999 and ending in June 2012) does not always include all the REITs at the same time. More in detail, the whole data set was used to perform a debt trend and a correlation analysis as well as to construct the price index described in the

last part of this Section. Indeed, as far as the construction of the periodic (semi-annual) averages of the financial ratios in the analysis is concerned, only the data from June 30, 2006 to June 30, 2012 were taken into consideration because in that period the entire REITs' population was listed. In relation to the different kinds of analyses, daily market prices or semi-annual balance sheet and income statement values[11] were used.

The data set construction of the relevant accounting figures employed in the analyses required particular care, both in collecting the quali-quantitative information from different available data banks and, later, in estimating the missing values via data interpolation of the available information. More in detail:

(i) the values of the balance sheet and income statement variables (i.e. debt, NAV, GAV, management fees, operating revenues, valuation gains/losses, disposal gains/losses, dividends values) used in: the debt trend analysis; the correlation analysis; the computation of the financial ratios' periodic averages; the price index construction, were manually extracted from the semi-annual reports.

(ii) some qualitative information, like the REIT investment policy, was obtained from the REITs articles of association also filed to the Vigilance Authority.

The obtained data set, combining such diverse information unavailable at the same time within other sources, is actually an original and a more complete and useful data bank for the analysis of the research topics. Moreover, it allows a direct comparison of the REITs behaviour, dynamics, and performances.

Unfortunately, it was not possible to obtain a REITs' sub-classification by property sectors due to the relatively limited number of REITs and the high concentration in terms of property sectors (office/commercial) and asset location (Rome and Milan).

The empirical investigation of the theoretical hypothesis on managers' behaviour starts with a debt analysis (Hypothesis 1).

As a first step, the debt to asset ratio of each REIT was calculated. With the aim of giving the same explanation capability to the obtained values during the following data processing, the values reached over time by this ratio were normalized taking into account the leverage limitations in place (i.e. a debt to asset ratio $\leq$ 60%).

Each time, overall, GAV-based REITs showed a higher average leverage level than NAV-based ones. In other words, GAV-based REITs used a higher leverage percentage compared to the maximum allowed threshold than NAV-based REITs[12].

The analysis also focused on the REITs' tendency to leverage via a regression approach (Hamilton, 1994; Greene, 2012). In that respect, theory suggests that a positive debt trend for all REITs should be observed even though the slope entity should be higher for GAV-based REITs than for NAV-based. In particular, the faster leverage dynamic of GAV-based REITs should be due to the fact that they are expected to be less selective in investment decisions. Considering time to be a key variable, the maturity of each REIT was divided into three stages depicted below: an "initial" stage, i.e. a period of about 3.5 years, a "mature" stage, and a "liquidation" stage that starts three years before final maturity.

In this context, the previous theoretical intuition should be evident for the overall period, the initial stage (in particular) and the mature stage. In other words, the debt trend slopes of the GAV-based REITs should be higher than those of the NAV-based REITs overall and both at the initial and mature stages.

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[11] The authors thank the Italian (London) Stock Exchange and Assogestioni for the data provided.

[12] Data are available upon request.

Independent from the time interval considered (i.e. the whole maturity; the first 3.5 years (initial stage); the period from the 8th semester to the semester ending before the last three years (mature stage) of the REITs' life), the regressions implemented to search for the debt trend shape used the debt to asset ratio normalized as described before as dependent variable. The econometric analysis showed that a linear regression model without intercepts obtains the best fits[13]. The econometric considerations made regarding the best fit allow us to confirm the absence of relevant omitted variables, here defined as omitted values due to a possible different model specification, strengthening the meaning of the (statistically significant) corrected R^2 values that are particularly high.

The obtained debt trend slopes (b_i, where $i = 1, \ldots, n$ indicates the different REITs) are coherent with the theoretical expectations and show that[14]:

(i) the trend slopes are all positive values.

(ii) the overall trend slopes of GAV-based REITs are individually and on average (mean = 0.1688) higher than those of NAV-based REITs (mean = 0.0687)[15].

(iii) the initial stage trend slopes of GAV-based REITs are individually and on average (mean = 0.2949) higher than those of NAV-based REITs (mean = 0.0906)[16].

(iv) the maturity stage trend slopes of GAV-based REITs are individually and on average (mean = 0.1303) higher than those of NAV-based REITs (mean = 0.05778)[17].

(v) individually, the initial stage trend slopes are higher than both those of the overall trend and those of the mature stage trend (i.e. $b_{i\,\text{initial stage}} > b_{i\,\text{overall}} > b_{i\,\text{mature stage}}$)[18], confirming that in the mature stage the leverage demand decreases. Actually, this phenomenon is less evident for NAV-based REITs because of their already very low slope values both for the overall and initial debt trends.

Furthermore, in order to test Hypothesis 2 and 3, the periodic (semi-annual) averages—separately for GAV and NAV-based REITs—were calculated: of the overall real estate asset returns gross of management fees (also unbundling for the current return—i.e. income yield—and the capital gain return—i.e. appreciation yield) and of the overall real estate assets returns net of management fees.

In the period from June 2006 to June 2012, i.e. when the entire REITs population was listed, NAV-based REITs overperformed at operating level relative to GAV-based REITs that enjoy lower total gross returns (i.e.

[13] In particular, the tests indicated that the linear without intercepts model had a better specification than: an exponential or a linear with intercepts model or a model that considers the log leverage value as dependent variable. The data and the obtained results are available upon request.

[14] Data are available upon request.

[15] Caravaggio, Portfolio Immobiliare Crescita and Piramide Globale left the market at different dates of the considered period. So, as for all other REITs, their overall, initial, and mature debt trend, even though taking into account their particular time window, refer to the period in which they were actually in the market. More in detail, for these REITs the actual market period starts from their listing date—independently from the fact of being listed or not at that date—and ends on the delisting date while for all other not delisted REITs the actual period in the market starts from their admission date—independently if they were listed or not at that date—and ends on June 30, 2012. On the other hand, when REITs entered the market at different dates in the considered period, the data to specify their overall and initial stage debt trend starts from their actual admission date, also if they were not listed at that date, and ends on June 30, 2012 or, data allowing, after seven semesters respectively in relation to the overall or the initial stage debt trend.

[16] Polis and Valore Immobiliare Globale did not use debt in the first seven semesters of their life thus showing a debt trend slope equal to zero. Risparmio Immobiliare Uno Energia, because of the available data, shows an initial stage debt trend identical to the overall debt trend.

[17] Because of their admission and maturity date, it was not possible to analyze the Risparmio Immobiliare Uno Energia, Mediolanum and Immobiliare Dinamico mature stage debt trend.

[18] Note that the previous inequality is not verified only for Investieco, Caam Re Europa, Unicredito Immobiliare and Socrate at least in relation to $b_{i\,\text{initial stage}} > b_{i\,\text{overall}}$.

gross of management fees) of the real estate portfolio in respect to NAV-based REITs (2.30% vs. 2.06%). This is both for the current yield component (2.53% for NAV-based REITs vs. 2.37% for GAV-based REITs) and the capital gains (-0.23% vs.—0.31%)[19]. The assumption that NAV-based REITs should be more selective in the investment decisions seems to be empirically supported.

Moreover, total real estate returns net of management fees, which is the relevant indicator for shareholders, are significantly higher for NAV-based REITs than for GAV-based REITs (that is NAV-based REITs net returns are, on average, ca. 14% higher than those of GAV-based REITs).

Hypothesis 4 was tested via a separate correlation analysis between each REIT debt level and share values obtained ex market prices or ex net asset values (Wooldridge, 2003). The analysis was performed both for GAV and NAV-based REITs in order to check the leverage effects on REIT share value considering the two valuation perspectives. The debt level was quantified in terms of the debt to asset ratio normalized according to the maximum level admitted by the regulatory provisions in place.

The obtained results show that[20]:

(i) both for GAV and NAV-based REITs leverage positively affects the share value calculated ex net asset. The correlation between debt and share value ex net asset is, in fact, on average about 9% both for GAV and NAV-based REITs with a low value of the variability index on the maximum (respectively about 7.5% and 6.7%);

(ii) both for GAV and NAV-based REITs leverage negatively affects the share value calculated ex market price. The correlation between debt and share value ex market price is, in fact, on average about -14% for GAV-based REITs and about -19% for NAV-based REITs with a low value of the variability index on the maximum (respectively about 6.1% and 5.9%).

In relation to Hypothesis 5, suggesting that overall NAV-based REITs, other things equal, should generate higher returns in respect to GAV-based ones, a value-weighted price index (Haugen & Baker, 1991; Jr. Boxwell, 1994; Arnott, Hsu, & Moore, 2005; Hsu, 2006; Amenc, Goltz, & Le Sourd, 2006), separately for GAV and NAV-based REITs, was constructed, taking into account the dual price level that characterizes REITs (i.e. ex share market price or ex net asset). The obtained values of the price index in these four cases are actually the values of a performance index and can be used to verify if the GAV-based REITs truly show overall lower returns over time than NAV-based REITs and this is both from a market price and ex a net asset valuation perspective.

As it is well known, in relation to the construction of a value-weighted price index, an index maintenance is required to assure its coherence that can be obtained by solving the problem of index discontinuity due to assets entering/exiting the market over time (Chance, 1966; Broby, 2007; Fernholz, 1998).

For our purposes, after a k REIT group entry at time *t*, it is possible to realign the price index as follows:

$$B'^{n+k}_{(t+1)} = B^{n+k}_{(t+1)} \frac{B^{n}_{(t)}}{B^{n+k}_{(t)}} \tag{9}$$

where, $B'^{n+k}_{(t+1)}$ is the adjusted index value at time $(t+1)$ after the k REIT group entry at time t, $B^{n+k}_{(t+1)}$ is the still unadjusted index referred to the $(k+n)$ REITs in the market at time $(t+1)$, $B^{n}_{(t)}$ is the index value at time t calculated on the original n REITs and $B^{n+k}_{(t)}$ is the index value obtainable at time t taking into account the k REIT group too.

[19] Data are available upon request.
[20] Data are available upon request.

With the aim of quantifying $B_{(t)}^{n+k}$, the REIT price estimation at the index starting date can be effectively obtained by rectifying the market global capitalization to the date of reference taking into account the weights of the assets within the price index construction too.

In more detail, it is possible to realign the price index after a k REIT group entry in the market as follows:

$$B_{(s)}^{'n+k} = \sum_{i=1}^{n+k} \frac{p_{i,(s)}}{p_{i,(t)}} \cdot w_{i,(t)} \cdot R_1 \tag{10}$$

$$R_1 = \frac{\sum_{i=1}^{n} \frac{p_{I,(t)}}{p_{I,(0)}} \cdot w_{I,(0)}}{\sum_{i=1}^{n+k} \frac{p_{I,(t)}}{p_{I,(t)}} \cdot w_{I,(t)}} \tag{11}$$

where $s = t, t+1, \dots, T$, p_i are the REITs ($i = 1, \dots, n, \dots, n+k$) prices (ex market value or ex net asset) and $w_{i,(0)}$ and $w_{i,(t)}$ are weights[21] of the REITs respectively at time 0—i.e. the index starting date—and t. Note that the R_1 denominator is equal to 100.

The coefficient R_1 rectifies the price index from t by homogenizing the index values computed before and after t. Within the price index calculation R_1 does not change until other REITs enter the market.

As usual, it is possible to realign a price index after a delisting as follows:

$$B_{(t+1)}^{'n-k} = B_{(t+1)}^{n-k} \frac{B_{(t)}^{n}}{B_{(t)}^{n-k}} \tag{12}$$

where $B_{(t+1)}^{'n-k}$ is the adjusted index value at time $(t+1)$ after the k REITs delisting, $B_{(t+1)}^{n-k}$ is the still unadjusted index referring to the $(n-k)$ REITs in the market at time $(t+1)$, $B_{(t)}^{n}$ is the index value calculated on the original n REITs at time t and $B_{(t)}^{n-k}$ is the price index value at time t that considers only $(n-k)$ REITs in the market.

More in detail, it is possible to realign the price index after a delisting as follows:

$$B_{(t+1)}^{'n-k} = \sum_{i=1}^{n-k} \frac{p_{i,(t+1)}}{p_{i,(0)}} \cdot w_{i,(t+1)} \cdot R_2 \tag{13}$$

$$R_2 = \frac{\sum_{i=1}^{n} \frac{p_{i,(t)}}{p_{i,(0)}} \cdot w_{i,(0)}}{\sum_{i=1}^{n-k} \frac{p_{i,(t)}}{p_{i,(0)}} \cdot w'_{i,(0)}} \tag{14}$$

where $i = 1, \dots, n-k, \dots, n$. The weights $w_{i,(0)}$ are lower than $w'_{i,(0)}$ because the weights $w'_{i,(0)}$ are calculated considering $(n-k)$—in place of n—REITs in the market.

The coefficient R_2 rectifies the price index from t by homogenizing the index values computed before and after t. Within the price index computation R_2 does not change until other REITs' delisting[22]. The date of

[21] Within the price index computation the used weights were obtained in the following ways: (i) in the case of share values based on market price, the market price was multiplied for each REIT by the number of its traded share. The obtained amount was then divided by the sum of the same amounts referred to all REITs; (ii) in the case of share values based on net asset, the net asset value of each REIT was divided by the sum of the net asset values of all REITs.

[22] As already mentioned, in the considered period Caravaggio, Portfolio Immobiliare Crescita and Piramide Globale exited the market.

December 31, 2001 was chosen as the starting date of our price index because it was the first point of time at least one REIT of each type was simultaneously listed in all four cases (i.e. at least a NAV or a GAV-based REIT considering both market price and net asset share values). The values obtained were then shifted to December 31, 2002 since it is a date close to the initial one (December 31, 2001). This is also allowed to directly compare the values obtained by the price indexes with those of comparable indexes (i.e. REIM)[23] whose values started from the same reference date. The comparison showed a dynamic of the obtained values that, despite the differences in the four situations, it is always broadly consistent with the information provided by the REIM index[24].

Figures 2 and 3 report the values of the performance index (in terms of overall returns) for the four considered cases. The values confirm the theoretical expectations of NAV-based REITs outperforming GAV-based REITs by experiencing higher returns at investor level.

The difference in the overall REIT return however is necessarily a function of the actual rate of the management fee. As underlined in the first part of this contribution, the fixed (and variable) fee rates on average do not show substantial differences between the two REIT categories.

The best performance in terms of total return achieved by NAV-based REITs is confirmed both in relation to market prices and net asset share values. This evidence is particularly significant for the performance index values quantified on market prices. It is also consistent with the results of the correlation analysis in terms of a share value depreciation resulting from leveraging.

In terms of overall REIT performance, the choice of which compensation structure best fits to the shareholders' interests seems a discriminating factor that requires the management fee rate to be calibrated *ex ante* in respect to the target REIT's capital structure.

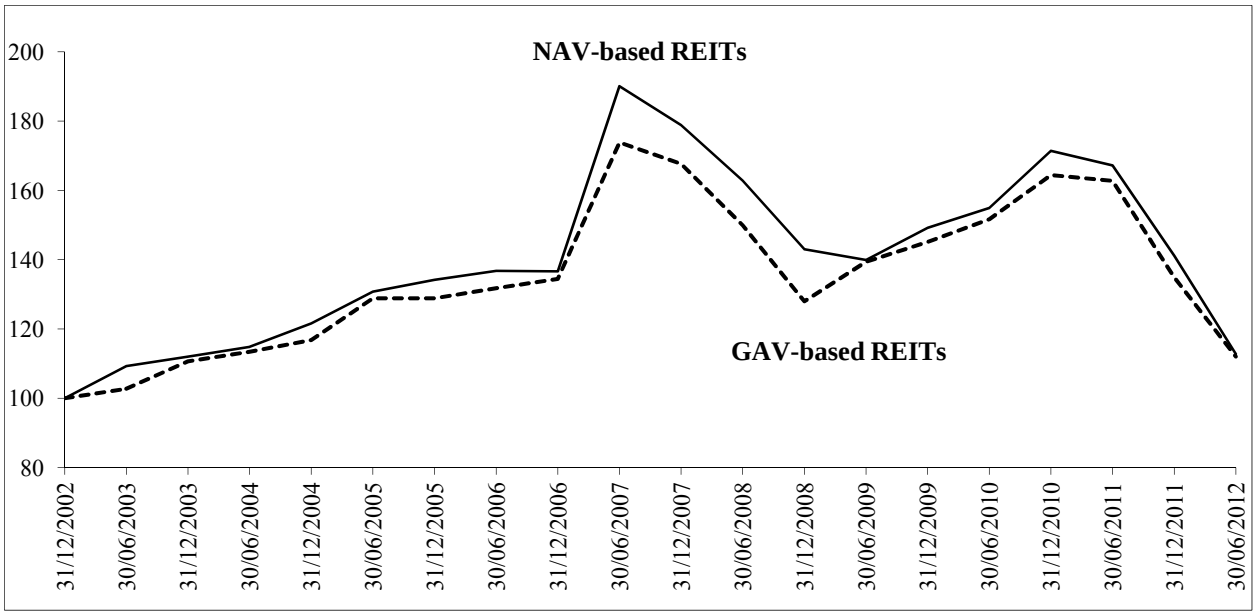

Figure 2. Performance index of NAV and GAV-based REITs upon share net asset value (reference period December 31, 2002-June 30, 2012. 100 = December 31, 2002)

[23] BNP Paribas REIM Index. Source: www.reim.bnpparibas.it.
[24] Data and obtained results are available upon request.

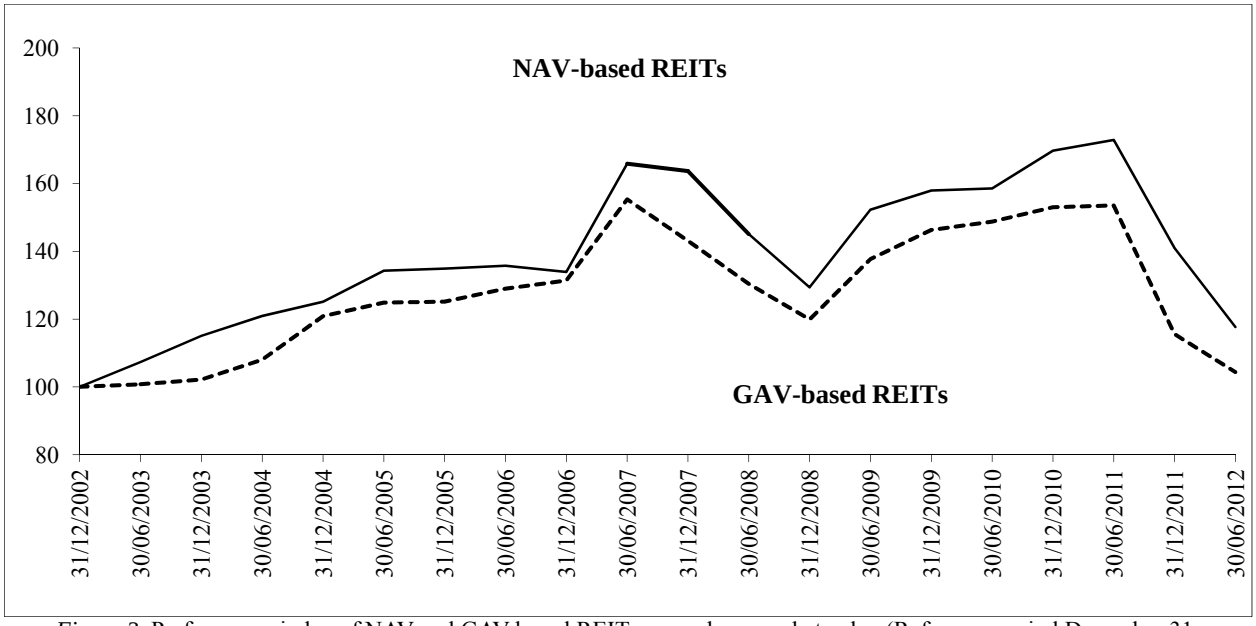

Figure 3. Performance index of NAV and GAV-based REITs upon share market value (Reference period December 31, 2002-June 30, 2012. 100 = December 31, 2002).

Conclusions

Investors should always argue about management fees because of their impact on net performance that can be substantially. This especially for investments, like real estate, hedge funds and private equity vehicles, which require intensive management and allow the use of debt.

Because of leverage, different from traditional mutual funds, REIT managers can be rewarded in terms of a fixed payment based alternatively on gross asset value or net asset value. In addition, managers usually also gain a performance fee when the REIT's total return exceeds some minimum level.

Financial literature, largely focusing on the overall agency problems in REITs' governance, devotes limited attention to this particular fee issue that, conversely, might influence in a relevant way the investment performance net of management fees. This also considers the relevance of REITs' global market capitalization. The paper, considering the institutional and market framework of scope, aims to fill in this gap by exploring how the GAV vs. NAV-based compensation influences the investment and capital structure decision of managers and, in turn, the share value and performance of REITs.

The theoretical hypothesis is that the different calculation base (NAV or GAV) used to compute the fixed management fee incentivizes managers to leverage in order to enhance their compensation. The incentive seems maximum for GAV-based REITs, for which the management fees increase linearly for any increase in total assets financed via debt. Differently, NAV-based REITs are projected to be less incentivized to issue debt due to the fact that leverage does not affect, at first stage, the reference fee calculation basis. At second stage, debt influences positively the REIT net earnings via enhanced net operating returns at accounting level.

Given the fixed management fee rate, the compensation of GAV-based REITs is expected to exceed, in terms of fee per unit of asset under management, the corresponding remuneration of NAV-based REITs. The relevant, immediate impact of debt on the management fees of GAV-based REITs suggests positive leverage trends. At the same time GAV-based REITs are expected to be less selective in the investment decisions

relative to NAV-based REITs where potential valuation losses on the real estate portfolio would reduce the calculation base of the management fee.

GAV-based REITs should therefore experience, other things equal and relative to NAV-based REITs, a higher incidence of the overall management compensation and a lower return of the managed real estate portfolio; this both gross and net of the management fees.

The effects of the investment and capital structure decision on REIT share value and performance depend on the adopted valuation perspective, i.e. if shares are valued considering market prices (financial approach) or net asset values (asset-based approach).

The empirical analysis confirms the theoretical expectations that the compensation structure significantly influences the REIT managers' decisions both in terms of investment choices and financing decisions. GAV-based REITs are characterized by positive debt trends slopes that are significantly higher relative to NAV-based REITs which seem to be more careful in leveraging. This is both at initial, maturity, and overall stage measured upon maturity.

In the period from June 2006 to June 2012, i.e. when the entire REITs population was listed, NAV-based REITs overperformed at operating level relative to GAV-based REITs that enjoy lower total gross returns (i.e. gross of management fees) of the real estate portfolio in respect to NAV-based REITs. This is both for the current yield component and the capital gains. The assumption that NAV-based REITs should be more selective in the investment decisions seems to be empirically supported.

Moreover, total real estate returns net of management fees, which is the relevant indicator for shareholders, are significantly higher for NAV-based REITs than for GAV-based REITs.

In respect to the effects of investment and capital structure decisions, induced by the compensation structure, on share value, the empirical analysis shows a zero or slightly positive correlation between share value and debt both for NAV-based and GAV-based REITs if share value is measured from an asset-based perspective, i.e. in terms of net asset value.

Following a financial valuation perspective, REIT (public) market prices seem to be negatively correlated to debt both for NAV-based and GAV-based REITs. In that sense, pursuing higher compensations via leveraging does not turn out in a parallel benefit also for the shareholders.

Overall, given the above evidence, the theoretical framework suggests that NAV-based REITs should outperform GAV-based REITs, at least over the long run.

In that respect, the construction of return indexes separately for the population of GAV and NAV-based REITs shows that NAV-based REITs effectively outperform GAV-based REITs both at market price level (i.e. measuring return considering public market prices) and at NAV level (i.e. measuring performance upon share net asset value).

This evidence is of knowledgeable relevance for market participants, and (retail) investors in particular, because it enables rational decisions in respect to executive compensation acting as a disciplining divide.

It induces REIT investors to strengthen their corporate governance and, in turn, to discipline managers at various stages. By avoiding investing in REITs having inferior fee structures, at least in relative terms, by encouraging rational financial service firms, often acting as REIT managers, to adapt management fee structure to the investors' best interests and to provide, in perspective terms, compliant investment vehicles that would otherwise be avoided by knowledgeable investors (this is also in order to protect their market reputation and marginalize other non-adaptive market participants).

In operating terms, this evidence suggests the need to define the compensation base and the fee rate in accordance to the real estate investment objectives and target leverage ratios at initial stage (i.e. at REIT's constitution). This is in order to ensure an alignment of interests between REIT managers and shareholders.

The analysis focused on the market experience of the Italian public REITs and related institutional framework, largely common to other European experiences. However, given the fact that sensitivity to context and embedded observations are always critical, future research should be devoted to verifying how the theoretical effects might vary over time or their sensitivity to the institutional context because no single fee structure can be optimal in all circumstances.

As such the analysis did not aim to identify the best compensation scheme neither in absolute nor in relative terms (i.e. in respect to all potential fee alternatives) but simply to explore differences in respect to the specific but widespread executive compensation market practice (i.e. GAV vs. NAV) and provide some related corporate governance indications.

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