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Agency Cost, Dividend Policy and Growth: The Special Case of REITs

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Abstract Dividend distribution enhances information transmission, and mitigates agency conflicts by restricting managers' access to free cash flow, and exposing firms to the scrutiny and monitoring by market participants when raising external capital. The reduction in agency costs and improvement in information dissemination reduce the cost of funds, and investment at more competitive cost of capital enhances firm value. For REITs, because of the mandated high dividend distribution, growth depends on the availability of external capital at competitive rates, such that mitigation of agency costs is critical to sustain growth. We examine the relation between dividends and growth with a sample of U.S. equity REITs. Our data reveal a significantly positive relation between externally financed growth and dividend payments. The relation is stronger among REITs with more growth opportunities, and REITs that issue new equity and debt. We interpret this evidence as consistent with the notion that by reducing agency costs and facilitating capital raising, dividends enhance growth.

Keywords Dividend policy · Growth · Agency cost · Cost of funds · REITs

Introduction

To sustain growth, firms with insufficient internal funds must resort to external sources of capital. The cost of external capital depends on investors' confidence in how efficiently management will use the funds. Investors' confidence and trust in

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management derives from information dissemination between shareholders and managers, and the mechanisms that are in place to prevent management from wasting funds on unprofitable projects and enhancement of their personal benefits. The lower the information asymmetry between investors and managers, and the lower the agency conflicts, the more competitive is the cost of capital and the higher is the rate of growth. Extant evidence is generally consistent with this proposition. Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006) show that legal environment and mechanisms such as disclosure policy mitigate distortions due to information asymmetry and agency costs and help firms to access low cost external capital for growth.

We test this hypothesis with Real Estate Investment Trusts (REITs). The focus on REITs is motivated by the unique regulatory environment REITs operate in. To maintain tax-exempt status, REITs must pay out 90 % of taxable income as dividends. Consequently, internal funds are insufficient for REITs to support all investment initiatives (Ott et al. (2005)). The impact of information asymmetry and agency costs on cost of funds is more critical for firms that are more dependent on external capital for growth. As Khurana et al. (2006) observe, "a firm with limited internal funds relative to its investment opportunities will benefit from an expanded disclosure policy if more disclosure improves the firm's ability to pursue potentially profitable projects by providing access to lower cost external financing."

Additional inspiration for testing the link between growth and agency costs with REITs draws from a series of recent studies that have explored the link between REITs' dividend policy and firm value. Two studies are particularly relevant in this context. In an important paper, Hardin and Hill (2008) argue that to study dividend policy in REITs, it is appropriate to focus on *excess* dividends–the amount by which actual dividends exceed the mandatory level. It is intuitive that what investors are more concerned about is not the total or mandatory level of dividends, but the discretionary level of dividends that reflects managerial policy. Hardin and Hill (2008) model excess dividends as a function of proxies for agency conflicts between shareholders and managers, while controlling for firm-specific financial variables. The authors conclude that REIT managers' choice of the level of excess dividends is predicated on reduction of agency costs, and attribute the decision to the need for access to capital markets to raise funds for investment at favorable rates. It follows that by reducing agency conflicts and facilitating capital raising, dividends enhance growth. Indeed, Hardin and Hill (2008) find weak relation between excess dividends and Tobin's Q, which corroborates the notion that excess dividends are conducive to growth.

Chou et al. (2013) extend the Hardin and Hill (2008) perspective to provide additional evidence on the impact of excess dividends on the value of REITs. They model firm value as a function of excess dividends to conclude that excess dividends enhance value when the REIT structure is prone to higher agency costs, and when the board is dominated by insiders. This evidence further validates the notion that dividend distribution mitigates agency costs, and complements disclosure policies to affect market's assessment of firm value.

The studies by Hardin and Hill (2008) and Chou et al. (2013) constitute significant contributions to the growing literature on the impact of excess dividends on REIT operation and value. These authors present compelling evidence that excess dividends reduce agency costs and enhance firm value. However, although Hardin and Hill (2008) interpret the evidence of the positive relation between excess dividends

and Tobin's Q as an indication that firms are "willing to pay excess dividends to garner continued access to the capital markets required of a growth strategy", to our knowledge, direct evidence that the gain in value induced by excess dividends is achieved indeed through greater growth remains elusive. Agency theory predicts that when investors trust that managers are less likely to waste cash flow on their personal benefits of control, they are willing to supply capital at favorable rates. Jensen (1986) and Easterbrook (1984) discuss how dividend distribution reduces agency conflicts. First, dividend payments reduce free cash flow at managers' disposal. Second, dividend distribution forces managers to access the capital market more frequently to raise funds for investment, which subjects the firm to periodic scrutiny by institutions and analysts. As Khurana et al. (2006) argue, the reduction in agency costs and improvement in information dissemination reduce the cost of funds, and investment at more competitive cost of capital increases firm value. In accordance with this theory, we investigate two issues: (1) is payment of excess dividends conducive to higher growth? (2) do excess dividends induce lower cost of capital? Evidence on these issues constitutes an important contribution to the literature on excess dividends initiated by Hardin and Hill (2008), and extended by Chou et al. (2013).

We examine these issues with a sample of U.S. equity REITs from 1999 to 2009.[1] The main purpose is to measure the impact of excess dividends on growth. We make several adjustments in the experimental design. First, recognizing that dividend policy and investment policy are jointly determined, we apply the simultaneous equation model (SEM) framework to produce unbiased estimates of the impact of dividends on growth. Second, mandatory dividends are not under REIT managers' discretion. Following Hardin and Hill (2008), dividend policy is measured as *excess dividends*, the portion of dividends over and above the statutorily required level. Third, agency theory involves funding through external channels. Therefore, we strip out the portion of growth funded by external capital. Following Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006), we construct three measures of excess growth to capture the portion of realized growth rate beyond the level funded by (1) internal funds, (2) internal and short-term debt, and (3) all non-equity financing. These externally financed growth measures are proxies for REITs' access to external capital markets.

Three versions of externally financed growth measures are regressed against excess dividends. Coefficients are estimated with the two stage least squares method. Our analyses show that externally financed growth is consistently and positively related to excess dividends, both before and after controlling for an extensive list of firm characteristics associated with dividend and investment policies. This finding is consistent with the agency theory prediction that payment of dividends induces higher growth. Furthermore, we find the positive relation between dividends and growth to be much stronger among REITs with more growth opportunities and need for external capital (high Tobin's Q firms), and among REITs that issue debt or equity in the capital market. These findings suggest that dividend signaling is not the driving force for the positive relation, because signaling implies unconditionality with respect to Tobin's Q or security issuance. We also rule out mergers and acquisitions as a factor behind this finding. Further robustness checks eliminate CEO entrenchment,

[1] This sample largely coincides with those of recently studies Hardin and Hill (2008) and Chou et al. (2013).

institutional ownership, alternative measurements of growth, and spurious regression as potential explanations.

We contend that relating excess dividends to externally financed growth of REITs is an innovative way to test the agency theory of dividends. As noted by Khurana et al. (2006), direct test of the link between dividends and cost of capital suffers from potential measurement errors of cost of capital. In addition, cost of capital may not fully capture the agency conflicts that dividends help mitigate, whereas growth provides a comprehensive measure of agency conflicts. To elaborate, if investors fail to fully anticipate moral hazard problems, growth may be stunted despite competitive capital costs. As a closely regulated sector, however, agency conflicts may be attenuated in REITs. Under this premise, we test the relation between excess dividends and cost of capital via two proxies. We find excess dividends and the two proxies of cost of capital to be significantly negatively related. These results confirm that our finding of positive relation between excess dividends and growth indeed derives from the reduction in cost of capital induced by lower agency costs. However, based on small samples, these results must be validated by future research.

This paper makes important contributions to the mainstream literature on dividend policy. In a survey paper on payout policy, Allen and Michaely (2003) find "practically no support" for the theory that dividends resolve agency problems. The authors state, "a priori, we expect that the different incentives in the firm will interact more strongly with dividend policy… we believe this is an important area for future research." Our study utilizes the regulatory properties of REITs and finds strong support for the agency theory of dividends, and provides the first evidence that dividend payments do contribute to firm growth by lowering agency costs.

Related Literature and Hypothesis Development

The securities market in the U.S. is the major provider of capital for firms in need of investment funds. How frequently firms access the capital market depends on availability of internal funds, and the cost of external capital. Recent theory and evidence indicates that cost of external capital is a function of information asymmetry between managers and investors, managers' incentive to disclose information, and their proclivity and opportunity to divert corporate resources to enhance their private benefits. For example, Myers and Majluf (1984) show that firms may forego profitable growth opportunities to avoid adverse selection costs associated with raising external funds. A stream of literature initiated by Jensen (1986) shows that unrestrained, self-interested managers use free-cash flow for personal gains to the detriment of shareholder wealth. In anticipation of these agency costs, outside investors demand higher returns when there is a lack of transparency, and corporate governance mechanisms are ineffective. In essence, firms without sufficient internal capital, and entrenched management may choose to forego profitable investment opportunities due to high cost of funding, with adverse consequences on growth and value (Stein 2003). Khurana et al. (2006) test the notion that greater information asymmetry and agency conflicts lead to lower growth. Consistent with the proposition, the authors find a significantly positive relation between a disclosure index and incremental growth financed by external funds.

A series of papers have explored and presented evidence of agency costs in REITs. Wang et al. (1993), Ghosh and Sirmans (2006), Feng et al. (2007), and Hardin and Hill (2008) all find evidence consistent with the notion that REITs tend to distribute dividends to compensate for agency issues between managers and shareholders. To reconcile the absence of hostile takeovers among REITs, Campbell et al. (2001) argue that REIT managers are likely to collude to thwart hostile takeovers since REIT assets are limited by regulation to the real estate sector.[2] Ghosh and Sirmans (2003) suggest that the regulation on REIT ownership prevents formation of large blockholders, which further exacerbates agency problems.[3] Feng et al. (2007) report that large depreciation write-offs in REITs result in internally generated cash far in excess of net income. This is consistent with the evidence in Ghosh and Sirmans (2006) that the average payout ratio in REITs exceeds 150 % of earnings. Ghosh et al. (2012) show that large cash reserves in REITs is positively related to the probability of being an acquirer, and Harford et al. (2008) find that excess cash reserve is useful in fending off hostile takeovers, allowing firms to avoid disciplinary forces of the market for corporate control. Clearly, in absence of monitoring and disciplinary market forces, REIT managers may choose to retain the excess cash and expense it for their own benefit such as empire-building.

What mechanism can REIT managers employ to signal their commitment to investors not to waste excess cash? We contend that the strict regulation of REITs helps mitigate the information asymmetry between managers and investors. To elaborate, REITs must pay out 90 % of taxable income as dividends, and are required to commit 75 % of their investment in real estate assets.[4] In addition, as noted by several previous authors, because of continuous marking to the market, real estate assets are easier to value. In the environment of highly restrictive regulatory structure, why do REITs pay dividends well in excess of the high mandatory level? Jensen (1986) provides the most intuitive and forceful rationale for this phenomenon. In his model, dividends reduce agency costs by denying entrenched managers access to free cash flow. High dividend payment also forces frequent trips to the capital market which subjects the firm to regular scrutiny by analysts and large institutional investors (Easterbrook (1984)). Periodic exposure to the markets improves information dissemination and reduces agency costs. In the special situation of REITs, therefore, excess dividends help reduce agency costs just as greater disclosure does for unregulated firms.

A growing literature has recently explored the effectiveness of excess dividends–actual dividends less the mandatory level–in ameliorating agency costs. Initiated by Hardin and Hill (2008), this evolving strand of literature notes that because of high level of mandatory dividend, researchers ought to focus on excess dividends to analyze the true impact of dividend distributions in REITs. Hardin and Hill (2008) estimate excess dividends as a function of firm-specific variables, including several proxies for agency costs. The authors report that REITs that pay higher excess dividends are better at using bank lines of credit. They interpret the result as

[2] 75 % of REIT assets must be held in cash, government securities, and real estate assets.

[3] A REIT must have more than 100 shareholders, and the five largest may not own more than 50 % of the total shares outstanding.

[4] The inability of REIT managers to invest outside the real estate sector is often cited as a reason why there are no hostile takeovers among REITs.

indicative of increased bank monitoring and enhanced transparency through payment of excess dividends, which facilitate operational efficiency and access to external funds. Finally, the positive, albeit weak, relation between excess dividends and Tobin's Q lends further credence to the notion that excess dividends contribute to growth through easier access to the capital market. Hardin and Hill (2008) conclude that REITs' dividend policy reflects the attempt to reduce agency costs to facilitate raising additional capital from debt and equity markets which is a necessity for an asset class that depends on external capital to support and sustain growth.

Chou et al. (2013) provide corroborative evidence for the link between REITs' excess dividends, governance, and value. Their analyses reveal that discretionary dividends are valued higher in REITs with less transparent operating structures. They further report that discretionary dividends are valued higher in REITs that are more than 50 % owned by insiders and affiliates. The evidence is consistent with the notion that excess dividends substitute for superior corporate governance structures. Ghosh et al. (2011) provide evidence to suggest that excess dividends reduce agency costs and cost of raising equity capital. They report that excess dividends attenuate the negative valuation effect associated with announcements of seasoned equity offerings by REITs.

While these studies uncover evidence consistent with the notion that discretionary dividends is an effective tool for mitigating agency conflicts, and enhancing firm value, to our knowledge, there is no direct evidence that excess dividends induce growth (and, hence higher value) by facilitating access to capital at competitive rates. Our objective is to fill this important gap in the literature. Following Khurana et al. (2006), we advance the following testable hypothesis:

> *Hypothesis:* The externally financed growth of REITs is positively associated with dividend payments in excess of the mandatory amount.

For a broad perspective on this notion, we note that the role of dividends in reducing information asymmetry and agency conflicts which enhances access to external funding for growth is similar in spirit to the role of bank lines of credit as a financing vehicle of REITs. Hardin and Wu (2010) investigate the recent increase in REITs' use of liquidity provided by bank loans. Following Diamond (1991), Hardin and Wu argue that bank loans offer efficient monitoring services and help young companies to build creditworthiness. As a young industry experiencing rapid growth, access to capital market may be constrained for REITs due to potential information asymmetry and agency conflicts. Usually issued against future cash flows and not cash flows specific to any property, bank loans provide effective certification and monitoring of REITs' acquisition strategies. In addition, as the recent literature on relationship banking demonstrates, repeated banking relationship reduces cost of borrowing and other capital market frictions. Furthermore, the repeal of the Glass-Steagall Act in 1999 which allows commercial banks to directly underwrite public securities, improves access to the public debt market for REITs with existing lending relationships. Indeed, Riddiough and Wu (2009) find that for cash-constrained firms such as REITs, bank lines of credit are effective in smoothing cash flows and enhancing investment. Hardin and Wu (2010) report that REITs with banking relationships have lower secured debt ratios and use less leverage. So, by providing the

financial flexibility to maintain an adequate amount of liquidity at lower debt ratios, bank lines of credit allow REITs to obtain financing at more competitive rates, and boost investment and growth.[5] In essence, our evidence on the impact of excess dividend payments on growth through external funding complements the growing literature on the role of bank lines of credit in access to public capital market and growth.[6]

Empirical Method

Following Hardin and Hill (2008), we use excess dividends to represent REIT dividend policy, and follow Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006) to capture the externally financed portion of growth. The relation between excess dividends and externally financed growth is jointly determined with SEMs.

Excess Dividends

Hardin and Hill (2008) recognize that only the discretionary portion of REIT dividends (i.e. excess dividends) really matters to corporate dividend policy; therefore, only excess dividends reflect agency problems. Hardin and Hill define excess dividends as common dividends paid less 90 % of taxable income–the mandatory level of dividends to maintain the tax-preferred REIT regulatory status. Chou et al. (2013) point out that this measure of excess dividends is only an estimate subject to measurement error as taxable income may vary based on differences in financial and tax accounting rules. Boudry (2011) argues that REIT income can be derived from ordinary income, capital gains, and return of capitals, and REITs only need to pay 90 % of ordinary income to maintain REIT status. To avoid paying any tax, REITs need to pay out all of the ordinary income and capital gains. Boudry (2011) uses REITs self-reported Form 1099-DIV from NAREIT to develop two alternative measures of mandatory dividends based on either maintaining REIT status or avoiding paying any federal income tax. Unfortunately, measuring excess dividends as prescribed by Boudry (2011) produces a final sample with insufficient observations to perform our empirical analyses.[7] Therefore, for ease of calculation and large data coverage, we adopt Hardin and Hill's (2008) definition of excess dividends as a

[5] Hardin and Hill (2011) report strong association between REITs' line of credit availability and dividend payment, investment and capital market access. The authors find an inverse relation between equity offerings and line of credit, which implies that REITs use lines of credit as a precautionary measure, and use equity to rebalance capital structure. Hill, Kelly and Hardin (2012) test the substitutability between cash and line of credit. They find that unused credit lines are significantly less valued than cash, and vice versa.

[6] Ooi et al. (2010) find evidence that bank credit lines can protect REITs when credit quality deteriorates and provide financial slack to support investment opportunities. Ooi et al. (2010) show that in their financing choices, REITs are driven by both market timing and target capital structure. When REITs deviate from target debt ratios to adjust to market conditions, lines of credit can provide the necessary liquidity.

[7] With data from Form 1099-DIV, we have 95 firm-year observations and 43 REITs. Our regression analysis with this small sample produces correct coefficient sign for excess dividend but no statistical significance.

proxy for REIT dividend policy. It is worth noting that Chou et al. (2013) report that the relation between excess dividends and agency costs is not sensitive to how excess dividend is calculated.

Externally Financed Growth

Demirgüç-Kunt and Maksimovic's (1998) implementation of a firm-based financial planning model inspires our measure of externally financed growth.[8] Specifically, we calculate three measures of constrained growth a firm can achieve by using (1) internal cash flow (IG), (2) short-term financing (SFG), and (3) sustainable growth with both short-term and long-term debt (SG). The derivation of these measures is presented in Appendix A. Next, we compute the difference between actual realized growth rate in sales (GROWTH) and the three measures of predicted constrained growth rate (IG, SFG, and SG). These differences are denoted as EXCESS_IG, EXCESS_SFG, and EXCESS_SG, and they approximate the maximum level of growth that the firm can achieve through using all form of external funds (EXCESS_IG), both long-term debt and equity (EXCESS_SFG), and all equity (EXCESS_SG). Under our hypothesis, these measures are predicted to be inversely related to agency costs, because high agency costs would prevent firms from accessing external funds at competitive rates.

In line with Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006), we calculate three metrics that are analogous to the three continuous excess growth measures, EXCESS_IG, EXCESS_SFG, and EXCESS_SG. Specifically, in three consecutive years, we calculate the proportion of years in which EXCESS_IG, EXCESS_SFG, and EXCESS_SG are greater than zero, and denote them PROP_IG, PROP_SFG and PROP_SG. The use of proportion-based variables reduces any bias due to outliers, and also measurement errors in externally financed growth due to internal growth being measured approximately, and the potential for the difference between realized growth and internal growth being related to unspecified factors.[9] Finally, to match the measurement of growth variables, we also average other variables over time.

Simultaneous Equation Model

We control for firm fundamentals and characteristics that are potentially related to firm dividend and investment policies when we test the relation between externally financed growth and excess dividends A profitable and growing firm can be perceived to be of low risk by investors, and it can also simultaneously distribute more

[8] Demirgüç-Kunt and Maksimovic's (1998) externally financed growth measures are appropriate for our study for two reasons. First, these measures derived from general financial planning models (e.g., Higgins (1977)), which are not industry specific. Khurana et al. (2006) apply this set of measures to the cross-section of all firms without excluding regulated industries. Second, we compare these growth measures among a sample of U.S. incorporated equity REITs. The homogeneous business model of our sample makes these growth measures comparable between firms.

[9] In unreported results, we use untransformed excess growth measures to perform our analysis, and find coefficients of excess dividends are still significantly related to EXCESS_IG and EXCESS_SFG, but not significant with EXCESS_SG. This is likely due to the issues we just discussed.

dividends, whereas a poorly performing firm can be regarded as risky and likely to cut back both investment and distribution. To account for this simultaneity, we construct simultaneous equation models (SEMs) to determine the effect of excess dividends on externally financed growth. This method has been used by Khurana et al. (2006) to account for the simultaneity between firm investment and disclosure policies. The two equations in the simultaneous system are as following:

$$\begin{aligned}\mathrm{EXDIV_t} = {} & \alpha_0 + \alpha_1 \mathrm{EXDIV_{t-1}} + \alpha_2 \mathrm{EXFFO_{t-1}} + \alpha_3 \Delta \mathrm{EXFFO_t} + \alpha_4 \mathrm{MANDIVRATE_t} \\ & + \alpha_5 \Delta \mathrm{MANDIVRATE_t} + \alpha_6 \mathrm{Q_t} + \alpha_7 \mathrm{SIZE_t} + \alpha_8 \mathrm{LEV_t} + \alpha_9 \mathrm{TYPE_t} + \alpha_{10} \mathrm{ADV_t} \\ & + \alpha_{11} \mathrm{COMMREPO_t} + \alpha_{12} \Delta \mathrm{COMMREPO_t} + \alpha_{13} \mathrm{LOC_t} + \alpha_{14} \mathrm{GAEXt} \\ & + \alpha_{15} \mathrm{ASSETTO_t} + \mu_t. \end{aligned} \tag{1}$$

$$\begin{aligned}\mathrm{PROP\_EFG_t} = {} & \beta_0 + \beta_1 \mathrm{EXDIV_t} + \beta_2 \mathrm{Q_t} + \beta_3 \mathrm{SIZE_t} + \beta_4 \mathrm{FIN_t} + \beta_5 \Delta \mathrm{PROFITMGN_t} \\ & + \beta_6 \Delta \mathrm{ASSETTO_t} + \beta_7 \mathrm{TYPE_t} + \nu_t \end{aligned} \tag{2}$$

Equation (1) describes the determination of excess dividends, and Eq. (2) captures variables related to externally financed growth. The excess dividend model includes variables that cover a broad range of firm characteristics and incentives to make high dividend distribution. We jointly estimate this equation with the growth Eq. (2) that includes variables directly related to firm growth. Detailed description of the variables follows.

The excess dividend Eq. (1) is based on Hardin and Hill's (2008) excess dividend model. EXDIV is common dividends paid less mandatory dividend payment, which equals 90 % of before tax income, divided by current period total asset. We contend that agency problems are deep-rooted in a firm, and do not change rapidly. So, agency costs are persistent over time.[10] The persistence of agency costs implies that dividend policy should be serially correlated conditional on other firm characteristics that capture agency costs, growth opportunities, and financial constraints. Therefore, we include the lagged value of excess dividends, and predict its sign to be positive. Following Boudry (2011), we include mandatory dividends MANDIVRATE and change in mandatory dividends ΔMANDIVRATE, both of which are expected to be negatively related to dividends.[11]

EXFFO is excess funds from operations, measured as net income excluding gains or losses from sales of property, plus depreciation and amortization and after adjustments for unconsolidated partnerships and joint ventures, minus the mandatory dividend payment, all divided by total assets from previous period. ΔEXFFO is the difference of excess funds from operations in the current period minus excess funds from operations in the previous period, scaled by current period total assets. We include these variables to capture the availability and distribution of internal funds.

[10] Florackis and Ozkan (2009) empirically investigate the relationship between managerial entrenchment and agency costs with a large UK sample, and they find agency costs are persistent over time.

[11] The explanatory variables in Boudry's (2011) study also include a few that are not in Hardin and Hill (2008), such as S&P credit rating availability, location Herfindahl, type Herfindahl, and Baker and Wurgler's (2004) market dividend premium. However, none of these additional variables are significantly related to excess dividends, therefore we do not include them in our version of excess dividend model.

They are predicted to be positively related because excess free-cash flow exacerbates agency costs and increases demand for excess dividends. COMMREPO is common stock repurchased divided by total assets. ΔCOMMREPO is common stock repurchased in the current period minus common stock repurchased in the previous period, all divided by current period total assets. As substitutes for cash distribution, stock repurchase and change in stock repurchase are expected to be negatively related to excess dividends.

Several firm characteristics are included in the dividend model as control variables.[12] Q stands for Tobin's Q, measured as the sum of market capitalization, total debt and preferred equity, divided by total assets. Hardin and Hill (2008) argue that Tobin's Q is a proxy for a firm's access to the capital market; better access to capital market augments a firm's ability to pay dividends. Lang et al. (1991), and Servaes (1991) interpreted Tobin's Q as a measure of managerial performance, which also implies a positive relation between Tobin's Q and excess dividends. Tobin's Q is often used also as a proxy for growth opportunities (e.g. Lang et al. 1996). It is intuitive that firms with more growth opportunities need more external financing. Under the hypothesis that dividends reduce the agency cost of free-cash flow, and the cost of external financing, Tobin's Q should be positively correlated with excess dividends. SIZE is the natural logarithm of market value of equity in 2005 dollars. The relation between size and excess dividends is ambiguous. Assuming that larger REITs have less volatile cash flows, they can afford higher dividends. Conversely, if a larger firm generates more cash flow, it is less dependent on external capital; consequently, it need not distribute excess dividends to reduce cost of external funds. LEV is the leverage ratio measured as total debt (long-term debt plus short-term debt) divided by total assets. Leverage is predicted to have a negative sign. First, mandatory interest payment on debt can act as a means of mitigating agency costs, thereby reducing the need for excess dividends. Conversely, high leverage may induce high cash flow volatility, and hence low dividend payout (Bradley et al. 1998). TYPE is a set of dummy variables identifying the type of real estate property.[13] We do not predict the signs for different property types as they are essentially control variables.

Hardin and Hill (2008) identify two variables that are closely related to REITs' agency problems. ADV is an indicator variable that equals 1 for internally advised REITs. The advisement type is expected to have a negative effect because internal advisement helps to mitigate agency conflicts, and reduce the need for excess dividends (Ambrose and Linneman (2001)). Hardin and Hill (2008) find evidence consistent with this notion. LOC is the amount drawn from available credit lines. Use

[12] We exclude ROA from our dividend equation because the Spearman rank correlation coefficient between ROA and mandatory dividend rate is close to 1 with our sample (The Pearson coefficient is slightly lower). This is because mandatory dividend is a fraction of pretax income, and earnings is highly correlated with pretax income given the rather insignificant role of tax REITs pay. In Bondry's study, the correlation between these two variables is 0.70. The lower coefficient is the result of using two difference data sources to calculate earnings and pretax income.

[13] Hardin and Hill (2008) reduce the number of property focus categories by grouping mall, retail or shopping as RETAIL, diversified, manufactured homes or other as OTHER. The resulting seven categories are: MULTIFAMILY, RETAIL, OFFICE, INDUSTRIAL, SELF-STORAGE, HOTEL, and OTHER.

of credit line can have a positive effect because draws from the line of credit generate funds to support dividend payments. Alternatively, a negative impact is consistent with the premise that credit lines reduce agency costs by subjecting the REITs to external monitoring, Hardin and Hill (2008) report a significantly positive impact of lines of credit on excess dividends.

As Hardin and Hill (2008) observe, alleviating agency conflicts is one of the main motivations for REITs to pay excess dividends. Accordingly, we include two variables from previous literature to explicitly capture agency costs. Ang et al. (2000) use two proxies for managerial efficiency–GAEX (general and administrative expense scaled by sales), and ASSETTO (sales divided by total asset).[14] GAEX measures how efficiently management controls operating costs, especially excess perquisites and other direct agency costs. High GAEX is indicative of greater agency problems. Managers of high GAEX firms may pay high dividends to avoid shareholder sanction, which implies a positive relation between GAEX and EXDIV. ASSETTO measures how efficiently management deploys assets. Ang et al. (2000) assert that agency costs arise because negligent and entrenched managers tend to make poor investment decisions, consume executive perquisites, and exert insufficient effort that results in lower revenue. Therefore, ASSETTO is negatively related to agency costs. In our model, a firm with low agency costs has lower incentive to distribute dividends as compensation for shareholders. Thus, the sign of ASSETTO is expected to be negative.

Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006) note that there is no theoretically motivated growth model, so they estimate externally financed growth as a function of variables that are expected to impact growth. We adopt this approach and regress measures of externally financed growth on excess dividends (EXDIV), and a set of control variables including natural logarithm of market capitalization (SIZE), Tobin's Q (Q), total equity and debt capital raised scaled by total assets (FIN), change in total revenue scaled by total asset (ΔASSETTO), and change in net income scaled by total revenue (ΔPROFITMGN). This set of variables is also employed by Khurana et al. (2006) in their analysis of the impact of disclosure on growth.

The externally financed growth variable PROP_EFG takes the values of PROP_IG, PROP_SFG, and PROP_SG. The agency theory of dividends predicts a positive sign for EXDIV because higher excess dividends reduce external financing costs and enhance growth. Tobin's Q controls for growth opportunities, and it should be positively related to growth. The sign of SIZE is difficult to predict as larger firms usually experience slower growth, but larger firms are also less financially constrained. FIN captures firm's reliance on external funds, as well as availability of external funds for growth, so its relation to growth should be positive. Following prior research, we also include changes in firm performance; specifically, changes in profit margin and asset turnover. An increase in profit margin measures firm's ability to control costs incurred to generate revenues (Fairfield and Yohn 2001). Therefore, increase in profit margin indicates increase in internally generated cash, which is

[14] We use general and administrative expense rather than the operating expense used in Ang et al. (2000) because large depreciation in REITs asset might not directly capture agency costs. However, our results are not sensitive to this change.

positively related to internally financed growth but negatively related to demand for external financing. As such, the effect of change in profit margin on externally financed growth is likely to be negative. Asset turnover measures a firm's ability to generate revenues from its assets. Changes in asset turnover impacts a firm's ability to generate sales from its asset in place, therefore changes in asset turnover can both influence total growth and internally financed growth. The sign of changes in asset turnover cannot be determined unambiguously.

Estimation of the coefficients in the equation system is based on the two-stage least squares (2SLS) method for its advantage of producing consistent estimates for endogenous regressors. The fitted values of EXDIV from Eq. (1) using all exogenous variables in the equation systems are uncorrelated with the error term in the externally financed growth equation. To account for the heterogeneity among REITs and the autocorrelation caused by averaging regression variables over time periods, we compute heteroscedasticity and autocorrelation consistent t-statistics with the Newey-West method. In addition, we also use cross-sectional (between-estimator) estimation for our SMEs as in Ghosh and Sirmans (2006) and Hardin and Hill (2008). The between-estimator methodology reduces problems from short-term fluctuations in firm characteristics and the autocorrelation of the error terms. We take the averages of all variables in all consecutive years to form the cross-section for our estimation, but keep the first lagged excess dividends in the sample. T-statistics of the between-estimators are also corrected for heteroscedasticity.

Data

All publicly traded, U.S. incorporated equity REITs in the SNL REIT database between 1999 and 2009 are included in our initial sample. Data on firm characteristics, accounting, and financing variables are obtained from SNL. By requiring non-missing data for all our test variables, we have 794 firm-year observations. Since externally financed growth measures are computed with data from three consecutive years, we take 3-year averages of all regression variables. For example, for MKTCAP in 2001, we average the market capitalization in years 2001, 2002, and 2003. This calculation leaves us 519 non-missing firm-year observations, representing 107 unique REITs.[15] We use Thomson ONE Banker for data on public debt and equity issues, and mergers and acquisitions. CEO entrenchment and institution ownership data are hand-collected from SNL Annual Handbooks.

[15] Since our final sample has 275 less firm-year observations, and 29 less unique REITs than the sample without 3-year data availability constraint, we need to test if our sample suffers from selection bias. We compare a battery of variables between the final sample with 3-year averages and the one without such restriction, and we find no statistical difference in sample mean. Since our main dependent variable PROP_IG, PROP_SFG, and PROP_SG have to be calculated over several years, we cannot run our main regression with the larger sample. However, our realized sales growth regression with the relaxed sample shows stronger support for the agency theory of dividends than the more constrained sample. This can be attributed to the fact that unsuccessful REITs may suffer more agency problem, and the effect of dividends in reducing agency costs is more pronounced.

Summary Statistics

Table 1 reports the summary statistics for excess dividends, various growth measures, and other firm-specific variables in 3-year averages, except for lagged excess dividends, which is the excess dividends in the year before the 3-year averaging period.[16] To avoid the influence of outliers, we winsorize top and bottom 1 % of all variables except dichotomous variables and PROP_IG, PROP_SFG, and PROP_SG. Our results are not sensitive to the level of winsorization.

The average growth rate of sales for REITs is 14.8 % per year (GROWTH). Consistent with the prevalent notion that the majority of REITs rely on external financing–short-term and long-term–to fund growth, we find 73.3 % of REITs grow beyond the level achievable only through internal funds (PROP_IG), 69 % grow more than the level achievable through both internal funds and short-term financing (PROP_SFG), and 56.5 % of the firms can achieve higher growth than without using equity (PROP_SG). The small difference between PROP_IG and PROP_SFG suggests that short-term debt does not play a significant role in REIT growth. The PROP_SG number indicates that 56.5 % of the REITs use equity financing for growth. These numbers confirm the importance of external funds in REITs' growth. Comparing these numbers with the growth rates for the sample of industrial firms in Khurana et al. (2006), who report PROP_IG of 48 %, and PROP_SFG of 37 %, it is apparent that REITs rely more heavily on external financing for sustaining growth.

The mean excess dividends of our sample is 0.005 (EXDIV), which indicates that excess dividends amount to 0.5 % of an average REIT's total assets.[17] Hardin and Hill (2008) report mean excess dividends is 0.006. The dividend payout ratio PAYOUT indicates that REITs pay 72.8 % of funds from operations as dividends, consistent with Ghosh and Sirmans (2006). The statistics related to other firm variables such as Tobin's Q, leverage, credit line utilization, advisement type, excess funds from operations, changes in excess funds from operations, stock repurchases, and changes in stock repurchases are comparable with Hardin and Hill's (2008) summary statistics, with the exception of market capitalization. Our inflation adjusted market capitalization is larger. This is probably caused by our more restrictive data requirement, which screens out some of the smaller REITs with shorter history. Debt and equity issues (FIN) account for 9.9 % of total assets, which is higher than the 8 % reported by Khurana et al. (2006) for industrial firms. Our mandatory dividend measures are similar to those reported in Boudry (2011). Statistics on CEO entrenchment variables by and large match those of Ghosh and Sirmans (2006) and Feng et al. (2007). We measure institutional ownership as the percentage of outstanding shares held by institution investors, and its mean value is close to that of Feng et al. (2010). In summary, our sample statistics resemble those in the existing literature, which precludes concerns about any sample bias in our results.

Table 2 breaks down the sample by year in Panel A, and by property type in Panel B. On average, we have 58 REITs per year in our sample. The effect of the housing

[16] Besides taking 3-year averages of the externally financed growth measures, we also consider 2, 4, and 5 years of the externally financed growth variables. Our results do not change materially.

[17] Negative excess dividends reflect the fact that the excess dividends measure is an approximation as discussed in the "Empirical Method".

Table 1 Descriptive statistics

Variable	N	Mean	STD	Min	Median	Max
GROWTH	519	0.148	0.212	−0.155	0.095	1.851
PROP_IG	519	0.733	0.297	0	0.667	1
PROP_SFG	519	0.690	0.318	0	0.667	1
PROP_SG	519	0.565	0.380	0	0.667	1
EXDIV	519	0.005	0.015	−0.066	0.005	0.051
LAGEXDIV	519	0.004	0.017	−0.067	0.004	0.057
PAYOUT	517	0.728	0.427	0.000	0.692	4.488
BONDSPREAD	100	2.028	1.378	0.890	1.656	10.500
COSTOFEQ	475	0.093	0.065	−0.119	0.090	0.362
ISSUER	519	0.634	0.482	0.000	1.000	1.000
ACQUIRER	519	0.447	0.498	0.000	0.000	1.000
EXFFO	519	0.022	0.019	−0.049	0.024	0.081
LAGEXFFO	519	0.023	0.018	−0.044	0.025	0.081
ΔEXFFO	519	0.001	0.008	−0.052	0.002	0.030
MANDIVRATE	519	0.033	0.021	0	0.031	0.114
ΔMANDIVRATE	519	0.000	0.009	−0.044	0.000	0.050
Q	519	1.258	0.305	0.521	1.192	2.146
MKTCAP	519	1732	2319	8	942	12202
LEV	519	0.519	0.168	0.024	0.524	0.925
ROA	519	0.034	0.026	−0.073	0.034	0.127
FIN	519	0.099	0.131	0.000	0.046	0.736
ADV	519	0.902	0.298	0	1	1
GAEX	519	0.063	0.051	0.000	0.055	0.379
ASSETTO	519	0.160	0.064	0.068	0.147	0.486
LAGCOMMREPO	519	0.004	0.007	0	0.000	0.055
ΔCOMMREPO	519	0.000	0.004	−0.024	0	0.017
LOC	519	0.331	0.224	0	0.313	0.858
ΔASSETTO	519	0.000	0.012	−0.051	0.000	0.059
ΔPROFITMGN	519	−0.004	0.083	−0.393	−0.006	0.565
DUALITY	474	0.534	0.499	0.000	1.000	1.000
SENORITY	434	0.811	0.392	0.000	1.000	1.000
CEOOWNERSHIP	380	0.021	0.052	0.000	0.005	0.538
INDBOARD	427	0.844	0.194	0.265	0.857	2.000
BOARDSIZE	427	8.419	2.192	3.000	8.000	14.000
INSTOWNERSHIP	472	0.563	0.303	0.001	0.583	1.193

This table presents the descriptive statistics of our REIT sample. We include all REITs in the SNL database that have consecutive 3-year data on our regression variables from 2003 to 2009, and the lagged excess dividends variable in the year before the 3-year period. All continuous variables in the table are 3-year averages except PROP_IG, PROP_SFG, and PROP_SG. GROWTH is the percentage increase in sales. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the dividends distributed minus the 90 % of the pretax net income. PAYOUT is the proportion of dividends in funds from operation. BONDSPREAD is the yield difference of newly issued bonds and maturity-matched treasury bonds. COSTOFEQ is the cost of equity estimated from Fama and French three factor model. ISSUER is an indicator variable of issuing public debt and/or equity. ACQUIRER is an indicator variable of making a merger or acquisition. MANDIVRATE is the mandatory dividends divided by total assets, and ΔMANDIVRATE is the change in mandatory dividends divided by total asset. EXFFO is the funds from operations divided by total asset. ΔEXFFO is the annual change in funds from operations less changes in dividends, scaled by current total assets. MKTCAP is the inflation adjusted market capitalization. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. LEV is the total debt divided by total assets. ROA is net income divided by total assets. FIN is the sum of public debt and equity issues dividend by total assets. ADV is a dummy variable that equals one if the firm is self advised. GAEX is the general and administrative expense over total asset. ASSETTO is sales over total assets. COMMREPO is common share repurchase dividend by total asset. ΔCOMMREPO is the annual change in common share repurchases divided by current total assets. LOC is the percentage of credit line usage. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. DUALITY dummy is 1 when the CEO is also the chairman, 0 otherwise. SENORITY dummy takes value 1 when the CEO has over 4 years of tenure, 0 otherwise. CEOOWNERSHIP is the percentage of shares held by the CEO. INDBOARD is the percentage of independent board members on the board. BOARDSIZE is the number of board members. INSTOWNERSHIP is the percentage of shares held by institution investors

Table 2 Descriptive statistics by year and property type

Variables	Panel A: descriptive statistics by year									Panel B: descriptive statistics by property type					
	1999	2000	2001	2002	2003	2004	2005	2006	2007	RETAIL	OFFICE	INDUSTRIAL	SELF STORAGE	HOTEL	OTHER
N	6	73	67	72	63	59	55	62	62	146	71	26	18	37	221
GROWTH	0.169	0.140	0.138	0.147	0.189	0.216	0.170	0.121	0.064	0.180	0.112	0.247	0.126	0.246	0.111
PROP_IG	0.722	0.703	0.667	0.708	0.799	0.870	0.824	0.726	0.597	0.815	0.596	0.679	0.759	0.820	0.712
PROP_SFG	0.722	0.639	0.622	0.681	0.772	0.831	0.758	0.672	0.575	0.756	0.559	0.667	0.611	0.766	0.686
PROP_SG	0.667	0.507	0.498	0.574	0.640	0.684	0.612	0.548	0.473	0.600	0.469	0.654	0.611	0.676	0.540
EXDIV	0.000	0.006	0.007	0.006	0.005	0.003	0.002	0.004	0.008	0.003	0.005	0.003	0.000	0.010	0.007
LAGEXDIV	0.004	0.003	0.000	0.007	0.009	0.004	0.007	0.002	0.000	0.002	0.002	0.000	0.001	0.010	0.005
PAYOUT	0.556	0.607	0.660	0.763	0.762	0.750	0.756	0.797	0.770	0.696	0.620	0.661	0.620	0.632	0.815
BONDSPREAD		2.458	2.090	1.815	1.599	1.337	1.419	1.594	4.590	1.594	1.762	1.639		3.370	2.089
COSTOFEQ	0.115	0.120	0.117	0.094	0.112	0.103	0.076	0.083	0.024	0.071	0.110	0.071	0.085	0.134	0.098
ISSUER	0.167	0.548	0.612	0.639	0.635	0.678	0.636	0.629	0.758	0.658	0.479	0.769	0.778	1.000	0.579
ACQUIRER	0.167	0.329	0.358	0.347	0.508	0.576	0.582	0.532	0.435	0.582	0.296	0.538	0.500	0.703	0.348
EXFFO	0.019	0.028	0.026	0.023	0.021	0.018	0.019	0.019	0.022	0.020	0.030	0.022	0.036	0.020	0.021
LAGEXFFO	0.020	0.029	0.028	0.026	0.024	0.020	0.020	0.019	0.020	0.021	0.031	0.022	0.036	0.024	0.022
ΔEXFFO	0.003	0.002	0.001	0.000	−0.001	0.000	0.002	0.001	0.003	0.002	0.001	0.002	0.003	0.000	0.000
MANDIVRATE	0.029	0.031	0.031	0.033	0.034	0.036	0.037	0.033	0.028	0.030	0.026	0.027	0.043	0.020	0.038
ΔMANDIVRATE	−0.001	−0.002	−0.001	0.002	0.002	0.002	0.000	−0.002	−0.005	−0.001	−0.002	−0.001	0.000	0.000	0.000
Q	0.980	1.088	1.169	1.270	1.340	1.407	1.404	1.285	1.187	1.266	1.052	1.211	1.422	1.077	1.341
MKTCAP	1683	982	1200	1518	1868	2377	2392	2059	1777	1373	1399	2864	4147	1806	1734
LEV	0.497	0.533	0.519	0.516	0.509	0.509	0.514	0.523	0.529	0.564	0.497	0.528	0.287	0.479	0.521
ROA	0.031	0.031	0.032	0.035	0.036	0.038	0.040	0.035	0.027	0.031	0.027	0.028	0.048	0.011	0.042
FIN	0.005	0.075	0.120	0.147	0.139	0.113	0.073	0.057	0.068	0.128	0.056	0.083	0.094	0.187	0.081
ADV	1.000	0.904	0.896	0.903	0.889	0.864	0.909	0.919	0.919	0.945	0.887	1.000	1.000	0.865	0.864
GAEXPENSE	0.062	0.055	0.056	0.062	0.067	0.070	0.066	0.068	0.064	0.091	0.049	0.066	0.062	0.028	0.055
ASSETTO	0.136	0.156	0.158	0.158	0.161	0.162	0.160	0.164	0.163	0.137	0.143	0.140	0.165	0.287	0.161

Table 2 (continued)

Variables	Panel A: descriptive statistics by year									Panel B: descriptive statistics by property type					
	1999	2000	2001	2002	2003	2004	2005	2006	2007	RETAIL	OFFICE	INDUSTRIAL	SELF STORAGE	HOTEL	OTHER
LAGCOMMREPO	0.010	0.006	0.006	0.004	0.002	0.002	0.002	0.004	0.004	0.003	0.006	0.003	0.007	0.001	0.004
ΔCOMMREPO	0.005	−0.001	−0.001	−0.002	−0.001	0.000	0.002	0.000	−0.001	0.000	−0.002	−0.001	−0.001	0.000	0.000
LOC	0.374	0.418	0.364	0.335	0.311	0.261	0.295	0.310	0.327	0.322	0.417	0.427	0.301	0.231	0.318
ΔASSETTO	−0.001	0.003	0.002	0.001	0.000	−0.001	−0.002	−0.001	−0.001	−0.001	−0.002	0.004	0.001	0.013	−0.001
ΔPROFITMGN	−0.008	−0.020	−0.015	0.019	0.018	0.029	0.011	−0.015	−0.052	−0.009	−0.016	−0.001	−0.001	−0.024	0.007
DUALITY	0.833	0.523	0.525	0.508	0.544	0.519	0.538	0.542	0.542	0.546	0.492	0.615	1.000	0.188	0.541
SENORITY	0.667	0.909	0.839	0.758	0.704	0.792	0.809	0.827	0.860	0.847	0.862	0.750	0.824	0.821	0.776
CEOOWNERSHIP	0.026	0.069	0.052	0.046	0.019	0.014	0.009	0.009	0.009	0.035	0.017	0.007	0.029	0.004	0.016
INDBOARD	0.819	0.800	0.823	0.825	0.841	0.865	0.863	0.865	0.868	0.899	0.695	0.805	0.840	0.886	0.851
BOARDSIZE	8.867	8.293	8.207	8.285	8.327	8.653	8.462	8.508	8.542	8.507	8.227	9.507	6.556	9.333	8.313
INSTOWNERSHIP	0.555	0.367	0.422	0.501	0.534	0.583	0.655	0.716	0.765	0.545	0.709	0.416	0.578	0.659	0.525

This table presents the variable averages of our REIT sample by year and by property focus type in panel A and B respectively. We include all REITs in the SNL database that have consecutive 3-year data on our regression variables from 2003 to 2009, and the lagged excess dividends variable in the year before the 3-year period. All continuous variables in the table are 3-year averages except PROP_IG, PROP_SFG, and PROP_SG. GROWTH is the percentage increase in sales. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the dividends distributed minus the 90 % of the pretax net income. PAYOUT is the proportion of dividends in funds from operation. BONDSPREAD is the yield difference of newly issued bonds and maturity-matched treasury bonds. COSTOFEQ is the cost of equity estimated from Fama and French three factor model. ISSUER is an indicator variable of issuing public debt and/or equity. ACQUIRER is an indicator variable of making a merger or acquisition. MANDIVRATE is the mandatory dividends divided by total assets, and ΔMANDIVRATE is the change in mandatory dividends divided by total asset. EXFFO is the funds from operations divided by total asset. ΔEXFFO is the annual change in funds from operations less changes in dividends, scaled by current total assets. MKTCAP is the inflation adjusted market capitalization. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. LEV is the total debt divided by total assets. ROA is net income divided by total assets. FIN is the sum of public debt and equity issues dividend by total assets. ADV is a dummy variable that equals one if the firm is self advised. GAEX is the general and administrative expense over total asset. ASSETTO is sales over total assets. COMMREPO is common share repurchase dividend by total asset. ΔCOMMREPO is the annual change in common share repurchases divided by current total assets. LOC is the percentage of credit line usage. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. DUALITY dummy is 1 when the CEO is also the chairman, 0 otherwise. SENORITY dummy takes value 1 when the CEO has over 4 years of tenure, 0 otherwise. CEOOWNERSHIP is the percentage of shares held by the CEO. INDBOARD is the percentage of independent board members on the board. BOARDSIZE is the number of board members. INSTOWNERSHIP is the percentage of shares held by institution investors

boom is noticeable in the average growth rate of 16.3 % per annum over the 2001 to 2006 period (note that 2004 data averages observations from 2004 to 2006). Dependence on external funds also peaked in the 2004 to 2006 period. To control for the year-to-year variation in our variables of interest, we examine the robustness of our results with year fixed-effects. In unreported analyses, we find that the year fixed-effect are essentially insignificant and including them does not change our results.

It is apparent that there are large differences among different property types. The average growth rate in INDUSTRIAL and HOTEL properties are much larger than for other property types. The reliance on external financing also varies among property types. For instance, HOTEL and INDUSTRIAL properties register fast growth by using equity financing, while OFFICE properties experience the lowest growth using only internal funds. To control for the variation in externally financed growth introduced by property type, we include property type dummies in our subsequent analyses.

Table 3 compares the sample statistics by partitioning the sample into high and low realized sales growth rates (GROWTH), and high and low excess dividends (EXDIV). Variables with significant difference in mean are marked with asterisks. When partitioned by growth, excess dividend is slightly higher in the low growth subsample without statistical significance (0.005 vs. 0.006). But when partitioned by excess dividends, all growth measures are higher in the high EXDIV group, and the difference is significant for PROP_SFG and PROP_SG. These comparisons indicate that high excess dividends drive higher externally financed growth, rather than high growth leading to higher excess dividends. The PAYOUT ratios in the high and low growth subsamples show no significant difference. We defer discussion of the cost of equity and bond spread yield to later. Analyses of other firm characteristics reveal that the high excess dividend firm is smaller, has more excess funds, has higher leverage, spends less on repurchasing stocks, and has improving asset turnover but declining profit margin. This type of firms seems to have greater agency problems, and hence can benefit more from agency costs reduction.

Correlations

We present the Spearman rank correlation coefficients in Table 4. The main relation of interest is the correlation of externally financed growth measures with excess dividends. The correlation coefficients between EXDIV and PROP_IG, PROP_SFG, and PROP_SG are between 0.04 and 0.15. These positive correlations are consistent with the agency theory of dividends and the reliance of REITs on external funds for growth. We test formally if the positive relation is significant and robust to the inclusion of other control variables in the next section. The correlation coefficients between some pairs of variables are high. In our regressions, we avoid having any pair of regressors with correlation coefficient of more than 0.8.[18] For example, we eliminate ROA from the excess dividends model because it is highly correlated with mandatory dividend payment.

[18] The correlation among our regression variables are similar to Boudry (2011) and Khurana's et al. (2006) study. Judge et al. (1980, page 459) state that a Spearman rank correlation lower than 0.8 should not be concerned.

Table 3 Descriptive statistics by high and low excess dividends and sales growth

Variables	High growth	Low growth	High EXDIV	Low EXDIV
N	260	259	260	259
GROWTH	0.269	0.025***	0.154	0.141
PROP_IG	0.908	0.557***	0.741	0.725
PROP_SFG	0.876	0.505***	0.719	0.662**
PROP_SG	0.777	0.353***	0.601	0.529**
EXDIV	0.005	0.006	0.016	−0.006***
LAGEXDIV	0.003	0.004	0.010	−0.002***
PAYOUT	0.709	0.747	0.854	0.600***
BONDSPREAD	1.926	2.144	2.182	1.880
COSTOFEQ	0.087	0.098*	0.091	0.095
ISSUER	0.704	0.564***	0.696	0.571***
ACQUIRER	0.581	0.313***	0.477	0.417
EXFFO	0.022	0.022	0.027	0.018***
LAGEXFFO	0.023	0.024	0.027	0.020***
ΔEXFFO	0.003	−0.001***	0.002	0.000***
MANDIVRATE	0.029	0.037***	0.027	0.039***
ΔMANDIVRATE	−0.001	0.000	−0.002	0.001***
Q	1.229	1.287**	1.249	1.267
MKTCAP	1634	1830	1226	2239***
LEV	0.529	0.509	0.532	0.506*
ROA	0.030	0.038***	0.028	0.040***
FIN	0.125	0.072***	0.108	0.090
ADV	0.904	0.900	0.896	0.907
GAEXPENSE	0.070	0.056***	0.063	0.063
ASSETTO	0.152	0.168***	0.158	0.162
LAGCOMMREPO	0.002	0.006***	0.003	0.005**
ΔCOMMREPO	0.000	−0.001**	0.000	0.000
LOC	0.321	0.341	0.393	0.270***
ΔASSETTO	0.002	−0.002***	0.002	−0.002***
ΔPROFITMGN	−0.010	0.003*	−0.016	0.009***
DUALITY	0.513	0.553	0.572	0.498
SENORITY	0.833	0.792	0.831	0.792
CEOOWNERSHIP	0.024	0.018	0.012	0.030***
INDBOARD	0.850	0.839	0.864	0.827**
BOARDSIZE	8.345	8.490	8.120	8.684***
INSTOWNERSHIP	0.538	0.587*	0.546	0.581

This table compares the variable averages by high and low excess dividends and sales growth. We include all REITs in the SNL database that have consecutive 3-year data on our regression variables from 2003 to 2009, and the lagged excess dividends variable in the year before the 3-year period. All continuous variables in the table are 3-year averages except PROP_IG, PROP_SFG, and PROP_SG. GROWTH is the percentage increase in sales. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the dividends distributed minus the 90 % of the pretax net income. PAYOUT is the proportion of dividends in funds from operation. BONDSPREAD is the yield difference of newly issued bonds and maturity-matched treasury bonds. COSTOFEQ is the cost of equity estimated from Fama and French three factor model. ISSUER is an indicator variable of issuing public debt and/or equity. ACQUIRER is an indicator variable of making a merger or acquisition. MANDIVRATE is the mandatory dividends divided by total assets, and ΔMANDIVRATE is the change in mandatory dividends divided by total asset. EXFFO is the funds from operations divided by total asset. ΔEXFFO is the annual change in funds from operations less changes in dividends, scaled by current total assets. MKTCAP is the inflation adjusted market capitalization. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. LEV is the total debt divided by total assets. ROA is net income divided by total assets. FIN is the sum of public debt and equity issues dividend by total assets. ADV is a dummy variable that equals one if the firm is self advised. GAEX is the general and administrative expense over total asset. ASSETTO is sales over total assets. COMMREPO is common share repurchase dividend by total asset. ΔCOMMREPO is the annual change in common share repurchases divided by current total assets. LOC is the percentage of credit line usage. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. DUALITY dummy is 1 when the CEO is also the chairman, 0 otherwise. SENORITY dummy takes value 1 when the CEO has over 4 years of tenure, 0 otherwise. CEOOWNERSHIP is the percentage of shares held by the CEO. INDBOARD is the percentage of independent board members on the board. BOARDSIZE is the number of board members. INSTOWNERSHIP is the percentage of shares held by institution investors. Significant difference in mean at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

Table 4 Spearman rank correlation coefficients of regression variables

Variables	GROWTH	PROP_IG	PROP_SFG	PROP_SG	EXDIV	LAGEXDIV	LAGEXFFO	ΔEXFFO	MANDIVRATE	ΔMANDIVRATE	Q	MKTCAP	LEV	ROA
PROP_IG	0.67													
PROP_SFG	0.65	0.92												
PROP_SG	0.58	0.66	0.75											
EXDIV	−0.02	0.04	0.11	0.15										
LAGEXDIV	−0.05	0.09	0.11	0.12	0.51									
LAGEXFFO	−0.07	−0.13	−0.22	−0.32	0.31	0.23								
ΔEXFFO	0.32	0.20	0.18	0.14	0.17	−0.22	0.03							
MANDIVRATE	−0.16	−0.06	−0.08	0.00	−0.44	−0.21	−0.10	−0.11						
ΔMANDIVRATE	−0.04	0.00	−0.04	−0.02	−0.25	0.33	0.06	−0.41	0.21					
Q	−0.08	0.08	0.07	0.05	−0.07	0.04	0.06	0.00	0.57	0.16				
MKTCAP	−0.07	−0.03	−0.07	−0.08	−0.16	−0.11	0.02	0.01	0.29	0.04	0.37			
LEV	−0.01	0.05	0.08	−0.10	0.07	0.12	−0.02	0.00	−0.47	−0.05	0.06	−0.14		
ROA	−0.16	−0.05	−0.07	−0.01	−0.41	−0.18	−0.06	−0.09	0.99	0.20	0.56	0.28	−0.48	
FIN	0.23	0.17	0.14	0.17	0.14	0.07	0.10	0.16	−0.01	0.05	0.04	0.16	−0.09	0.00
ADV	0.01	0.00	−0.03	−0.03	−0.03	−0.04	−0.01	−0.02	−0.22	−0.08	−0.12	0.06	0.13	−0.19
AGEXPENSE	0.12	0.12	0.17	0.24	0.05	0.08	−0.32	−0.07	−0.05	0.01	0.05	−0.25	0.11	−0.07
ASSETTO	−0.20	−0.19	−0.25	−0.28	0.04	0.03	0.33	−0.06	0.04	0.05	0.21	−0.06	0.12	0.02
LAGCOMMREPO	−0.33	−0.32	−0.31	−0.28	−0.11	−0.11	−0.08	−0.13	0.04	−0.08	−0.11	0.15	−0.04	0.05
ΔCOMMREPO	0.13	0.12	0.09	0.08	−0.07	0.06	−0.03	−0.07	0.07	0.16	0.09	0.08	−0.02	0.07
LOC	0.00	−0.02	0.01	−0.06	0.29	0.17	0.22	−0.01	−0.22	−0.14	−0.14	−0.01	0.13	−0.19
ΔASSETTO	0.23	0.17	0.15	0.16	0.12	0.12	0.08	0.10	−0.11	0.26	−0.09	−0.03	−0.11	−0.12
ΔPROFITMGN	−0.10	−0.03	−0.06	−0.04	−0.27	0.26	0.05	−0.32	0.27	0.90	0.19	0.07	−0.08	0.27
DUALITY	0.04	0.02	0.02	0.01	0.09	0.05	0.14	0.06	0.05	−0.04	0.05	−0.02	−0.09	0.07
SENORITY	0.04	0.08	0.07	0.02	0.06	−0.06	0.16	0.07	−0.11	−0.09	−0.04	−0.15	0.06	−0.08
CEOOWNERSHIP	−0.13	−0.09	−0.09	−0.08	−0.08	−0.09	0.00	−0.04	0.12	−0.05	0.08	−0.33	0.10	0.13
INDBOARD	−0.09	0.03	−0.03	−0.08	0.07	0.05	−0.02	−0.03	−0.13	−0.01	0.01	0.35	0.14	−0.15
BOARDSIZE	0.02	0.01	0.02	0.05	−0.13	−0.16	−0.08	−0.01	0.10	−0.05	0.08	0.27	0.05	0.09
INSTOWNERSHIP	−0.10	−0.03	−0.06	−0.10	−0.11	−0.06	−0.03	0.02	−0.09	0.04	0.02	0.55	−0.05	−0.09

Table 4 (continued)

Variables	FIN	ADV	AGEXPENSE	ASSETTO	LAGCOMMREPO	ΔCOMMREPO	LOC	ΔASSETTO	ΔPROFITMGN	DUALITY	SENORITY	CEOOWNERSHIP	INDBOARD	BOARDSIZE
ADV	0.18													
AGEXPENSE	0.04	0.33												
ASSETTO	0.00	0.00	−0.28											
LAGCOMMREPO	−0.17	0.23	−0.01	0.10										
ΔCOMMREPO	−0.06	−0.07	−0.04	−0.09	−0.29									
LOC	−0.03	0.27	0.04	−0.02	0.13	−0.03								
ΔASSETTO	0.03	−0.06	−0.10	0.18	0.01	−0.01	−0.06							
ΔPROFITMGN	0.05	−0.05	0.03	−0.02	−0.09	0.16	−0.11	0.04						
DUALITY	0.02	−0.14	0.00	0.05	0.01	0.03	0.05	0.05	−0.03					
SENORITY	−0.04	−0.04	−0.03	0.01	−0.11	0.02	0.08	−0.01	−0.07	0.21				
CEOOWNERSHIP	−0.13	0.09	0.21	0.21	0.15	−0.16	−0.03	−0.04	−0.08	0.07	0.08			
INDBOARD	0.21	0.02	−0.29	0.09	0.08	0.11	−0.03	0.05	−0.02	−0.09	−0.10	−0.31		
BOARDSIZE	0.22	0.19	0.10	−0.10	−0.12	0.01	−0.02	−0.06	−0.01	−0.10	−0.09	−0.11	0.27	
INSTOWNERSHIP	0.02	0.26	−0.04	−0.09	0.15	0.06	0.06	0.01	0.05	−0.06	−0.02	−0.33	0.23	0.11

This table presents the Spearman rank correlation coefficients of variables in our REIT sample. We include all REITs in the SNL database that have consecutive 3-year data on our regression variables from 2003 to 2009, and the lagged excess dividends variable in the year before the 3-year period. All continuous variables in the table are 3-year averages except PROP_IG, PROP_SFG, and PROP_SG. GROWTH is the percentage increase in sales. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the dividends distributed minus the 90 % of the pretax net income. MANDIVRATE is the mandatory dividends divided by total assets, and ΔMANDIVRATE is the change in mandatory dividends divided by total asset. EXFFO is the funds from operations divided by total asset. ΔEXFFO is the annual change in funds from operations less changes in dividends, scaled by current total assets. MKTCAP is the inflation adjusted market capitalization. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. LEV is the total debt divided by total assets. ROA is net income divided by total assets. FIN is the sum of public debt and equity issues dividend by total assets. ADV is a dummy variable that equals one if the firm is self advised. GAEX is the general and administrative expense over total asset. ASSETTO is sales over total assets. COMMREPO is common share repurchase dividend by total asset. ΔCOMMREPO is the annual change in common share repurchases divided by current total assets. LOC is the percentage of credit line usage. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. DUALITY dummy is 1 when the CEO is also the chairman, 0 otherwise. SENORITY dummy takes value 1 when the CEO has over 4 years of tenure, 0 otherwise. CEOOWNERSHIP is the percentage of shares held by the CEO. INDBOARD is the percentage of independent board members on the board. BOARDSIZE is the number of board members. INSTOWNERSHIP is the percentage of shares held by institution investors

Results and Analyses

Estimation of the Excess Dividends Model

In Table 5 we report two sets of results for four versions of excess dividend models. Pooled regressions are in Panel A and cross-sectional (between-estimator) regressions are in Panel B. We estimate Hardin and Hill's (2008) model in column (1), a modified version of Boudry's (2011) model in column (2), an autoregressive model in column (3), and, our excess dividend model in column (4).[19] Our model has the highest explanatory power, with an adjusted R-squared of 56.6 % in the pooled regression, and 59.3 % in the cross-sectional regression.

Table 5 demonstrates several important features of excess dividends. First, excess dividends are serially correlated. Under agency theory, excess dividends mitigate agency costs. But agency problems are related to firm characteristics such as managerial ownership and incentive compensation structures that change slowly. Therefore, conditional on financing needs, excess dividends are expected to be serially correlated as demonstrated in column (3) of both panels. The lagged excess dividends alone explain nearly a quarter of the variation in excess dividends. Second, consistent with Hardin and Hill's (2008) argument that excess cash flow has significant impact on excess dividends, lagged excess funds from operations is significant and positive. However, change in excess funds from operations loses explanatory power in column (4), likely due to difference of samples and the introduction of other variables. Third, coefficients of mandatory dividends and change in mandatory dividends are significantly negative, consistent with Boudry's (2011) results. Fourth, the coefficients of several proxies for agency costs are consistent with the notion that excess dividends mitigate agency problems. The internal advisement dummy (ADV) is negatively (albeit insignificant) associated with excess dividends, indicating that distributing dividends to alleviate principle-agent conflicts is not as critical in an internally advised REIT. As reported in Hardin and Hill (2008), credit line (LOC) is significantly and positively related to excess dividends. Payment of excess dividends attenuates information asymmetry and enhances transparency, which facilitates better access to the capital market and sources of short-term capital. Further, the availability of additional funds through lines of credit allows more dividend distribution. General and administrative expenses (GAEX) which indicate high agency costs is not significant. Asset turnover (ASSETTO) is negative and significant in panel A, confirming the decreasing need for excess dividends to mitigate agency costs for high efficiency firms. In sum, our excess dividends model captures several important aspects of how dividends are related to various firm fundamentals and characteristics, and has the strongest explanatory power among alternative models.

Estimation of the SEMs

Our main results are reported in Table 6. Panel A tabulates the pooled 2SLS coefficients of the growth equations with sales growth (GROWTH) and three measures

[19] Note we exclude ROA in models with mandatory dividend due to their high correlation as previously discussed.

of externally financed growth (PROP_IG, PROP_SFG, and PROP_SG) as the dependent variable with the fitted value of excess dividends (EXDIV) from column (4) of Table 5 as the independent variable of interest. We control for Tobin's Q, logarithm of market capitalization (SIZE), public debt and equity issuance (FIN), change in profit margin (ΔPROFITMGN), change in asset turnover (ΔASSETTO), and property type dummies (not reported for space considerations).

Column (1) reports the growth equation with excess dividends and property type dummies. The coefficient of excess dividends is positive and significant.[20] Although our hypothesis concerns only the externally financed growth, REIT growth is largely funded by external capital. Therefore, growth serves as a close proxy for externally financed growth. The positive sign persists in column (2), but its significance is subsumed by other control variables.[21] The positive signs in these regressions suggest that REITs are different from industrial firms, where growth and dividends are usually negatively correlated.

To test our hypothesis, we regress the externally financed growth measures with varying degree of funding constraints in the remaining columns. Columns (3) and (4) use the internally financed growth rate PROP_IG as the dependent variable. Columns (5) and (6) use the short-term financed growth PROP_SFG, and Columns (7) and (8) the sustainable growth rate PROP_SG. The coefficients of excess dividends are positive and significant at the 5 % level across all model specifications, indicating that high excess dividends is highly significant in explaining externally financed growth.[22] Since externally financed growth is achieved through raising external funds which bears financing costs induced by various aspects of agency problem, high externally financed growth is a reflection of low agency costs controlling for growth opportunities. This is the rationale behind the adoption of externally financed growth in Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006). Therefore, we conclude that excess dividends help to reduce agency costs and promote firm growth.

Several other control variables are worth mentioning. As expected, Tobin's Q is positively related to external growth. Firm size does not significantly impact externally financed growth. Change in asset turnover is positive and significant in all models, suggesting firms that are more efficient in generating sales from the existing asset base grow faster. This variable is also associated with lower agency costs as discussed in Ang et al. (2000). We suppress coefficients of all property type dummies, but it is noteworthy that several property type dummies are significant and positively

[20] Recall that the correlation coefficient between growth and excess dividends in Table 4 is an insignificant −0.02.

[21] We estimate Columns (1) and (2) with our unrestricted sample that does not average across years, and we find positive but insignificant coefficient on excess dividend in Column (1), and positive and significant coefficient on excess dividend in Column (2). This indicate the positive relation between excess dividends and firm sales growth is not the result of sample bias. The inconsistency in significance is most likely due to the noise introduced by internal financed growth.

[22] As we argued earlier, the effect of dividend payment is similar to that of bank lines of credit. Hardin and Wu note that bank loans offer efficient monitoring services and help young companies to build creditworthiness. As a young industry experiencing rapid growth, access to capital market may be constrained for REITs due to potential information asymmetry and agency conflicts. Bank loans provide effective certification and monitoring of REITs' acquisition strategies. This allows REITs to raise funds at lower cost which boosts investment. Riddiough and Wu (2009) also note the effectiveness of bank credit lines in enhancing investments.

Table 5 Estimation of the dividends equation

Variables	Panel A: pooled regression				Panel B: cross-sectional regression			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
INTERCEPT	0.022***	0.028***	0.002*	0.021***	0.022	0.035	0.003	0.012
	(3.163)	(4.201)	(1.796)	(3.161)	(0.924)	(1.382)	(1.157)	(0.523)
LAGEXDIV			0.406***	0.403***			0.481***	0.346**
			(7.827)	(6.289)			(3.438)	(2.371)
LAGEXFFO	0.146***	0.089*		0.068*	0.099	0.086		0.145*
	(3.143)	(1.950)		(1.865)	(0.757)	(0.721)		(1.708)
ΔEXFFO	0.168	−0.154		−0.062	0.631*	0.052		−0.054
	(1.578)	(−1.394)		(−0.538)	(1.776)	(0.109)		(−0.148)
MANDIVRATE		−0.525***		−0.362***		−0.742**		−0.500**
		(−8.011)		(−6.619)		(−2.283)		(−2.568)
ΔMANDIVRATE		−0.317***		−0.605***		−0.442		−0.770*
		(−3.136)		(−5.075)		(−0.685)		(−1.660)
Q	0.014***	0.023***		0.018***	0.015	0.036**		0.030**
	(4.004)	(6.166)		(4.653)	(1.604)	(2.352)		(2.305)
SIZE	−0.001***	−0.002***		−0.001***	−0.001	−0.002**		−0.001
	(−3.500)	(−4.417)		(−2.896)	(−1.427)	(−2.012)		(−0.894)
LEV	−0.020***	−0.030***		−0.023***	−0.019	−0.046		−0.031*
	(−3.006)	(−4.190)		(−3.786)	(−0.963)	(−1.552)		(−1.806)
ROA	−0.298***				−0.269**			
	(−6.282)				(−2.138)			
ADV	−0.003	−0.005*		−0.003	−0.002	−0.007		−0.003
	(−1.034)	(−1.827)		(−1.205)	(−0.327)	(−0.839)		(−0.378)

Table 5 (continued)

Variables	Panel A: pooled regression				Panel B: cross-sectional regression			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
LAGCOMMREPO	−0.144	−0.122		−0.022	−0.615	−0.414		−0.212
	(−1.618)	(−1.610)		(−0.310)	(−0.992)	(−0.939)		(−0.812)
ΔCOMMREPO	−0.232	−0.201		−0.177	−0.716	−0.908		−0.591
	(−1.119)	(−1.100)		(−1.253)	(−0.282)	(−0.422)		(−0.517)
LOC	0.020***	0.018***		0.012***	0.026***	0.022**		0.018**
	(7.597)	(7.215)		(4.499)	(2.775)	(2.571)		(2.551)
GAEX				0.013				0.043
				(0.686)				(0.801)
ASSETTO				−0.028**				−0.047
				(−2.059)				(−0.947)
ADJ R2	0.282	0.382	0.233	0.566	0.237	0.388	0.261	0.593
N	519	519	519	519	107	107	107	107

This table presents two sets of regression results of Hardin and Hill's (2008) excess dividends model in Column (1), a modified version of Boudry's (2011) model in Column (2), an autoregressive model in Column (3), and our excess dividends model of Eq. (1) in Column (4). Panel A uses the pooled regression of all firm-year, and Panel B uses the cross-sectional regressions. All continuous variables are 3-year averages except lagged EXDIV, which takes the value in the year before the 3 years. EXDIV is the dividends distributed minus the 90 % of the pretax net income. MANDIVRATE is the mandatory dividends divided by total assets, and ΔMANDIVRATE is the change in mandatory dividends divided by total asset. EXFFO is the funds from operations divided by total asset. ΔEXFFO is the annual change in funds from operations less changes in dividends, scaled by current total assets. SIZE is the logarithm of the inflation adjusted market capitalization. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. LEV is the total debt divided by total assets. ROA is net income divided by total assets. ADV is a dummy variable that equals one if the firm is self advised. GAEX is the general and administrative expense over total asset. ASSETTO is sales over total assets. COMMREPO is common share repurchase dividend by total asset. ΔCOMMREPO is the annual change in common share repurchases divided by current total assets. LOC is the percentage of credit line usage. RETAIL, OFFICE, INDUSTRIAL, SELFSTORAGE, HOTEL, OTHER are property focus type dummies but their coefficients are suppressed from the table. Heteroscedasticity and autocorrelation corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

Table 6 2SLS estimation of the sales growth equation

Variables	(1) GROWTH	(2) GROWTH	(3) PROP_IG	(4) PROP_IG	(5) PROP_SFG	(6) PROP_SFG	(7) PROP_SG	(8) PROP_SG
Panel A: pooled regressions								
INTERCEPT	0.029***	0.316**	0.600***	0.348*	0.577***	0.412**	0.350***	0.392
	(2.930)	(2.550)	(12.827)	(1.701)	(13.052)	(1.965)	(5.776)	(1.591)
EXDIV	2.002***	0.787	3.959***	4.266***	5.201***	5.393***	4.559***	4.867**
	(3.033)	(1.098)	(3.052)	(2.793)	(3.807)	(3.210)	(2.642)	(2.572)
Q		−0.066**		0.090		0.123*		0.115
		(−2.077)		(1.467)		(1.654)		(1.298)
SIZE		−0.014		0.010		0.001		−0.013
		(−1.640)		(0.683)		(0.065)		(−0.717)
FIN		0.427***		0.028		0.005		0.285*
		(3.442)		(0.217)		(0.033)		(1.693)
ΔPROFITMGN		−0.117		−0.021		−0.084		0.131
		(−1.134)		(−0.120)		(−0.476)		(0.745)
ΔASSETTO		3.300***		3.232***		2.558**		4.237***
		(4.911)		(2.946)		(2.211)		(3.533)
ADJ R2	0.051	0.158	0.062	0.078	0.064	0.074	0.088	0.110
N	519	519	519	519	519	519	519	519
Panel B: cross-sectional regressions								
INTERCEPT	0.041*	0.650**	0.606***	0.355	0.586***	0.451	0.400***	0.529
	(1.678)	(2.026)	(9.867)	(1.002)	(9.668)	(1.238)	(4.963)	(1.450)
EXDIV	3.103	1.354	6.021***	6.925**	6.863***	7.883***	6.794***	7.123***
	(1.103)	(0.670)	(3.108)	(2.479)	(2.940)	(2.638)	(3.062)	(3.068)

Table 6 (continued)

Variables	(1) GROWTH	(2) GROWTH	(3) PROP_IG	(4) PROP_IG	(5) PROP_SFG	(6) PROP_SFG	(7) PROP_SG	(8) PROP_SG
Q		−0.208*		−0.028		−0.045		−0.052
		(−1.945)		(−0.291)		(−0.395)		(−0.388)
SIZE		−0.026		0.021		0.015		−0.005
		(−1.207)		(0.829)		(0.563)		(−0.177)
FIN		0.828		−0.055		−0.230		0.321
		(1.503)		(−0.181)		(−0.609)		(0.762)
ΔPROFITMGN		0.830		0.390		0.418		0.671
		(1.272)		(0.349)		(0.405)		(1.084)
ΔASSETTO		7.569		3.594		3.592		5.288
		(1.336)		(0.933)		(0.732)		(1.389)
ADJ R2	−0.020	0.157	0.081	0.062	0.103	0.082	0.135	0.136
N	107	107	107	107	107	107	107	107

This table reports the pooled regression (Panel A) and cross-sectional (Panel B) results from the 2SLS growth equation with GROWTH, PROP_IG, PROP_SFG, and PROP_SG as the dependent variables. All continuous variables in this table are 3-year averages. GROWTH is the percentage increase in sales. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the instrumented excess dividends. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. SIZE is the logarithm of the inflation adjusted market capitalization. FIN is the sum of public debt and equity issues dividend by total assets. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. Coefficients of RETAIL, OFFICE, INDUSTRIAL, SELFSTORAGE, HOTEL, OTHER property focus type dummies are suppressed from the table. Heteroscedasticity and autocorrelation corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

related to REITs externally financed growth in conformity with the summary statistics in Table 2.

Panel B of Table 6 reports the estimation of the between-estimator model with cross-sectional averaging through all years in our sample. The fitted value of excess dividends is obtained from the dividends model in column (4) of panel B, Table 5. The 2SLS coefficients from the cross-sectional regressions are qualitatively similar to those from the pooled regressions. Excess dividends remain positive and highly significant in all models of externally financed growth measures at the 5 % significance level.

In sum, after taking into account the simultaneity between dividend policy and growth, we conclude that REITs that pay more excess dividends experience higher externally financed growth. Consistent with the notion that lower financing costs due to the reduction of agency costs by high dividends induce higher growth, this finding provides strong evidence that excess dividends help to promote externally financed growth, which supports with our hypothesis.

Growth Opportunities, External Capital Issuance and Dividends

The analysis in the previous section has established a significant and positive relation between externally financed growth and excess dividends. Following Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006), we attribute this result to the reduction of the cost of external capital via lower agency costs induced by high excess dividends. This positive relation should be stronger among REITs with access to more growth opportunities because these firms need to raise more capital to exercise their growth options. Growth of firms that raise external capital should also benefit the most from high excess dividends. Therefore, comparing the relation between excess dividends and externally financed growth among subsamples partitioned by growth opportunities and external capital raised may reveal further pertinent information for our hypothesis. The evidence will also help us discern if our results are driven by the signaling hypothesis of dividends, which implies that high dividends reflect high profitability, and, in turn, high growth in sales.

We first partition our sample into two groups of REITs based on median Tobin's Q to identify REITs with high and low growth opportunities, which in turn also indicate their dependence on external funds. This approach is similar to the classification scheme used in Khurana et al. (2006), and Korajczyk and Levy (2003).[23] We re-estimate the SEM of externally financed growth and excess dividends separately for high Q and low Q subsamples. Panel A of Table 7 reports these 2SLS regressions for different externally financed growth measures. If the agency theory is driving the positive relation between dividends and growth, we should observe greater sensitivity of externally financed growth to excess dividends when firms have more growth opportunities and greater need for external funds. If the signaling hypothesis is driving the results, we would expect no difference in the strength of the positive relation between excess dividends and externally financed growth between the high

[23] In addition to Q, Korajczyk and Levy (2003) also impose zero dividends in their classification scheme. Since internal funds account for a very small percentage of REITs' capital needs, we only use Q in our classification.

Table 7 Pooled estimation of sales growth equations: high and low Tobin's Q, public debt or equity issuers or non-issuers, and M&A acquirers or non-acquirers

Panel A: high vs. low Tobin's Q						
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	PROP_IG	PROP_IG	PROP_SFG	PROP_SFG	PROP_SG	PROP_SG
	HIGH Q	LOW Q	HIGH Q	LOW Q	HIGH Q	LOW Q
INTERCEPT	0.046	0.313	0.142	0.309	−0.035	0.268
	(0.128)	(1.335)	(0.374)	(1.466)	(−0.084)	(0.949)
EXDIV	5.979***	0.271	6.730***	2.554	6.977***	−0.786
	(3.935)	(0.125)	(3.908)	(1.101)	(4.301)	(−0.290)
Q	0.185**	0.488***	0.166*	0.615***	0.166	0.664***
	(2.099)	(3.937)	(1.701)	(4.028)	(1.498)	(4.062)
SIZE	0.019	−0.012	0.014	−0.027*	0.008	−0.040**
	(0.845)	(−0.795)	(0.587)	(−1.949)	(0.282)	(−2.070)
FIN	−0.080	0.105	−0.113	0.083	0.161	0.452**
	(−0.546)	(0.634)	(−0.593)	(0.473)	(0.653)	(2.278)
ΔPROFITMGN	−0.232	0.167	−0.214	0.012	0.209	−0.118
	(−1.391)	(0.830)	(−1.222)	(0.055)	(0.956)	(−0.428)
ΔASSETTO	2.528	4.737***	1.746	3.768**	3.412*	6.395***
	(1.355)	(3.334)	(0.912)	(2.346)	(1.785)	(3.995)
ADJ R2	0.084	0.176	0.049	0.172	0.093	0.159
N	260	259	260	259	260	259
Panel B: issuers vs. non-issuers						
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	PROP_IG	PROP_IG	PROP_SFG	PROP_SFG	PROP_SG	PROP_SG
	ISSUER	NON-ISS.	ISSUER	NON-ISS.	ISSUER	NON-ISS.
INTERCEPT	0.883***	−0.264	0.919***	−0.265	1.032***	−0.575*

Table 7 (continued)

	(3.606)	(−0.849)	(3.551)	(−0.816)	(3.240)	(−1.773)
EXDIV	5.225***	−0.083	7.719***	−1.289	6.341***	1.409
	(2.945)	(−0.037)	(4.222)	(−0.590)	(3.199)	(0.597)
Q	0.148**	0.052	0.148*	0.088	0.178*	0.062
	(2.183)	(0.634)	(1.864)	(1.032)	(1.815)	(0.572)
SIZE	−0.029	0.055**	−0.035*	0.051**	−0.069***	0.067***
	(−1.585)	(2.546)	(−1.940)	(2.253)	(−3.090)	(2.742)
ΔPROFITMGN	0.006	−0.326	−0.005	−0.476*	0.184	0.005
	(0.038)	(−1.233)	(−0.032)	(−1.702)	(0.897)	(0.019)
ΔASSETTO	2.322**	4.232**	1.479	2.853	3.478**	2.308
	(2.241)	(2.041)	(1.153)	(1.439)	(2.512)	(1.042)
ADJ R2	0.103	0.148	0.113	0.140	0.190	0.088
N	329	190	329	190	329	190
Panel C: acquirers vs. non-acquirers						
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	PROP_IG ACQUIRER	PROP_IG NON-ACQ.	PROP_SFG ACQUIRER	PROP_SFG NON-ACQ.	PROP_SG ACQUIRER	PROP_SG NON-ACQ.
INTERCEPT	0.889***	0.405	1.256***	0.376	0.749**	0.378
	(4.422)	(1.592)	(6.198)	(1.462)	(2.427)	(1.309)
EXDIV	3.863***	4.880***	3.114*	6.672***	6.132***	5.128***
	(3.161)	(2.953)	(1.894)	(3.765)	(3.041)	(2.768)
Q	0.128**	0.093	0.114**	0.144*	0.049	0.144
	(2.469)	(1.314)	(1.968)	(1.675)	(0.599)	(1.426)
SIZE	−0.013	0.004	−0.040***	0.000	−0.042**	−0.014
	(−0.876)	(0.228)	(−2.948)	(−0.003)	(−1.997)	(−0.628)
FIN	0.058	−0.157	0.228	−0.273	0.718***	−0.040

Table 7 (continued)

	(0.594)	(−0.957)	(1.579)	(−1.430)	(3.264)	(−0.180)
ΔPROFITMGN	0.431**	0.003	0.170	−0.025	−0.194	0.280
	(2.181)	(0.018)	(0.876)	(−0.131)	(−0.674)	(1.451)
ΔASSETTO	2.405**	3.737***	4.632***	2.236*	7.250***	3.247**
	(2.068)	(3.140)	(2.710)	(1.821)	(4.883)	(2.220)
ADJ R2	0.060	0.038	0.082	0.051	0.274	0.068
N	232	287	232	287	232	287

This table reports the pooled regression results from the 2SLS growth equation with PROP_IG, PROP_SFG, and PROP_SG as the dependent variables on subsamples partitioned by Tobin's Q (Panel A), issuing public funds (Panel B), and being an acquirer (Panel C). All continuous variables in this table are 3-year averages. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the instrumented excess dividends. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. SIZE is the logarithm of the inflation adjusted market capitalization. FIN is the sum of public debt and equity issues dividend by total assets. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. property focus type dummies RETAIL, OFFICE, INDUSTRIAL, SELFSTORAGE, HOTEL, OTHER are suppressed from this table but included in the regressions. Heteroscedasticity and autocorrelation corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

and low Q samples, because signaling is unconditional. Comparing the regression estimates for high Q and low Q REITs, we find that the coefficients on excess dividends in the high Q group are much larger in magnitude and significance than those of the low Q sample firms. These results suggest that REITs manage dividend policy to mitigate agency costs to facilitate access to low cost external funds when they have more growth opportunities, which is consistent with our hypothesis and Hardin and Hill's (2008) conclusion.[24]

To further address the concern that dividends signal high past growth, we partition the sample by lagged growth rate into high past growth and low past growth subsamples, and repeat the above analysis. In unreported results, we find the positive relation between excess dividends and externally financed growth is marginally stronger in the low past growth subsample, but not significantly different from that of the high growth subsample. This indicates that past high growth is not the driver of our finding.

To verify if our findings are indeed related to raising external capital, we repeat the previous analysis for subsamples of REITs partitioned by whether they issue new equity and debt or not. We collect data from Thomson ONE Banker on issuances of either debt or equity or both by REITs over our study period, and obtain 329 firm-year issuers, and 190 non-issuers. We estimate the 2SLS coefficients for externally financed growth in these two groups separately. The results are presented in panel B of Table 7. The coefficient for EXDIV for non-issuers is insignificant for all three measures of externally financed growth. In contrast, the coefficient for EXDIV for the issuing group is significantly positive for all measures of externally financed growth, and the difference between the coefficients on EXDIV between issuing and non-issuing REITs is large. In conjunction with the results from subsamples partitioned on Tobin's Q, this finding indicates that REITs that raise more external capital distribute more excess dividends to reduce the cost of external funds.

M&A and the Dividend Effect on Growth

Increased activity in mergers and acquisitions may induce high growth in sales and operations. High dividend payout can be a tactic employed by managers involved in M&A transactions. High dividends raise stock prices which makes equity a cheap method of payment in an M&A deal. As such, a positive relation between excess dividends and growth may be a by-product of M&As. We obtain information on REIT M&A transactions from Thomson ONE Banker. We require an M&A to be completed, with more than 50 % of the target shares acquired in the transaction. Further, the relative deal size must be at least 1 % of the acquirer's total assets as of the year before the transaction. For our sample of REITs, we find 232 firm-year M&A observations that satisfy these criteria (multiple M&As in a single year are counted as one observation); the M&A-free subsample contains 287 firm-year observations. We report the 2SLS coefficients of excess dividends for acquirers and non-acquirers

[24] If we interpret Q as proxy for information asymmetry, our test also explains the positive relation between excess dividends and growth is not driven by reduction in asymmetric information (e.g., Lee et al. 2010). If that is the case, the positive relation should hold for both high and low Q subsamples.

separately in panel C of Table 7. The coefficient on EXDIV for all three externally financed growth measures as the dependent variable are positive for both the acquiring and non-acquiring REITs, and the difference between the coefficients is not significant. These results suggest that the positive correlation between excess dividends and externally financed growth is not related to M&A activity in our sample of REITs.

Managerial Entrenchment and Institutional Ownership

Ghosh and Sirmans (2006) find that REITs' dividend decisions are influenced by managerial incentives. To protect their position, entrenched CEOs are inclined to pay more dividends to appease shareholders. But a vigilant board can provide a high level of monitoring and reduce the need to distribute more dividends. A high level of CEO ownership also mitigates the need for higher dividends because shareholders' interests are aligned with the CEO's. To examine if our results are robust to the influence of managerial incentive on dividend policy, we collect data on CEO ownership, board size, percentage of independent directors on the board, CEO duality and seniority from SNL Annual Handbooks. Under the premise that excess dividends substitute for governance mechanisms, the impact of CEO ownership, and percentage of independent directors are predicted to be negative, while CEO duality should be positive. The evidence on the effect of board size is mixed. If large boards are less effective due to lack of coordination, we expect a positive coefficient; conversely, large boards may provide better leadership in more complex organizations. Due to data limitation, the sample is reduced to 325 observations. We include these variables in the dividend model, and re-estimate the SEM.[25] The results are reported in Table 8. In panel A, the explanatory power of the dividend equation increases to 61 %. Among the variables we add, only board size significantly affects excess dividend payments. The negative coefficient is in the direction predicted by Ghosh and Sirmans (2006) and suggests that large boards are more conducive to better governance in REITs. In panel B, we report the coefficients of the model for externally financed growth, while including excess dividends adjusted for managerial entrenchment. Excess dividends remain positive and statistically significant, all other previous findings remain unaltered.

Several extant studies observe that dividend clienteles affect dividend decisions (Brennan and Thakor 1990; Allen et al. 2000).[26] In addition to the clientele effect, institutions can also serve as external monitors, which would reduce agency conflicts between REIT management and shareholders. We collect data on institutional ownership from SNL Annual Handbooks, and our sample size reduces to 472 observations. The results are reported in Table 9. In the dividend equation in panel A, institutional ownership significantly reduces the level of excess dividends. This is indicative of the monitoring effect of institutions. The relation between excess dividends and externally financed growth remains intact as shown in panel B. Since institutional investors can also provide external funds to facilitate growth, in

[25] We also include the square of CEO ownership to account for the nonlinear effect of CEO ownership on dividends.

[26] We thank the editor for suggesting this test.

Table 8 Dividend and sales growth 2SLS regressions with managerial incentives

Panel A: dividend equation		Panel B: pooled 2SLS growth equation						
Variables		Variables	(1)	(2)	(3)	(4)	(5)	(6)
INTERCEPT	0.024**	INTERCEPT	0.601***	0.240	0.576***	0.293	0.339***	0.445*
	(2.224)		(10.231)	(1.188)	(10.282)	(1.366)	(4.836)	(1.734)
LAGEXDIV	0.368***	EXDIV	3.917***	5.101***	5.731***	6.688***	5.822***	5.905***
	(3.574)		(2.689)	(3.129)	(3.872)	(3.673)	(3.616)	(3.441)
LAGEXFFO	0.017	Q		0.229***		0.243***		0.232**
	(0.278)			(3.902)		(2.931)		(2.410)
ΔEXFFO	−0.197	SIZE		0.005		−0.002		−0.028
	(−1.241)			(0.341)		(−0.149)		(−1.484)
MANDIVRATE	−0.341***	FIN		0.068		0.010		0.316
	(−4.701)			(0.458)		(0.052)		(1.453)
ΔMANDIVRATE	−0.733***	ΔPROFITMGN		0.146		0.039		−0.058
	(−4.336)			(0.718)		(0.190)		(−0.252)
Q	0.022***	ΔASSETTO		7.406***		6.514***		6.969***
	(3.899)			(6.559)		(5.408)		(5.161)
SIZE	−0.002***	ADJ R2	0.09	0.18	0.10	0.17	0.11	0.16
	(−3.482)	N	325	325	325	325	325	325
LEV	−0.019***							
	(−2.623)							
ADV	0.008							
	(1.266)							
LAGCOMMREPO	−0.019							
	(−0.181)							
ΔCOMMREPO	−0.190							
	(−1.117)							
LOC	0.016***							
	(3.989)							

Table 8 (continued)

Panel A: dividend equation		Panel B: pooled 2SLS growth equation						
Variables		Variables	(1)	(2)	(3)	(4)	(5)	(6)
GAEX	0.021							
	(0.888)							
ASSETTO	−0.038**							
	(−2.277)							
CEOOWNERSHIP	−0.031							
	(−0.860)							
CEOOWNERSHIPSQR	0.066							
	(0.750)							
DUALITY	0.001							
	(0.986)							
SENORITY	−0.001							
	(−0.449)							
INDBOARD	−0.002							
	(−0.640)							
BOARDSIZE	−0.001**							
	(−2.051)							
AdjRsq	0.61							
N	325							

This table reports the regression of the dividend equation controlling for managerial incentive variables (Panel A) and second stage pooled regression results from the 2SLS growth equation with PROP_IG, PROP_SFG, and PROP_SG as the dependent variables (Panel B). All continuous variables in this table are 3-year averages. GROWTH is the percentage increase in sales. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the instrumented excess dividends. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. SIZE is the logarithm of the inflation adjusted market capitalization. FIN is the sum of public debt and equity issues dividend by total assets. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. DUALITY dummy is 1 when the CEO is also the chairman, 0 otherwise. SENORITY dummy takes value 1 when the CEO has over 4 years of tenure, 0 otherwise. CEOOWNERSHIP is the percentage of shares held by the CEO. INDBOARD is the percentage of independent board members on the board. BOARDSIZE is the number of board members. RETAIL, OFFICE, INDUSTRIAL, SELFSTORAGE, HOTEL, OTHER are property focus type dummies, but their coefficients are suppressed from the table. Heteroscedasticity and autocorrelation corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

Table 9 Dividend and sales growth 2SLS regressions with institution ownership

Panel A: dividend equation		Panel B: pooled 2SLS growth equation						
Variables		Variables	(1)	(2)	(3)	(4)	(5)	(6)
INTERCEPT	0.019**	INTERCEPT	0.619***	0.195	0.596***	0.239	0.369***	0.325
	(2.494)		(13.997)	(0.852)	(14.244)	(1.017)	(5.922)	(1.190)
LAGEXDIV	0.382***	EXDIV	4.798***	5.232***	5.935***	6.315***	4.498**	4.498**
	(5.532)		(3.809)	(3.452)	(4.453)	(3.876)	(2.558)	(2.247)
LAGEXFFO	0.056	Q		0.093		0.118		0.148
	(1.495)			(1.417)		(1.513)		(1.636)
ΔEXFFO	−0.079	SIZE		0.022		0.015		−0.010
	(−0.680)			(1.307)		(0.889)		(−0.468)
MANDIVRATE	−0.383***	FIN		0.052		0.031		0.308*
	(−6.521)			(0.417)		(0.222)		(1.874)
ΔMANDIVRATE	−0.585***	ΔPROFITMGN		−0.030		−0.074		0.034
	(−4.678)			(−0.171)		(−0.419)		(0.182)
Q	0.018***	ΔASSETTO		3.075***		2.066*		4.671***
	(4.382)			(2.616)		(1.669)		(3.499)
SIZE	−0.001	ADJ R2	0.06	0.08	0.08	0.09	0.09	0.12
	(−1.425)	N	472	472	472	472	472	472
LEV	−0.025***							
	(−3.688)							
ADV	−0.003							
	(−1.062)							
LAGCOMMREPO	−0.014							
	(−0.190)							

Table 9 (continued)

Panel A: dividend equation		Panel B: pooled 2SLS growth equation						
Variables		Variables	(1)	(2)	(3)	(4)	(5)	(6)
ΔCOMMREPO	−0.255*							
	(−1.732)							
LOC	0.014***							
	(4.485)							
GAEX	0.018							
	(0.914)							
ASSETTO	−0.025							
	(−1.573)							
INSTOWNERSHIP	−0.004**							
	(−2.217)							
AdjRsq	0.573							
N	472							

This table reports the regression of the dividend equation controlling for institution ownership (Panel A) and second stage pooled regression results from the 2SLS growth equation with PROP_IG, PROP_SFG, and PROP_SG as the dependent variables (Panel B). All continuous variables in this table are 3-year averages. GROWTH is the percentage increase in sales. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm growth rate exceeds the relevant benchmark growth rates. EXDIV is the instrumented excess dividends. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. SIZE is the logarithm of the inflation adjusted market capitalization. FIN is the sum of public debt and equity issues dividend by total assets. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. INSTOWNERSHIP is the percentage of shares held by institution investors. RETAIL, OFFICE, INDUSTRIAL, SELFSTORAGE, HOTEL, OTHER are property focus type dummies, but their coefficients are suppressed from the table. Heteroscedasticity and autocorrelation corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

untabulated results, we consider if our results are robust to the inclusion of the percentage of shares owned by institutions in the growth equation. Institutional ownership has no impact on externally financed growth.[27]

Excess Dividends and Asset Growth

Our analyses so far are based on growth in sales. Sales growth may not be driven by investments alone, however. In this section, we test if our results are robust to specifying growth as growth in assets. Asset growth is more tied to capital investment, and therefore can more closely reflect the need and availability of external funds. Following Cooper et al. (2008), we define asset growth as the percentage change in total assets. We recalculate PROP_IG, PROG_SFG, and PROP_SG with asset growth, such that this set of externally financed growth variables are closely related to capital investment. We reestimate the models in Tables 6 with asset growth as the dependent variable, and report the results in Table 10. For both pooled and cross-sectional 2SLS regressions, the coefficients on EXDIV are positive and significant for all model specifications, regardless of the choice of externally financed asset growth measures. These results corroborate that the effect of excess dividends on growth is related to REIT investment.

Excess Dividends and Changes in Growth

Is the relation between the level of externally financed growth and excess dividends driven by spurious correlations? To address this possibility, we follow Khurana et al. (2006) to measure the change in externally financed growth, and compute the change in excess dividends in a similar manner. We test if significant increase in excess dividends drive externally financed growth. Specifically, we take firm-year observations with above median increase in excess dividends, and examine the relation between increase in excess dividends and change in externally financed growth. The regression model takes the first-order difference of PROP_EFG, EXDIV, Q and SIZE of Eq. (2),

$$\Delta\text{PROP\_EFG}_t = \gamma_0 + \gamma_1 \Delta\text{EXDIV}_t + \gamma_2 \Delta\text{Q}_t + \gamma_3 \Delta\text{SIZE}_t + \gamma_4 \text{FIN}_t + \gamma_5 \Delta\text{PROFITMGN}_t + \gamma_6 \Delta\text{ASSETTO}_t + \gamma_7 \text{TYPE}_t + \xi_t. \quad (3)$$

The change operator (Δ) indicates time-series difference. The regression results are reported in Table 11. With ΔPROP_IG as the dependent variable, the coefficient on ΔEXDIV is not significant without control variables (Column 1), and marginally significant after adding other firm fundamentals and characteristics (Column 2). In Column (3), the significance of EXDIV increases with ΔPROP_SFG as the dependent variable, and becomes significant at the 5 % level with other control variables (Column 4). With ΔPROP_SG as the dependent variable, ΔEXDIV is highly significant in both model specifications. Overall, these results complement our models with

[27] Similar to these tests, in unreported results, we also test the life-cycle theory of DeAngelo et al. (2006) by adding retained earnings in our dividend equation, but find no change to our results.

Table 10 Pooled estimation of asset growth equations

Variables	(1) GROWTH	(2) GROWTH	(3) PROP_IG	(4) PROP_IG	(5) PROP_SFG	(6) PROP_SFG	(7) PROP_SG	(8) PROP_SG
Panel A: pooled regressions								
INTERCEPT	0.048***	0.296**	0.614***	0.298	0.572***	0.272	0.439***	0.439*
	(3.743)	(2.466)	(10.911)	(1.401)	(10.079)	(1.278)	(7.826)	(1.953)
EXDIV	1.904***	1.132*	4.745***	5.592***	6.334***	6.804***	4.550***	4.698***
	(2.789)	(1.750)	(3.122)	(3.445)	(4.061)	(4.080)	(2.750)	(2.684)
Q		−0.038		0.026		0.063		0.056
		(−1.174)		(0.364)		(0.849)		(0.703)
SIZE		−0.015*		0.018		0.014		−0.007
		(−1.736)		(1.151)		(0.904)		(−0.391)
FIN		0.321***		0.149		0.187		0.378**
		(3.470)		(0.891)		(1.091)		(2.281)
ΔPROFITMGN		−0.107		−0.081		−0.148		−0.068
		(−1.087)		(−0.412)		(−0.785)		(−0.356)
ΔASSETTO		−4.796***		−8.102***		−7.765***		−5.860***
		(−7.461)		(−7.477)		(−7.240)		(−5.306)
ADJ R2	0.008	0.178	0.016	0.094	0.018	0.095	0.062	0.114
N	519	519	519	519	519	519	519	519
Panel B: cross-sectional regressions								
INTERCEPT	0.060**	0.463**	0.601***	0.384	0.545***	0.460	0.447***	0.685**
	(2.160)	(2.148)	(9.006)	(1.136)	(8.166)	(1.388)	(6.122)	(2.037)
EXDIV	2.046	1.047	5.169**	5.909*	6.667***	7.544***	6.682***	7.309***
	(1.253)	(0.728)	(2.249)	(1.810)	(3.061)	(2.707)	(2.818)	(3.007)

Table 10 (continued)

Variables	(1) GROWTH	(2) GROWTH	(3) PROP_IG	(4) PROP_IG	(5) PROP_SFG	(6) PROP_SFG	(7) PROP_SG	(8) PROP_SG
Q		−0.134*		−0.104		−0.160		−0.153
		(−1.958)		(−0.854)		(−1.297)		(−1.269)
SIZE		−0.018		0.024		0.019		−0.005
		(−1.228)		(0.959)		(0.809)		(−0.195)
FIN		0.632*		0.363		0.296		0.341
		(1.785)		(1.164)		(0.950)		(1.002)
ΔPROFITMGN		0.446		0.777		0.970		0.767
		(0.969)		(0.869)		(1.264)		(0.950)
ΔASSETTO		−1.415		−8.808		−10.218**		−7.840**
		(−0.392)		(−1.536)		(−2.047)		(−2.020)
ADJ R2	−0.041	0.143	0.000	0.082	0.045	0.149	0.114	0.166
N	107	107	107	107	107	107	107	107

This table reports the pooled regression results from the 2SLS growth equation with GROWTH, PROP_IG, PROP_SFG, and PROP_SG as the dependent variables. All continuous variables in this table are 3-year averages. GROWTH is the percentage increase in total assets. PROP_IG, PROP_SFG, and PROP_SG are the proportion of years firm asset growth rate exceeds the relevant benchmark growth rates. EXDIV is the instrumented excess dividends. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. SIZE is the logarithm of the inflation adjusted market capitalization. FIN is the sum of public debt and equity issues dividend by total assets. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. RETAIL, OFFICE, INDUSTRIAL, SELFSTORAGE, HOTEL, OTHER are property focus type dummies. Heteroscedasticity and autocorrelation corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

Table 11 Pooled estimation of sales growth changes

Variables	(1) ΔPROP_IG	(2) ΔPROP_IG	(3) ΔPROP_SFG	(4) ΔPROP_SFG	(5) ΔPROP_SG	(6) ΔPROP_SG
INTERCEPT	−0.114	−0.119	−0.073	−0.081	−0.018	−0.023
	(−1.191)	(−1.259)	(−0.752)	(−0.837)	(−0.167)	(−0.203)
ΔEXDIV	2.529	4.072*	4.283*	5.262**	8.615***	9.749***
	(1.058)	(1.848)	(1.908)	(2.423)	(3.379)	(3.256)
ΔQ		0.247		0.144		0.224
		(1.150)		(0.654)		(1.053)
ΔSIZE		0.119		0.131		0.150
		(1.072)		(1.066)		(1.148)
FIN		0.246		0.187		−0.093
		(1.435)		(1.030)		(−0.481)
ΔPROFITMGN		0.065		0.053		0.017
		(0.428)		(0.342)		(0.109)
ΔASSETTO		−1.158		−1.787		−2.169*
		(−1.074)		(−1.549)		(−1.880)
ADJ R2	−0.027	0.036	−0.001	0.062	0.064	0.101
N	159	159	159	159	159	159

This table reports the pooled regression results of the growth change model in Equation (7) with REITs with above median ΔEXDIV. ΔPROP_IG, ΔPROP_SFG, and ΔPROP_SG as the dependent variables. ΔPROP_IG, ΔPROP_SFG, and ΔPROP_SG are the increase in proportion of years firm growth rate exceeds the relevant benchmark growth rates. ΔEXDIV is the increase in excess dividends. ΔQ is the change in Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. ΔSIZE is the change in logarithm of the inflation adjusted market capitalization. FIN is the sum of public debt and equity issues dividend by total assets. ΔASSETTO is the annual change in total revenue divided by total assets. ΔPROFITMGN is the annual change in net income divided by total revenue. Coefficients of RETAIL, OFFICE, INDUSTRIAL, SELFSTORAGE, HOTEL, OTHER property focus type dummies are suppressed. Heteroscedasticity corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

levels, and show that large excess dividends augment REITs' access to external funds and thereby enhance externally financed growth.

Excess Dividends and Cost of Capital

The above analyses focus on externally financed growth as defined by Demirgüç-Kunt and Maksimovic (1998) to test the efficacy of excess dividends in mitigating agency conflicts and enabling REITs to achieve higher growth. Further tests lead to rejection of signaling as a catalyst for the boost in growth. Is the growth achieved via lower cost of external funds as implied by agency theory? For proper perspective and motivation on this notion, we turn to several recent studies in corporate finance that focus on the effect of agency conflicts and governance mechanisms on the cost of external capital. Most of these studies measure agency costs by the number of

antitakeover provisions in place in individual firms–the idea being that the greater is the protection against hostile takeovers, the weaker are shareholder rights, and the greater is the agency cost. This notion was first presented in a seminal study by Gompers et al. (2003) who establish that in firms with weak shareholder rights–indicated by high value of a governance index that reflects the incidence of antitakeover provisions at the individual firm level–Tobin's Q is significantly lower than in firms with strong shareholder rights. Chen et al. (2011) provide direct evidence of a significantly positive relation between antitakeover provisions and the implied cost of equity capital and find the effect to be stronger in firms with higher agency costs associated with free cash flow. In contrast, Klock et al. (2005) report a statistically negative and significant relation between the governance index and the cost of debt financing. They interpret this evidence to suggest that firms with corporate governance provisions that favor shareholder interests over management interests are viewed unfavorably in the debt market. In corroboration, Cremers and Nair (2005) find that stronger shareholder control is associated with higher bond yields, lower ratings, and higher returns for bonds only if takeover vulnerability is high. Finally, Chava et al. (2009) construct portfolios of firms with the highest (democracy) and the lowest (dictatorship) levels of shareholder rights, and show that a switch from the democracy to the dictatorship portfolio decreases a firm's expected bank loan spread by a significant 25 %. Conceivably, creditors charge a higher spread to these borrowers mainly because of their concern about an increase in financial risk of the borrowers consequent to takeovers. Overall, the evidence on the impact of agency costs and governance mechanisms on cost of capital is compelling and implies that it is important to consider the total effect of governance terms and not merely the impact on stockholders.

In keeping with the broad corporate literature, researchers have investigated the impact of corporate governance on the value of REITs. Bauer et al. (2010) find a strong and significantly positive relation between a governance index and several performance variables for REITs. Bianco et al. (2007) find that protective barriers have a significantly negative effect on the value of REITs. The evidence on the impact of governance structure and security holders' protection on the cost of capital of REITs is sparse, however. Two recent studies (Highfield et al. (2007), and Riddiough and Wu (2009)) have some bearing on this issue. Highfield et al. (2007) invoke Myers' (1977) argument that shareholder value-maximizing managers in levered firms may forego profitable investments to prevent potential benefits from accruing to bondholders. Bondholders anticipate such behavior and demand greater yield of firms with growth options. One way to mitigate the problem is to issue short term debt because frequent visits to the market to refinance and renegotiate the debt may alleviate the underinvestment problem. In conformity with this view, Highfield et al. (2007) find that REITs with more growth options tend to issue more short maturity debt. Riddiough and Wu (2009) investigate the puzzle that despite regulatory constraints on cash flow retention, REITs' rate of investment has historically exceeded that of non-REIT firms. The authors find that REITs do not change dividend levels in tune with the need for investment funds, but use bank lines of credit in the short run. This is a rational choice from the agency theory perspective. Payment of dividends enhances information transmission and attenuates the potential wastage of free cash flow, while bank lines of

credit provide efficient monitoring services at a lower cost than other sources of funds.

Against this background, our analyses on whether high excess dividends indeed induce lower cost of capital in REITs fills an important void in the literature. As noted earlier, proxies for cost of capital are subject to measurement errors, and may fail to incorporate the various sources of agency problems. However, as observed by several previous authors, if the regulatory structure of REITs enhances transparency and mitigates agency costs due to adverse selection and moral hazard, a confirmative direct test of the impact of excess dividends on cost of external capital will reaffirm our main conclusions. In the tests below, we estimate cost of equity and bond yield spread as functions of excess dividends. We jointly estimate the excess dividend model in Eq. (1) with the external financing costs equations below:

$$\mathrm{COSTOFEQ_t} = \varphi_0 + \varphi_1 \mathrm{EXDIV_t} + \varphi_2 \mathrm{Q_t} + \varphi_3 \mathrm{SIZE_t} + \varphi_4 \mathrm{LEV_t} + \varphi_5 \mathrm{TYPE_t} + \xi_t \tag{4}$$

$$\mathrm{BONDSPREAD_t} = \psi_0 + \psi_1 \mathrm{EXDIV_t} + \psi_2 \mathrm{Q_t} + \psi_3 \mathrm{SIZE_t} + \psi_4 \mathrm{LEV_t} + \psi_5 \mathrm{ROA_t} + \psi_6 \mathrm{TYPE_t} + \theta_t. \tag{5}$$

We estimate COSTOFEQ by Fama and French Three Factor Model (Fama and French (1993), (1997)).[28, 29] COSTOFEQ ranges from −0.119 to 0.362, with a mean of 0.091. The mean COSTOFEQ is 0.091 in the high excess dividends subsample, and 0.095 in the low excess dividends subsample. The difference of 0.004 is insignificant. When partitioned by growth, high growth REITs have an average COSTOFEQ of 0.086, compared with a significantly different 0.098 for low growth REITs.

In Eq. (4), excess dividends reduce agency costs, and hence cost of equity in three different ways–disseminate information, reduce managers' access to free cash flow, and force firms to raise funds from the market, exposing them to the disciplining forces of the market. Accordingly, the coefficient of EXDIV is expected to be negative. Tobin's Q is included as a proxy for growth opportunities, and expected to be positively related to cost of equity because growth options are riskier. Firm size should be negatively related to cost of equity as larger firms usually have more stable performance. High leverage increases cost of equity, so the coefficient of LEV should be positive. Estimation results for Eq. (4) are reported in columns (1) an (2) in Table 12. In corroboration of the evidence for unregulated firms (Gompers et al. (2003), Chen et al. (2011)), the coefficients of excess dividends are significant and

[28] More specifically, for firm *i* in year*t*, we first regression firm *i*'s monthly returns in years*t*-5 to *t*-1 on corresponding Fama and French three factors from Ken French's website. We require firm *i* to have at least 24 valid monthly returns for the regression. Then we multiply these coefficients with the monthly factor returns in year*t* to obtain the monthly cost of equity. The cost of equity in year*t* is the average of the monthly cost of equity in year*t* times 12, similar to Fama and French (1997). The return data are from CRSP, and the Fama and French factor data are from Ken French's website.

[29] It is also common to use market beta as proxies for cost of equity. However, REITs tend to be smaller in size and their valuation method differs from other industrial firms. Therefore, it is necessary to control for these firm characteristics when estimating REITs cost of equity.

Table 12 Pooled 2SLS estimation of cost of equity and new bond yield spread

Variables	(1) COSTOFEQ	(2) COSTOFEQ	(3) BONDSPREAD	(4) BONDSPREAD
INTERCEPT	0.103***	−0.047	1.492***	19.685***
	(15.577)	(−1.000)	(7.861)	(9.195)
EXDIV	−0.634**	−0.570*	−3.461	−30.902***
	(−2.081)	(−1.912)	(−0.503)	(−5.364)
Q		−0.011		−1.018***
		(−0.889)		(−2.857)
SIZE		0.009***		−1.058***
		(2.965)		(−6.996)
LEV		0.055**		−1.057
		(2.249)		(−1.327)
ROA				−22.888***
				(−3.755)
ADJ R2	0.059	0.092	0.139	0.501
N	475	475	100	100

This table reports the 2SLS pooled regression results of the newly issued bond yield spread and beta on instrumented excess dividends and other firm characteristics. All continuous variables are 3-year averages. EXDIV is the dividends distributed minus the 90 % of the pretax net income. SIZE is the logarithm of the inflation adjusted market capitalization. Q is the Tobin's Q measured as market equity plus total debt and preferred equity, dividend by total assets. LEV is the total debt divided by total assets. LOC is the percentage of credit line usage. ROA is net income divided by total assets. Property focus type dummies RETAIL, OFFICE, INDUSTRIAL, HOTEL, OTHER are suppressed from the table. Heteroscedasticity corrected t-statistics are reported in parenthesis below the coefficients. Coefficients significant at levels of 0.1, 0.05, and 0.01 are marked with *, **, and *** respectively

negative, which is consistent with the notion that excess dividends help to reduce the cost of external capital. The coefficient of Tobin's Q is negative but insignificant. The positive coefficient of SIZE is puzzling, which is probably a special feature of REITs as our growth regressions in previous tables often report a negative relation between size and growth. Highly levered REITs have significantly higher cost of equity, as high level of debt is related to higher bankruptcy risk.

To estimate Eq. (5), we measure cost of debt by newly issued bond yield spread (BONDSPREAD), which is the difference in yield between a REIT bond and a duration-matched treasury bond. We obtain this data from Thomson ONE Banker, and we are only able to find 100 firm-year observations for BONDSPREAD (multiple issuances in a year are combined). The average bond yield spread is 2 %, with a range of 0.89 % to 10.5 %. Average bond yield spread is lower in the high growth REIT subsample but higher in the high excess dividends subsample, albeit insignificant.

The results of estimation of Eq. (5) are reported in columns (3) and (4) of Table 12. The potential reduction of agency costs by dividend payments implies a negative coefficient for EXDIV. Tobin's Q and ROA are expected to be negatively correlated with cost of debt because high future cash flow benefits bond holders. SIZE should

also be negative as larger firms have more collateral for debt. LEV should be positively related to cost of debt. In column (3), excess dividend is negatively but insignificantly related to newly issued bond yield spread, which is consistent with the notion that excess dividends reduce the cost of raising debt. After controlling for firm characteristics that affect the risk of bonds in column (4), the coefficient of excess dividends turns significantly negative, as predicted by the agency cost theory. The signs of Q, SIZE and ROA are as expected. The sign of the coefficient of LEV is not consistent with expectation, but it is not significant.

The negative relation between dividends and cost of debt in our data is not without contention. Recall the negative relation between antitakeover provisions and cost of debt documented in extant literature–the implication being that weak protection against takeovers (equivalently, strong shareholder rights) increases financial risk of bondholders. If dividend payments transfer wealth from bondholders to shareholders, dividend payments would increase the risk of bondholders, and the cost of debt. In a similar vein, dividend payments force cash-constrained firms to raise capital from the market, subjecting them to scrutiny and monitoring by market participants (e.g. large institutional holders, and analysts). To the extent dividends make managers vulnerable to capital market forces, dividends may increase risk of bondholders. On the other hand, by reducing availability of cash flow, and the potential expropriation of funds by the firm's managers, dividend distribution benefits both bondholders and shareholders. Our data indicate that the cash flow effect dominates. To reconcile the apparently contrasting findings for REITs and unregulated firms, we note two unique aspects of the REIT sector. First, REITs must raise funds from the market frequently so it is important to build security-holders' confidence that management will not expropriate the funds for personal benefits. Second, since hostile takeover are rare among REITs (Campbell et al. (2001)), the market for corporate control has but little disciplining effect on managerial behavior.

In sum, consistent with the implications of agency theory, we find that high excess dividends are associated with lower cost of equity and debt. This finding confirms that our previous results are driven by attenuation of agency costs via dividend payments.

Conclusion

Extant research has reported less than convincing evidence for the agency theory of dividends. The theory asserts that high dividends mitigate agency conflicts by reducing managers' control over cash flow, and subjecting firms to the disciplinary forces of the capital market by forcing external fund raising. We provide new evidence for the theory by showing that high dividends are associated with high growth in the REIT industry. Due to the mandatory high dividend distribution, REITs are unique in their dependence on external financing to sustain growth; therefore, the cost of external financing is more important for REITs than for firms in other industries.

According to the agency theory, high dividend paying REITs should have lower external financing costs and achieve higher externally financed growth. We follow Demirgüç-Kunt and Maksimovic (1998) to measure growth achieved through

external funding, and use simultaneous equations to analyze the impact of excess dividends on externally financed growth. Our findings show that externally financed growth is positively related to excess dividends. By partitioning our sample into high and low Q subsamples, we show that the positive relation between dividends and growth is dominated by the high Q group. Since high Q REITs have more investment opportunities and greater need for external funding, the differential results for high Q and low Q REITs suggest that the positive relation between excess dividends and externally financed growth is more in conformity of agency theory than the signaling hypothesis. We also show that the positive relation is stronger among firms that issue public debt or equity than non-issuers. With a sample of REITs that undertake no mergers and acquisitions during our sample period, we find that our results are not driven by large investment decisions. Our results also persist after we consider the impact of managerial entrenchment, institutional ownership, and the measurement of asset growth. Finally, we provide direct evidence that dividend payments have a significantly negative impact on the cost of equity and debt issued by REITs, verifying that our findings are indeed related to excess dividends mitigating the cost of external capitals.

This study has bearing on several important and topical issues in the literature on agency costs and dividend policy of REITs. First, while several recent studies have documented a significantly positive relation between value of REITs and excess dividends, our study identifies the channel through which the additional value accrues. Second, our findings are relevant to the growing evidence on the important role of bank lines of credit in enabling REITs to keep debt ratio and cost of debt low by providing liquidity, financial flexibility, monitoring and certification services. Specifically, our evidence substantiates the notion that mechanisms that mitigate information asymmetry and agency conflicts reduce cost of external capital and boost investment in cash-constrained firms. Third, the positive relation between dividend distribution and growth is contrary to the evidence in the extant literature. We contend that dividends serve a unique role in REITs because the mandatory high level of distribution limits REIT managers' ability to build cash reserves. So, to support investment, REITs must raise capital from the market frequently, and at competitive rates. Dividend payment is effective in mitigating information asymmetry, and assuring suppliers of capital that management is not inclined to divert cash flow to enhance personal benefits. This reduces cost of capital and enhances growth. Finally, to our knowledge, this is the first study to provide direct evidence on the impact of dividend payments on cost of equity and debt among REITs. We find significantly negative relation between dividends and cost of both equity and debt. The latter result seems contrary to the extant evidence that mechanisms that reduce agency costs and protect shareholder rights (e.g. fewer antitakeover provisions) increase the risk of bondholders. We reconcile the contrasting findings as follows–in unregulated firms, takeover barriers (inducing high agency cost) reduce the risk to bondholders, whereas in REITs, high dividends (inducing low agency cost) reduce the risk of bondholders by restricting managers' access to free cash flow.

We close with some potential directions for future research. Previous literature has established a significant relation between dividends and value (proxied by Tobin's Q) of REITs. As such, Tobin's Q, dividends, and growth are endogenously determined. While we are satisfied about the robustness of our findings, future research may focus on developing more sophisticated tests. Finally, although several studies have focused

on the impact of agency conflicts on valuation of REITs, literature on the relation between agency costs and cost of equity and debt capital of REITs is sparse. We consider our results on this issue to be preliminary and worthy of detailed investigation with more data and improved measurement techniques.

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Appendix

Following Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006), we derive externally financed growth by the "percentage of sales" approach to financial planning.[30] Then the external financing a firm needs at time t can be expressed as:

$$\mathrm{EFN_t} = \mathrm{g_t} * \mathrm{ASSETSt} - (1 + \mathrm{g_t}) * \mathrm{FFO_t} * \mathrm{b_t}, \tag{A.1}$$

EFN is the external financing needed, g is sustainable growth rate, ASSETS is the size of assets in the current period, FFO is the funds from operations, and b is the proportion of FFO retained for future growth $(\mathrm{RE_t} = (\mathrm{FFO_t} - \mathrm{DIV_t}) = \mathrm{FFO_t} * \mathrm{b_t})$. The first term on the right hand side is total funds required, and the second term is the amount of funds generated from retained earnings.

Following Demirgüç-Kunt and Maksimovic (1998), we estimate three benchmark growth rates that are achievable by a firm with constrained access to external financing: the rate of growth sustainable with internally generated funds (IG), the rate of growth that can be attained with internally generated funds augmented with short-term funds (SFG), and the sustainable growth rate (SG). IG is the maximum growth rate that can be supported if the REIT relies only on internal sources. It is obtained by setting the firm's external financing to zero, i.e., EFN = 0, and setting b to (FFO – DIV)/FFO, where DIV is the amount of dividends paid. Denoting RE as retained earnings after dividends, it follows that,

$$\mathrm{IG_t} = \mathrm{RE_t}/(\mathrm{ASSETS_t} - \mathrm{RE_t}). \tag{A.2}$$

The second benchmark growth rate (SFG) is an estimate of the maximum growth rate of a firm that reinvests all its earnings after dividends, and utilizes short-term debt at the current ratio of short-term borrowing to assets.[31] This estimate assumes that the firm's short-term debt capacity does not change significantly. While this assumption ensures that the estimated growth is achievable by the firm, it suffers from the limitation of not capturing changes in the firm's short-term borrowing capacity. To

[30] This approach makes three assumptions. First, the ratio of productive assets to sales is constant. Second, the profit margin of each unit of sales is constant. Finally, the depreciation amount reported in the firm's financial statements is equal to the economic depreciation.

[31] This definition differs from that used in Demirgüç-Kunt and Maksimovic (1998) and Khurana et al. (2006), where they assume payout ratio is zero.

derive SFG, we set b as in IG, and follow Demirgüç-Kunt and Maksimovic (1998) to use the value of assets that is not financed by new short-term debt instead of total assets as in Eq. (4). Hence,

$$\mathrm{SFG_t} = \mathrm{RE_t}/(\mathrm{ASSETS_t} - \mathrm{STDEBT_t} - \mathrm{RE_t}), \tag{A.3}$$

where STDEBT is the amount of short-term debt.

The last growth benchmark (SG) is the maximum sustainable growth rate that can be achieved by a firm without issuing new equity or increasing leverage ratio beyond the current level. The firm obtains just enough short-term and long-term debt without changing its total debt to assets ratio. SG is obtained by setting b as above and using the book value of equity portion of total assets in Eq. (4). Therefore,

$$\mathrm{SG_t} = \mathrm{RE_t}/(\mathrm{EQUITY_t} - \mathrm{RE_t}). \tag{A.4}$$

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