THE VALUE OF RELATIONSHIPS IN REAL ESTATE INVESTMENT TRUSTS

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SUMMARY

The value of relationships has been the subject of intense discussion in recent years. Although numerous studies have examined the costs and benefits of relationships, the specific sources of the value of relationships are ambiguous. In this study, we investigate the value of relationships in Real Estate Investment Trusts (REITs). We conduct three separate empirical studies that cover the following aspects of relationships: (a) the insurance value of relationship banking; (b) the value of sponsor backing at the time of an IPO; and (c) the value of firm-sponsor business relationships (related party transactions) after an IPO.

The major findings of this dissertation are as follows. The first essay examines a precise source of added value in relationship banking, namely, the insurance value of relationship banking in protecting firms against credit crises. Consistent with previous literature, we use the existence of bank lines of credit as the evidence of the formalization of a banking relationship. We empirically test the ability of individual REITs to drawdown on established lines of credit during a credit crisis. We find that bank lines of credit indeed insulate REITs from market-wide rationing and firm-level credit risk deterioration. The insurance value is, however, qualified for smaller and more risky firms, implying that the insurance value of bank lines of credit is not equal for all firms. Smaller and more risky firms are more likely to be rationed in a credit crisis. We also establish the importance of bank lines of credit in liquidity management and the investment funding of REITs.

The second essay tests the value of sponsors backing in REIT IPOs in relation to the numbers of shares that sponsors retain at the time of an IPO and the reputation of the sponsor. Consistent with the signaling hypothesis, we find a positive relationship between sponsor ownership and underpricing, indicating that quality REITs use both the number of shares retained by the sponsor and the level of underpricing to signal their quality type. Importantly, we establish

that these quality signals are determined jointly, which represents a new finding in the literature. Further tests reveal that IPOs that are backed by quality sponsors tend to exhibit superior long-term performance. Our results also support the commitment hypothesis that developers that spin-off REITs tend to hold more shares at the time of IPO, possibly to compensate investors for the potential moral hazard problems post-IPO.

The third essay focuses on the firm-sponsor relationship post-IPO in terms of related party transactions (RPTs). We examine the dollar value of RPTs and their impact on firm valuation. REITs with high RPT activity are assumed to have closer relationships with their sponsors. Our analysis shows that RPTs have a positive impact on firm value, with the benefits flowing primarily from related party acquisitions. The positive effect of related party acquisitions is however qualified during a financial crisis. Moreover, our results suggest that the investors are fully aware of the risk associated with these RPTs. Specifically, IPOs with higher dollar value of RPTs in the first year after IPO tend to be priced at a discount at the IPO (underpricing).

Overall, this thesis demonstrates the value of firm-bank and firm-sponsor relationships in the context of REITs. The first essay reveals the insurance value of banking relationships in protecting REITs against credit crises, although this protection may not valid for small or risky firms. The second and third essays shed light on the value of a close relationship with an IPO sponsor in signaling the value of a firm at the time of the IPO, and in channeling value-enhancing business transactions to the REIT after the IPO.

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CHAPTER ONE

INTRODUCTION

"Business is not just doing deals; business is having great products, doing great engineering, and providing tremendous service to customers. Finally, business is a cobweb of human relationships."

Henry Ross Perot
American businessman

1.1   The Economics of Relationships

The increasing turbulence in the marketplace has led to the emergence of a new paradigm in the business world that focuses on relationships rather than transaction orientated business strategies. Firms consistently strive to build close relationships with their stakeholders to create a competitive edge over their competitors. Every day events support the view that relationships can alter economic behavior. For example, realtors recognize that the sale price of a particular land depends on the relationship between the seller and the buyers. Family and friends trade at different levels and terms than do strangers. At the firm level, preferential offers in business arrangement are made when a relationship exists.

Evidence that relationship matter made economists to rethink whether self-interest is economic agents' sole motive. The main framework adopted by the economists to explain why self-interested agents manage to cooperate in a long term relationship is the theories of repeated games. Formally, repeated games refer to a class of models where the same set of agents repeatedly play the same game, called the 'stage game', over a long (typically, infinite) time horizon. In contrast to the situation where agents only interact once, any mutually beneficial outcome can be sustained as equilibrium when agents interact repeatedly and frequently. This is because the value of future interaction serves as the rewards and penalties to discipline the agents'

current behavior.[1] Long-term relationships are therefore recognized as one of the ways to achieve market efficiency besides market competition and writing of a formal contract to bind the economic agents (Michihiro, 2006).

The formation of long-term relationship had led to the writing of informal or relational contracts featuring informal agreements and unwritten codes of conduct that powerfully affects the behavior of economy agents. Baker, Gibbons and Murphy (2002) who developed a repeated-game models to model the relational contracts argue that relational contracts help circumvent difficulties in formal contracting. Unlike a formal contract that must be verified ex-post by the third party, a relational contract allows the parties the parties to utilize their detailed knowledge of their specific situation and to adapt to new information as it becomes available.

My goal in this thesis is to explore two types of relational contracts formed between firm and its stakeholders, namely, the bank and the IPO sponsors. The main reason to focus on these relational contracts is the existence of soft-information, i.e. information that is not available to the public and cannot be directly verified by anyone other than agent who produces it (Stein, 2002), generated through repeated interaction and personal contact between the firm and its bank and IPO sponsors.

According to Berger and Udell (1995), bank lines of credit are an attractive vehicle for studying the firm-bank relationship because they represent a formalization of banking relationships. Besides financing firms' investment needs, bank lines of credit represent a commitment to providing working capital financing and provide insurance against unfavorable changes in the cost and/or availability of credit from the capital market (James and Smith, 2000). The firm-sponsor relationship, on the other hand, originates from a sponsor selling assets in a private company for public listing. Public firms typically capitalize on the strength and reputation

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[1] See Samuelson (2005) for an account of how diamond handlers, who, despite having constant opportunities to steal or tamper with diamonds, refrain from doing so. This is because the handlers are involved in a relationship where opportunistic behavior could have adverse future consequences, even if it is currently unexposed.

of the sponsor by carrying the sponsor's brand name. Sponsors continue to be involved in the business decisions of public firms after the funding of IPOs through having a seat on the board of directors, retaining equity ownership in the public firm, and/or providing advisory services to the public firm for a fee. To show their commitment, a sponsor may enter into a pipeline support agreement that gives a REIT first-preference rights to the disposed properties owned by the sponsor.

1.2   The Costs and Benefits of Relationships

This section provides a brief survey of the costs and benefits of firm-bank and firm-sponsor relationships.[2] From an economic point of view, the value of a relationship is determined by its costs and benefits. If the costs exceed the benefits for either party, there is no economic reason to maintain the relationship.

1.2.1   Firm-Bank Relationship

Research has shown that a strong firm-bank relationship can alleviate the problems of adverse selection and moral hazard that arise from asymmetric information. The main reason banks are able to resolve the information asymmetry problem is due to their ability to access firms' private information. This helps banks to set loan contracts that allow for better control of potential conflicts of interest. The market tends to react positively to the announcement of a new or renewed bank loan, which supports the value-enhancing view of banking relationships (James, 1987; Lummer and McConnell, 1989). Studies have also documented the benefits of close bank-firm relationships in providing firms with better credit availability (Petersen and Rajan, 1994),

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[2] The value of close relationships has been studied from a variety of perspectives. For example, psychologists posit that close relationships are a great source of happiness that help people live bigger and richer lives than they otherwise would alone (Selterman, 2010). In marketing, Richards and Jones (2008) outline the core benefits of customer relationship management in revenue generation and cost savings. Research in supply chain management shows that by having good relationships with their suppliers, firms are able to receive better services, which increases their competitiveness (Sheth and Sharma, 1997).

better terms of credit (Berger and Udell, 1995), easy renegotiation of credit terms (Berlin and Mester, 1992) reduced costs of financial distress (Hoshi, Kashyap and Scharfstein, 1990), and the ability to smooth out loan pricing over multiple loans (Berlin and Mester, 1998).

The literature has also documented the dark side of banking relationships, where either the bank or the firm may engage in opportunistic behavior at the expense of the other party. Boot (2000) outlines two main sources of abuse in bank relationships: soft budget constraint and hold-up problems. Soft-budget constraint is the borrower's moral hazard problem, where the borrower may exert insufficient effort in preventing a bad outcome from happening, knowing that the loan agreement can be easily renegotiated with the lenders. Hold-up problems refer to situations where firms are informationally captured by banks due to the trading of private information in the banking relationship. Potential valuable investment opportunities may be lost if firms avoid bank loans for fear of being "locked" in a relationship.

1.2.2   *Firm-Sponsor Relationship*

Another strand of research focuses on the value of the firm-sponsor relationship. Studies have examined the influence or role of venture capital sponsors (Barry et al., 1990; Megginson and Weiss, 1991; Lin and Smith, 1998) private equity sponsors (Katz, 2008), angel investors (Johnson and Sohl, 2007) and managers (Chemmanur and Paeglis, 2005) in IPOs. The venture capital literature suggests that an important way for firms to mitigate the problems of information asymmetries in IPOs is to develop relationships with reputable venture capitalists. Existing empirical research also shows that venture capitalists can certify the true value of a firm, thereby reducing the level of IPO underpricing or the cost of going public (Barry et al., 1990; Megginson and Weiss, 1991; Lin and Smith, 1998). In a similar vein, Chemmanur and Paeglis (2005) show that the IPOs of firms with higher management quality are characterized by lower underpricing, this is consistent with the certification hypothesis.

In addition to quality certification, the reputation of a sponsor also serves as a key element in attracting funding in the presence of weak investor protection (Gomes, 2000; Gopalan, Nanada and Seru, 2007). In other words, the assurance provided by the sponsor substitutes for the underdeveloped legal and regulatory mechanisms. Firms that are backed by or connected to sponsors from business or family groups also have the ability to utilize the internal capital markets within the business groups when access to capital markets is limited (Almeida and Wolfenzen, 2006). Stein's (1997) theoretical model posits that large business groups exist because they play a vital role in allocating scarce internal capital in the presence of information asymmetry.

Despite the value adding nature of firm-sponsor relationships, there are costs attached to close relationships that are rooted in the sponsors' possession of propriety information. Sponsors who are also controlling shareholders may behave opportunistically in expropriating the wealth of minority shareholders by transferring resources out of the firm through self-related transactions, outright fraud or theft, loan guarantees, and so on (Johnson et al., 2000b). The market may require assurance from the sponsor that he has not exaggerated the quality of the assets he seeks to sell. Models of IPO signaling (Welch, 1989; Grinblatt and Hwang, 1989; Allen and Faulhaber, 1989) view underpricing as a costly signal of a firm's quality. Sponsors may be willing to bear the cost of signaling when the market is suspicious of their certification roles and the potential moral hazard issues post-IPO. Similarly, to align their interests with those of firm minority shareholders, sponsors may signal their quality type by retaining IPO shares to convince the market of their credibility.

1.3   Problem Statement

Asymmetric information and imperfect contracting give rise to two serious problems: adverse selection and moral hazard. Adverse selection is the problem of 'pre-contractual opportunism', where the presence of private information provides bad quality agents the opportunity to hide

their true quality prior to the signing of a contract. Moral hazard, on the other hand, is the problem of 'post-contractual opportunism,' where the presence of some unobservable (unverifiable) action provides an agent the opportunity to act contrary to the principles laid out by the agreement. Capital structure theory states that asymmetric information increases the costs of external financing, which forces firms to pass up profitable investment opportunities (Myers and Majluf, 1984; Myers, 1984). Arguably, financially constrained firms are more likely to suffer from asymmetric information due to their heavy reliance on external financing. The models of Holmstrom and Tirole (1997) and Kashyap, Stein, and Wilcox (1993), for example, predict that small, informationally opaque firms are disproportionately affected by the shocks to the balance sheets of commercial banks.

The literature survey in the previous section showed that the close relationships developed with lenders or sponsors can overcome, or at least mitigate, problems arising from asymmetric information by lowering external financing costs and the cost of going public, and enabling easy renegotiation of credit contracts, and better credit terms. Despite the growing body of literature on the value of relationships, empirical studies are continuing to explore the precise source of the value generated from close relationships. The literature on banking relationships still does not have a clear understanding of the insurance value of the bank lines of credit that are believed to protect firms against credit crises. The recent global financial crisis of 2007-2008, which was underscored by the failure and heightening of the refinancing risks faced by financially constrained firms, provides a compelling reason for studying the insurance value of banking relationships during credit crises. Although the firm-sponsor relationship has been the subject of substantial investigation, the empirical research on the value of sponsors' backing of financially constrained firms that are captivated by the sponsor is much less developed.

1.4   The Scope of the Study

This thesis does not pretend to embrace the full spectrum of the value (or costs) firms can gain from close relationships, as this is beyond the scope of this study. Accordingly, the focus of this thesis is restricted to the (a) insurance value that firms enjoy from banking relationships through having access to bank lines of credit during credit crisis periods, (b) the value of sponsors' backing at the time of IPOs, and (c) the value of the business relationships formed between firms and their sponsors, post-IPO.

This study focuses on Real Estate Investment Trusts (REITs), which are financially constrained due to their mandatory dividend payout requirements.[3] Ott, Riddiough and Yi (2004) observe that only 7% of the investments of REITs are funded by retained earnings, compared to 70% by general firms. Building close relationships with fund providers is therefore critical for REITs because they have to frequently return to the capital market for funding.

1.5   Research Objectives

The main research question that this thesis attempts to answer is: What is the value of close relationships? The first essay focuses on the firm-bank relationship and the second and third essays examine the firm-sponsor relationship.

The first essay examines the value of firm-bank relationships. As in previous literature, we take the existence of bank lines of credit as the evidence of the formalization of a banking relationship (Berger and Udell, 1995).[4] As bank lines of credit obligate banks to lend at predetermined terms, banks only offer bank lines of credit to borrowers that they know well and believe can be trusted. Bank lines of credit, which are legally binding contracts arranged to

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[3] REITs have to pay 90% of their taxable income in the form of dividends to shareholders.

[4] We are aware that our dataset lacks information on the strength of a banking relationship, such as the duration and scope of the relationship and the distance between a firm and its bank, used in the previous literature (Berger and Udell, 1995; Cole, 1998, Berger et al., 2005).

provide debt on call to borrowers at pre-specified terms, have been theorized to provide insurance protection against credit crises. We examine whether bank lines of credit can indeed provide some insurance for REITs by allowing them to access credit during times of financial difficulty. The research question for the first essay is *"Do bank lines of credit protect REITs against credit crises?*

The second essay explores the value of the firm-sponsor relationship during the IPO stage. We focus on the sponsors of Asian REITs, who have a strong influence on the REITs during the pre and post-IPO periods due to the captive management structure adopted by REITs in Asia.[5] We examine the value of sponsor backing in relation to the effect of the sponsor keeping a portion of IPO shares and the reputation of the sponsor on IPO underpricing. The captive structure provides a unique laboratory in which to examine the opposing effects of sponsor certification and signaling on the costs of going public. While the certification role of sponsors implies a lower cost of going public, concerns over agency issues may force sponsors to use underpricing as a tool to signal their good quality. The research question for the second essay is *"Do IPO sponsors provide quality certification or signal the firm value of REITs during IPOs?"*

The third essay explores the value of the firm-sponsor relationship post-IPO by focusing on firms' related party transactions (RPTs). The sponsors continue to maintain a business relationship with the REITs by serving as advisors to REITs for a fee and providing REITs with a pipeline of properties for future acquisitions. These RPTs can be beneficial to the REITs, due to the strict rules on corporate governance that mitigate the concerns of abusive RPTs. Besides, industry observers generally view positively the aggressive growth strategies pursued by REIT managers that boost the portfolio's overall yield. One avenue for managers to do so is through related party acquisitions. The potential benefits of RPTs in the REIT sector are nevertheless clouded by the anecdotal evidence of the abusive RPTs that led to the collapse of large

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[5] Asian REITs are structured as captive REITs where an independent asset management firm wholly owned by the sponsor is set up to externally manage the REIT.

corporations, such as *Enron* and *WorldCom*, in the US. Hence, whether RPTs in the REIT sector are beneficial or abusive is still an empirical question. Therefore, the research question for the third essay is, *"Are related party transactions detrimental to shareholder value?"*

1.6   Research Contributions

The first essay of this thesis contributes to the current relationship banking literature by examining the insurance value of banking relationships through access to bank lines of credit. The study presented in this essay sheds light on the effectiveness of bank lines of credit in protecting firms from market-wide credit rationing and from the firm-level deterioration of credit worthiness. Unlike prior studies, which employ macro-level data, we control for cross-sectional differences in the credit risk of individual firms across three separate credit crunch events between 1992 and 2007. The panel nature of the data allows us to examine the independent impact of each credit crunch and the increase in firm credit risk on the usage of bank lines of credit. To the best of my knowledge, the first essay of this dissertation represents the first comprehensive empirical study of the insurance value of bank lines of credit in the context of REITs.

The second essay extends the IPO literature by exploring the value of sponsor backing in relation to Asian REIT IPOs. Despite the economic importance of IPO sponsors, none of the REIT studies control for the commitment and reputation of the sponsor when examining the pricing of IPO shares. A higher number of shares retained by the sponsor indicates their willingness to maintain a long-term relationship with the REIT after the public listing. Moreover, the sponsors who maintain IPO shares also signal their confidence in the REIT's long-term performance to the market. This essay also contributes to the literature in terms of methodology by jointly modeling the pricing decision and the quantity of shares held by the sponsor using a 2SLS simultaneous estimation, with underpricing and the proportion of shares retained by the sponsor as the two dependent variables. To the best of my knowledge, the second essay of this

thesis is the first study to examine the role of REIT sponsors in the pricing and performance of IPO shares.

The third essay contributes to the literature on related party transactions (RPTs) in two ways. First, in contrast to prior studies, which focus on the expropriation of wealth through the RPTs of controlling individuals, this essay focuses on the RPTs of the sponsors of Asian REITs who are also the majority shareholders of the REITs. The higher concentration of sponsor ownership in Asian REITs raises concerns over the expropriation of the wealth of minority shareholders by the sponsor. Second, the global financial crisis of 2008-2009 provides an opportunity to test the impact of RPTs on firm value during crisis and non-crisis periods. Arguably, firms are more prone to expropriation through RPTs during crisis periods. To the best of my knowledge, the third essay of this thesis is the first study to examine the occurrence and economic impact of RPTs within the REIT context.

1.7   Organization of the Thesis

This thesis is organized as follows. Chapter Two presents the first essay, titled *Can Bank Lines of Credit Protect REITs against a Credit Crisis?* This chapter explores a unique value of banking relationships, that is, the insurance value of bank lines of credit in protecting REITs against credit crises. The value of sponsor backing at the time of an IPO is examined in Chapter Three, in the essay entitled *Sponsor Backing in Asian REIT IPOs*. Chapter Four presents the third essay, entitled *Related Party Transactions, Wealth Expropriation and Firm Valuation: Evidence from REITs*. This chapter investigates the value (or cost) of firm-sponsor business relationships by examining the incidence of related party transactions and their economic impact on firm performance. The final chapter concludes the thesis, highlights the limitations of the study, and provides recommendations for further research.

CHAPTER TWO

CAN BANK LINES OF CREDIT PROTECT REITS

AGAINST A CREDIT CRISIS?

"With origination of traditional debt capital instruments and CMBS all but dried up, and many banks ratcheting down their commercial real estate lending exposures, significant questions remain as to how REITs and large commercial real estate companies will manage over the next 12-24 months."

— *SNL Real Estate and SNL Center for Financial Educations' Webminar (March 3, 2009) on "The REIT Credit Crisis – Managing Through Today's Commercial Real Estate Crisis".*

2.1   Introduction

The financial wellbeing of Real Estate Investment Trusts (REITs), as reflected in the above quotation, is highly dependent on the availability of credit. They are not insulated from credit crunches and in the current tight credit market, a primary concern of financially constrained REITs is their ability to access capital and maintain adequate liquidity to refinance maturing loans and fund capital expenditures. Scholars have theorized that bank lines of credit can play an important role to insure firms against credit crunches. Unlike a term loan that is arranged as and when a firm needs funding from the bank, line of credit is a legally binding contract that is arranged in advance.[1] Under a loan commitment contract, the lender agrees to extend credit at the borrower's request up to some pre-specified amount over a given time period. The pre-arranged credit line, which functions very much like cash reserves or financial slack, permits the borrower to move quickly and confidentially to take advantage of investment opportunities. Furthermore, it is argued that the loan commitment explicitly provides insurance against credit rationing since the

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[1] Note that bank lines of credit, commitment loans, or revolving credit lines are used interchangeably. Essentially, they are prearranged loans which allow the borrowers to draw certain amount of loans under a stipulated pricing with certain period. To compensate lenders, commitment loans typically carry various fees, such as upfront fees (collected at origination of the commitment), annual fees (collected at the beginning of each year), and commitment fees (collected at the end of each year and assessed on the average unused balance for the year). In contrast, spot loans only include upfront and annual fees (see Qi and Shockly, 2006).

bank is precluded from denying a funding request on the basis of a decline in the capital market conditions. Supporting the insurance hypothesis, Sofianos, Wachtel and Melnik (1990) and Morgan (1994, 1998) find that the aggregate level of loan commitments (as compared to non-commitment loans) are less susceptible to changes in the credit market conditions.

A limitation in earlier studies using macro-level data is the inability to control for the credit risk of individual firms, which may decline in varying degrees following adverse developments in the credit market. This is an important consideration since most loan commitment contracts contain "materially adverse change" (MAC) clauses which may hamper the ability of firms, particularly those who are in breach of the financial covenants, to draw down on their established credit lines. Sufi (2009) recently observes that firms in violation of a covenant in their credit lines losses access to about 15 to 30% of their credit lines capacity. In other words, lines of credit are poor liquidity substitute for certain firms. Finding that more stressed banks disbursed fewer funds to existing commercial borrowers under pre-committed formal lines of credit, Huang (2009) contends that credit lines only provide contingent and partial insurance for some borrowers during the subprime mortgage crisis.

Thus, an important question to investigate is whether firms can actually draw down on their lines of credit when they need them most, particularly in a tight credit market or when they suffered a dramatic decline in their credit quality. In this study, we examine the effectiveness of bank lines of credit in protecting firms from market-wide credit rationing and from firm-level deterioration of credit worthiness. Concentrating on the insurance roles of loan commitments, two insurance-related hypotheses are tested: The first hypothesis relates to protection against credit rationing at the macro-level due to tightness in the capital market, whilst the second hypothesis relates to protection against credit risk at the firm-level due to decline in the credit quality of individual firms. To provide a more direct test on the effectiveness of the insurance shield purportedly offered by bank lines of credit, we concentrate our investigation on the ability of firms to draw down on existing credit lines. In practice, most borrowers do not utilize the full

credit line at origination as this would defeat the purpose of using credit lines as a hedge against future financial flexibility. The empirical evidence on utilization of loan commitments at the corporate level is scant with prior studies concentrating largely on the origination of credit lines.[2]

We employ a panel data set which facilitates a dynamic analysis of the credit line utilization decisions of a cross-section of financially constrained firms over time. This complements prior studies which examined the aggregate amount of credit lines issued over time. Specifically, our data set covers 8,267 firm-quarter observations covering 273 REITs publicly traded between 1992 and 2007. The panel nature of the data is advantageous in allowing an examination on the switching role of loan commitments in differing market conditions. In a normal credit market, loan commitments may play a more significant role as a short-term source of bridging finance for new investments. However, in a tight credit market, loan commitments may function more as a hedging instrument against refinancing risks.

The current study focuses on REITs because the theory suggests that bank lines of credit play a more important role in the financial management of financially constrained firms. Most REITs have low financial reserves because they are required to disburse at least 90% of their net income as dividends. Their sensitivity to credit market illiquidity is further exacerbated by the fact that real estate investment, which is the principal activity of REITs, requires huge capital commitments. REITs are, therefore, more vulnerable to the under-investment problem highlighted by Myers (1984) and their performance are highly susceptible to the availability and cost of credit.[3] The data indeed underlined the significant role loan commitments played in the

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[2] An exception is Agarwal, Ambrose and Liu (2006) who study the utilization rate of consumer credit lines. There are, however, a number of important differences that exist between consumer credit lines and corporate credit lines. Besides involving smaller amount, consumer credit lines do not have upfront commitment fees, which are common in business credit lines. Furthermore, unlike business credit line that is unsecured, consumer credit line is collateralized by the borrower's principal residence.

[3] Ott, Riddigiouh and Yi (2005) observe that only 7% of REITs' investments are funded by retained earnings, as compared to 70% be general firms. Another sector that is highly dependent on the availability of bank credit is the homebuilding industry. In a recent study, Ambrose and Peek (2008) find that a

liquidity management of REITs: Used lines of credit represent 18.0% of the sector's total debt. At any time, 41.5% of the lines of credit are drawn down, leaving an unutilized float of 58.5%. The size of the unused portion is approximately 8.9% of the total assets of the sector. Scaling the unused credit balance by the sum of unused lines and cash, bank liquidity represents 73.8% of total liquidity available to REITs, which is much higher than the 45% registered by general firms (Sufi, 2009).[4]

The empirical tests are carried out in three stages. In the first part, we analyze the credit utilization of the REIT sector at the aggregate level using a vector autoregression (VAR) model. Second, fixed-effects panel regressions as well as discrete choice logistic regressions are employed to study the impact of credit crisis on the utilization of credit lines by individual REITs over the sample period. Next, focusing our attention on smaller and riskier REITs, we test whether they would be able to enjoy the same insurance protection afforded by bank lines of credit to larger and less risky firms. To preview our results, the empirical evidence supports the insurance hypothesis. Loan commitment is indeed an important avenue for REITs to hedge against credit rationing during a capital crunch or against a fall in credit quality. The regression results show that REITs use more loan commitments as compared to spot loans in tight capital markets. Their reliance on loan commitments also increases after a decline in their credit worthiness. The logistic regression modeling the probability of individual REITs increasing their loan commitments also yield results consistent with the insurance-related hypotheses of credit lines. We also observe that REITs seek to extend their credit limit when they expect a future decline in their credit quality. However, the effectiveness of the insurance protection is qualified in the case of small and risky firms which may not get to establish credit lines or expand existing ones in the first place. Furthermore, even if they succeed, their ability to draw down on the

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sustained decline in the large private homebuilders' market share from 1988 to 1993 corresponded with a reduction of lending activities by the local banks.

[4] Our preliminary inspection of credit lines utilization and size of credit lines do not reveal any systematic pattern across different types of REITs.

establishing the credit lines subsequently may still be restricted in a credit crisis. Other supplementary results of the empirical tests reinforce the importance of bank lines of credit in liquidity management and investment funding of REITs. REITs that have more cash holdings are less likely to utilize their loan commitments, whilst REITs undertaking new investments are likely to draw down on their credit lines.

The rest of this chapter proceeds as follows: In Section 2.2, we present a review of the literature. In Section 2.3, we outline our research design and data. In Section 2.4, we discuss the empirical results. In Section 2.5, we examine the effectiveness of the insurance protection across different firms. Section 2.6 concludes.

2.2   Literature Review

Data reported by the Federal Reserve in May 2008 shows that commitment loans constitute 75.4% of all commercial and industrial loans issued by commercial banks over the past eleven years. The remaining one-quarter of the loans are issued as spot loan contracts. Although they may cost more in the form of an up-front commitment fee as well as a non-usage fee, credit lines are generally perceived as being more flexible and convenient than spot loans. Numerous theories have been developed to explain the popularity of loan commitments, both from the viewpoints of the lenders (supply) and the borrowers (demand).

From the suppliers' perspective, one major strand in the banking literature postulates that loan commitments help to resolve adverse selection (Thakor and Udell, 1987; Shockley and Thakor, 1997) and moral hazard problems (Boot, Thakor and Udell, 1987) associated with commercial loans issued in the spot market. Capital structure theories prescribe that high interest rate associated with debt motivates borrowers to select high risk projects (asset substitution problem) or reduce their level of effort (moral hazard problem). Boot, Thakor and Udell's (1987) model shows that loan commitments can resolve this dilemma since a borrower will only draw down on his credit line if the current spot rate is higher than the interest rate pre-fixed in the loan

commitment contract. The interest concession would also mitigate any potential underinvestment problem. Other "supply-based" reasoning in favor of loan commitments include the commercial banks gaining credibility by honoring promises made under the credit lines (Boot, Thakor and Udell, 1991), managing uncertain loan demands more efficiently (Greenbaum, Kanatas and Venezia, 1991), and enjoying cost advantages over other financial institutions (Gatev and Strahan, 2006).

From the borrowers' perspective, loan commitments are essentially viewed as an insurance policy against credit tightening, which could result from either a dramatic deterioration in the borrower's own credit worthiness (Campbell, 1978; James, 1981; Thakor, Hong and Greenbaum, 1981; Hawkins, 1982; Thakor, 1982) or a credit crunch in the capital market (Blackwell and Santomero, 1982; Melnik and Plaut, 1986; Sofianos, Wachtel, and Melnik, 1990; Avery and Berger, 1991; Berger and Udell, 1992; Morgan, 1994, 1998). For example, Thakor, Hong and Greenbaum (1981) model credit lines as a put option with the face value of the credit lines as the striking price. Borrower has financial incentive to borrow from spot market when their credit quality improves (option is out-of-money) and switch to credit lines for a lower rate when their credit quality deteriorates (option is in-the-money). In practice, loan commitment contracts normally contain a "material adverse change" (MAC) clause - under which banks can revoke or change the terms of the credit lines. Although the presence of the MAC clause theoretically reduces a firm's protection against future credit deterioration, Melnik and Plaut (1986), Ergungor (2000) and Sufi (2009) noted that lenders seldom invoke the MAC clause due to high legal and reputation costs.

Empirically, the results using macro-level data are mixed. Whilst Berger and Udell (1992) failed to find any empirical support for the insurance hypothesis, Morgan (1998) observes that tight credit policy slows the growth of spot loan but has no impact on the growth of loan commitments at the aggregate level. Sofianos, Wachtel and Melnik (1990) similarly find that monetary policy has a significant impact on spot loans, but not on loan commitments. In a recent

study on bank lending during the financial crisis of 2008, Ivashina and Scharfstein (2010) document an increase in drawdowns of revolving credit facilities, and many of these drawdowns were undertaken by low credit quality firms concerned about their access to funding. They also noted that many firms which drew down their credit lines interestingly kept the proceeds in low-yielding cash, which leads to a "negative carry". The authors, nevertheless, justified that such actions may still be viewed as rational given the borrowers' concern on the future ability of the banks to honor their loan commitments. In a parallel study, Huang (2009) finds that more stressed banks disbursed fewer funds to existing commercial borrowers under precommitted formal lines of credit. Observing that the impacts were concentrated on smaller, riskier, and shorter-relationship borrowers, the author suggests that credit lines provided only contingent and partial insurance for some borrowers during the crisis. Thus, he contended that loan commitments may not be as committed as they seem and credit lines are not perfect substitute for cash holding, particularly in a credit crisis. An important question to ask is "can bank lines of credit protect financially constrained REITs against a credit crisis?"

To our knowledge, the insurance role of credit line has not been tested explicitly in the context of REITs. The closest studies to ours are recent studies by Hardin and Hill (2011) and Case, Hardin and Wu (2012) who provide descriptive evidence on REITs' credit lines utilization patterns during financial crisis 2008-2009. Although they did not focus on the insurance role of credit line, these studies show that credit lines utilization increases during the 2008 and 2009 financial crisis. In another study, Riddiough and Wu (2009) conclude that constraints on retention of cash flow distort REITs' investment decisions. Observing that REITs manage their liquidity through dividend policy and access to short-term bank finance, especially bank lines of credit, they conclude that REITs use bank lines of credit as a substitute for cash. Hardin *et al.* (2009) and Hill, Kelly and Hardin (2012) have also examined the substitutability between credit lines and cash holding. The above studies focus on the liquidity role of bank lines of credit where cash and credit lines are viewed as substitutes. Within this theoretical framework, the relative speed and

flexibility offered by credit lines enables firms to take advantage of investment opportunities that would disappear if they had to obtain approval from spot-market loans (Martin and Santomero, 1997).

In contrast, our current study examines the question of whether REITs are able draw down on their credit lines in a credit crisis, either due to a decline in their credit standing or a tightening of credit in the capital markets. The ability of individual REITs to drawdown on established credit lines during a credit crisis will determine whether they are insulated from market-wide rationing and or firm-level credit risk deterioration. For the insurance protection to be valid, their credit line utilization should be related positively to such events.

2.3   Research Design and Data

2.3.1   Research Hypotheses

The option model of credit lines (Thakor, Hong and Greenbaum, 1981) predicts that firms will use more loan commitments when their credit quality deteriorates because the put option is in-the-money. On the other hand, they will issue more spot loan when their credit quality improves because the put option is out-of-money. Ergungor (2000) theorizes that the choice of spot loans versus credit lines is conditional on credit market liquidity and predicts that borrowers will opt for credit lines over spot loans during tight credit markets.

In sum, the main implication of the insurance story is that the credit utilization rate would increase, vis-à-vis the spot loan, following a decline in the borrower's credit quality. And at the macro-level, the demand for loan commitments is expected to be inversely correlated with the level of credit liquidity in the capital market. This leads to our two hypotheses pertaining to the drawdown of credit lines:

Hypothesis 1: REITs are more likely to draw down on their credit lines during a tight credit market.

Hypothesis 2: *The credit line utilization rate is inversely related to changes in the REIT's credit quality in the preceding period.*

Hypothesis 1 predicts that REITs will draw down their bank lines of credit in a tight credit market. We follow Gatev and Strahan (2006) in using the paper-bill spread, which is defined as the difference between interest rate on 3-month commercial paper of high-grade (Aa) nonfinancial borrowers and the 3-month treasury-bill, as a proxy for market liquidity. **Figure 2.1** charts the paper-bill spread between 1992:Q1 to 2007:Q4. There are three distinct peaks in which the spread were close to or exceeded 100 basis points, namely 1998:Q3, 2001:Q3, and 2007:Q3. The first peak in 1998 coincided with the Long-term Capital Management (LTCM) hedge fund debacle; the second peak in 2001 corresponded with market uncertainties following the 911 terrorism attack and the burst of the dot.com bubble; whilst the latest peak from 2007 onwards is associated with the credit crunch following the subprime crisis. Since we are interested in the role of loan commitments during periods where rationing is occurring in the capital markets, a time-varying binary variable, *Credit Crunch*, is created.[5] Based on Hypothesis 1, we predict this variable to be positively related to credit line utilization.

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[5] The variable *"Credit crunch"* equals unity if the paper-bill spread is within the top 10% percentile of observations; zero, otherwise. The conclusions do not change materially when the 25% top percentile are used as the cut-off points. If any, the results become even stronger.

Figure 2.1: Paper-bill spread during 1992Q1-2007Q4
This chart tracks the paper-bill spread from 1992:Q1 to 2007:Q4. The paper-bill spread is defined as the yield on 3-month high grade (Aa) commercial paper minus the corresponding yield on 3-month treasury-bill.
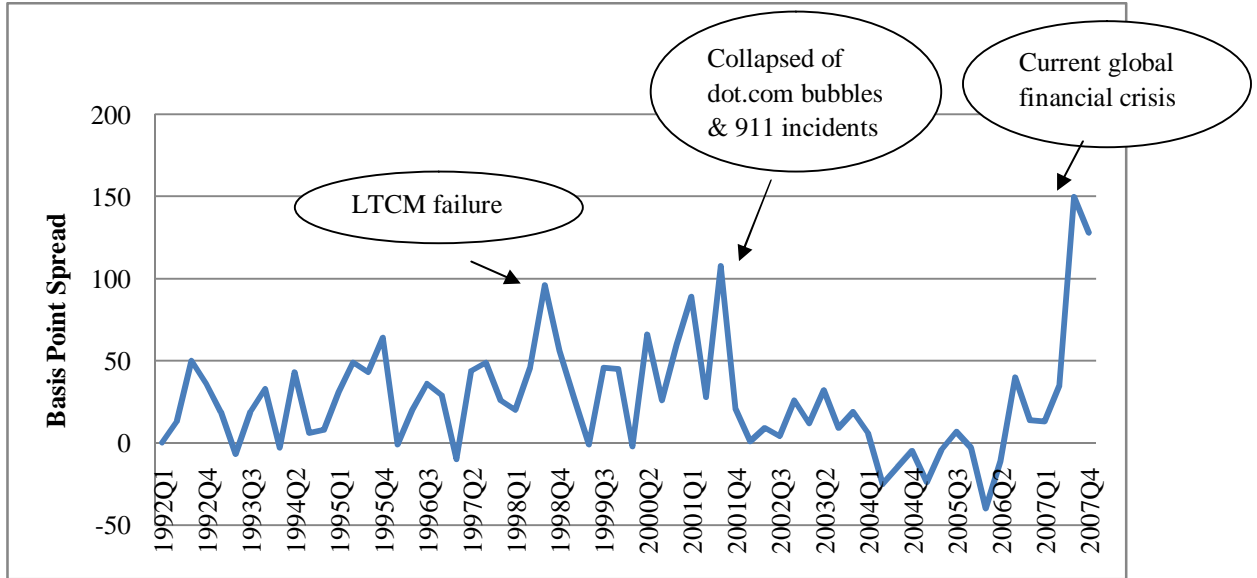
Hypothesis 2 predicts that firms will use more credit lines following a credit quality decline. Credit quality is represented by the firms' earnings before interest, taxes, depreciation and amortization (*EBITDA*) coverage ratio, which is frequently relied upon by lenders and rating agencies to evaluate a firm's credit worthiness and repayment capacity. A high EBITDA coverage means a high credit quality REIT.[6] We measure the ex-post change in credit quality as the difference in the individual REIT's credit quality (Δ*Credit Quality* $_{t-2,t-1}$), and predict that it has a positive relation with credit line utilization.

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[6] In addition to EBITDA coverage, we also employed other measures of credit quality, such as return on assets and EBITDA scaled by total assets. As the results are not materially different, we do not report them in this chapter.

2.3.2   Sample

The study period covers 64 quarters from 1992:Q1 to 2007:Q4. The length of the study period

enables us to consider the impact of macroeconomic conditions on the credit limits and utilization

of REITs as well as the shifting roles of lines of credit in different market conditions.

Quarterly data on the financial characteristics of the individual REITs, such as firm size,

growth opportunities, profitability and leverage ratio, are extracted from SNL database. From the

same database, we also collected data on whether the REIT has access to a line of credit and if so,

the used and unused portion of the line of credit. Information on the individual firm's loan

commitments and utilizations are supplemented by the individual REIT's quarterly (10-Q) and

annual (10-K) filings to the SEC. Data on the macroeconomic variables are obtained from

Datastream and *Federal Reserve database*.

After omitting observations with missing values and outliers,[7] the unbalanced panel data

consists of 8,267 firm-quarter observations covering 273 REITs publicly traded between 1992:Q1

and 2007:Q4. Out of these, 10.4% of the observations did not have any established line of credit.

The summary statistics in **Table 2.1** indicate that REITs without credit lines are typically smaller,

less profitable, have lower growth opportunity, and have limited access to the public debt market.

Conversely, REITs with established lines of credit tend to be larger, are more profitable, have

more growth opportunity, and have better access to public debt market.[8] The cash holdings of

REITs with credit lines are also lower at 2% of their total assets, as opposed to 6% of total assets

for REITs without credit lines. The F-test indicates that the differences in the means across the

two groups are statistically significant.

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[7] Consistent with Riddiough and Wu (2009), we adopt the following filters to omit observations with extreme values: Market-to-book ratio less than zero or more than 5.0; change in net real estate investments below -100% or above 300%; used lines of credit-total assets ratio less than zero or more than 2.0; lines of credit-total asset less than zero or more than 2.0; and cash holdings exceeding 50% of total assets. We also omit return on asset with value of less than -100% and more than 100%.

[8] These results are consistent with a recent study by Hardin and Wu (2010) who show that REITs with banking relationships are more likely to obtain long-term debt ratings and subsequently issue public debt.

Table 2.1: Characteristics of REITs with and without bank lines of credit
This table compares the firm characteristics of 7,409 firm-quarters with establised bank lines of credit against the corresponding financial characteristics of 858 firm-quarters without any established line of credit. The unbalanced panel data covers 273 REITs over a 15-year period (Q1:1992 - Q4:2007). Asset growth rate refers to the 5-year compound annual growth rate of the individual REITs' total assets.

	REITs with credit lines	REITs without credit lines	Mean Equality Tests
Firm size			
Market capitalization (US$ million)	1,227.8	121.1	***
Total assets (US$ million)	1,902.9	206.1	***
Listed at NYSE (0,1)	0.90	0.36	***
Growth Opportunity			
Market-to-book ratio	1.25	1.09	***
Asset growth (%)	22.39	8.59	***
Profitability			
EBIT/total assets	0.07	0.06	***
EBITDA/total assets	0.10	0.08	***
ROA (%)	3.74	3.01	***
Debt Capacity			
Debt/total assets	0.49	0.32	***
Spot/total assets	0.40	0.31	***
S&P rating (0,1)	0.33	0.02	***
Cash/total assets	0.02	0.06	***
No of Observation	7,409	858	

*** The figures reported in the first and second columns are statistically distinct at the 1 per cent level using the mean comparison test with equal variances.

The summary statistics of total loan commitments as well as the used and unused portion of the line of credit for the sample of 8,267 firm-quarter observations are reported in **Table 2.2**. It highlights the importance of credit lines in the debt policy and liquidity management of REITs. Bank credit lines, on the whole, represent large amounts of used and unused debt capacity of REITs. On average, the data shows that total line of credit represents 16.3% of total assets; the unused portion represents 8.9 % of total assets and the used portion represents 7.4%. As a proportion of the outstanding debt balances, used lines of credit represent 18.0%. Thus, any study on the capital structure on REITs should also consider the role of loan commitments.

Table 2.2: The importance of bank lines of credit to REITs
This table reports several measures to assess the importance of bank lines of credit in the debt policy and financial management of an unbalanced panel of 273 REITs from Q1:1992 to Q4:2007. The reported figures represent the mean and median values for the full sample, as well as sub-samples by having a corporate credit rating, and by having debt outstanding.

Panel A	Full sample		Firms without credit rating		Firms with credit rating	
	Mean	Median	Mean	Median	Mean	Median
Established line of credit (0,1)	0.896	1.000	0.855	1.000	0.995	1.000
Line of credit/total assets	0.163	0.146	0.172	0.154	0.141	0.136
Unused line of credit/total assets	0.089	0.072	0.090	0.069	0.085	0.075
Used line of credit/total assets	0.074	0.051	0.081	0.054	0.056	0.048
Used line of credit/total debts*	0.180	0.110	0.208	0.121	0.115	0.096
Non-commitment bank loans/total assets	0.396	0.414	0.435	0.458	0.376	0.372
Line of credit/total liquidity	0.797	0.944	0.753	0.939	0.901	0.955
Unused line of credit/unused liquidity	0.738	0.887	0.692	0.868	0.850	0.918
Utilization rate of lines of credit#	0.415	0.426	0.434	0.458	0.376	0.372
Number of Observations	8,267		5,835		2,432	

Note: * Conditional on firms having debt (7930 observations); # Conditional on firms having lines of credit (7393 observations)

Panel B	Firms without any outstanding debt	
	Mean	Median
Established line of credit (0,1)	0.208	0.000
Line of credit/total assets	0.034	0.000
Line of credit/total liquidity	0.140	0.000
Number of Observations	337	

The statistics reported in the last two columns of Table 2.2 indicate that bank lines of credit remain an important part of debt policy for firms that have access to public debt. Specifically, bank loan commitments represent 14.1% of total assets and 11.5% of total debt employed by REITs that have access to public debt. Furthermore, Panel B of Table 2.2 shows that 20.8% of the firm-quarters that have no debt outstanding still have access to lines of credit and the average size of their lines of credit represents 3.4% of total assets.

To highlight the importance of lines of credit in corporate liquidity management of REITs, two additional measures of liquidity are reported. The first measure is the total line of credit limit scaled by the sum of total lines of credit and cash. The second measure is the unused

line of credit balance scaled by the sum of unused lines and cash. [9] By either measure, bank

liquidity represents, respectively, 79.7% and 73.8% of total liquidity available to REITs, which is

significantly higher than 51% and 45% for general firms (Sufi, 2009). This confirms that bank

credit line is an important instrument in the corporate liquidity management of REITs. **Figure 2.2**,

nevertheless, shows that since 1998Q3, the proportion of bank lines of credit over total debts has

declined, corresponding to an increased popularity of public debts with REITs. Wu, for example,

(2005) reported that public debts overtook equity financing as a source of financing for REITs

during the period 1999-2003. Following the recent dissipation of capital from the public debt

market, it is anticipated that credit lines of credit will regain their prominence.

Figure 2.2: Commitment loans and non-commitment loans by REITs (1992:Q1-2007:Q4)
This chart tracks the commitment loans and non-commitment loans employed by the REIT sector from
1992:Q1 to 2007:Q4. Commitment loans refer to the utilized portion of credit lines scaled by total assets.
Non-commitment loans refer to outstanding debts that are issued in the spot market, which is also scaled by
total assets. The reported figures are median values.
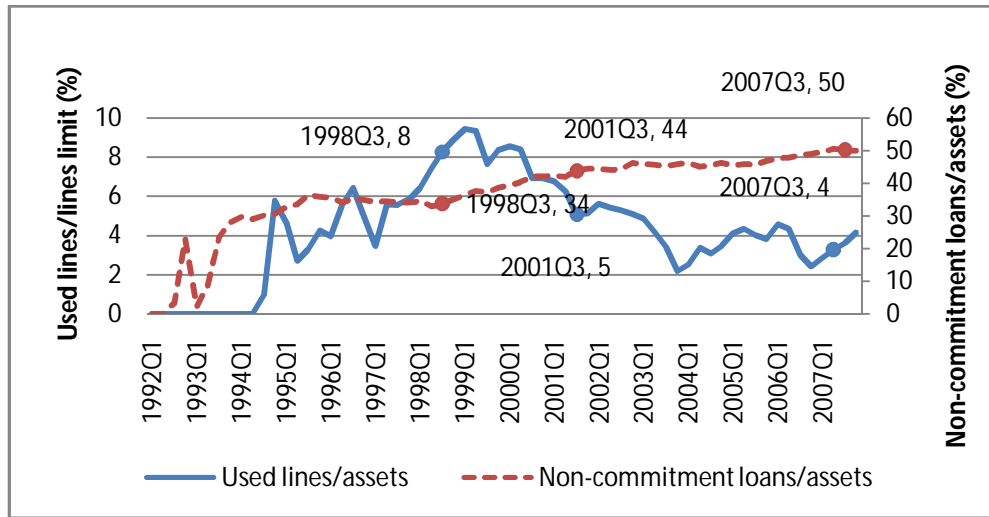
Note that the last row of Table 2.2 (Panel A) reports the utilization rate of lines of credit

established by REITs. This refers to the percentage of a firm's committed credit line that was

actually drawn down in a given quarter. On average, 41.5% of the established bank credit lines

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[9] The first measure takes into account mechanical endogeneity concerns that certain types of firms
consistently draw down heavily on existing lines of credit, whilst the second measure captures the fraction
of liquidity available to the firm in the form of lines of credit (Sufi, 2009).

are drawn down at any point in time. This leaves an unutilized float of 58.5%. In comparison, Martin and Santomero (1997) reported that non-REIT firms utilize 65% of their credit lines, indicating that they maintain a smaller unutilized float as compared to REITs. This observation further strengthened our argument that lines of credit play a more important role in the case of financially constrained REITs.

2.4   Results

2.4.1   Time Trend Analysis

In **Figure 2.3**, we chart the utilization rate of credit lines against the corresponding movements in the paper-bill spread. The insurance role of bank lines of credit prescribes that unutilized commitment protects the firms from credit rationing in a market-wide liquidity crunch. Thus, a positive relationship between utilization rate and the paper-bill spread is expected. The general pattern in Figure 2.3 indeed suggests that the aggregate demand for loan commitments of the REIT sector is correlated with liquidity in the credit market. At the end of the study period, the aggregate credit line utilization of the REIT sector increased from 23% (2006:Q4) to 33% (2007:Q4). This coincided with a tight credit market following the sub-prime mortgage market crisis, which caused the paper-bill spread to rise from 35bs (2007:Q2) to 128bs in 2007:Q4. Similarly in 1998, the credit lines usage went up from 40% (1998:Q1) to 57% (1998:Q3) when the market experienced another credit crunch. However, the anticipated upward pattern in the utilization rate during the 2001:Q3 credit crunch was not evident probably because the adverse economic impact was rather short-lived. [10]

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[10] Greenspan (2008), for instance, reported that the US economy rebounded fairly quickly and the jobless rate stabilized at their pre-911 level by end 2001.

Figure 2.3: Utilization rate of credit lines by REITs (1992:Q1-2007:Q4)
This chart tracks the credit utilization rate of REITs from 1992:Q1 to 2007:Q4. Credit utilization rate refers to the median percentage of the REIT sector's committed line of credit that was actually drawn down. The second line in the chart represents the paper-bill spread, which refers to the difference in yield between a 3-month Aa commercial paper and the corresponding yield on a 3-month treasury-bill. The left vertical axis is the reference point to paper-bill spread movement while the right vertical axis serve as reference point for credit lines used.
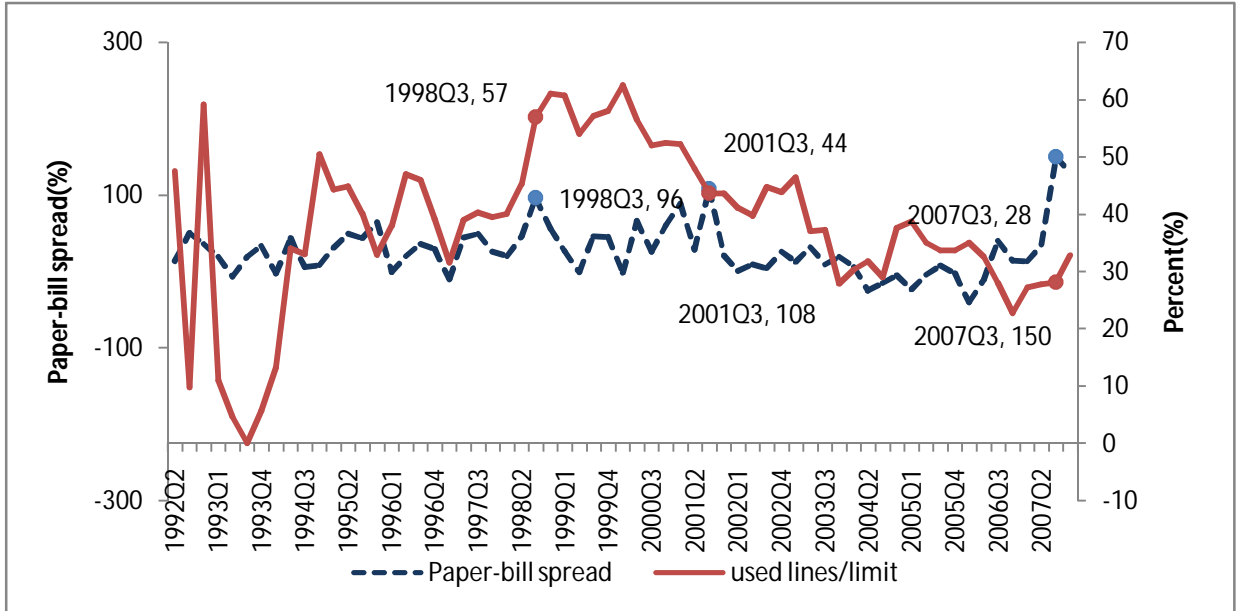
The dynamics of the relationship between credit line utilization rate (*Utilization*) and paper-bill spread (*Paper*) is further examined using a vector autoregression (VAR) model:[11]

$$Utilization_t = \alpha^{'} + \sum_{i=1}^{1} \theta_i Paper_{t-i} + \sum_{i=1}^{1} \chi_i Utilization_{t-i} + dTime_t + u_{1t}$$

where *dTime* is the time trend while *u* is the error term. The insurance hypothesis implies a positive causality between paper-bill spread and credit utilization rate. The results presented in **Table 2.3** indeed show the expected positive coefficient for paper-bill spread, but it is not statistically significant. This suggests that, at the aggregate level, credit lines may not be

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[11] Vector autoregression (VAR) is a technique for examining dynamic interactions among a set of variables without imposing any prior restrictions on the specification. All the variables in a system suggested by economic theory are regressed on lagged values of both themselves and the other variables in the system. See Sofianos, Wachtel and Melnik (1990) who estimated a VAR model to examine the impact of loan commitment agreements on the way in which monetary policy affects the economy.

completely effective in shielding REITs from the effects of capital rationing during a tight credit market.[12] In the next section, we will examine the credit line utilization rate of REITs at the firm level to get a better understanding on when and who can really exercise the option to draw down their lines of credit after origination.

Table 2.3: OLS estimation of single equation in the unrestricted VAR model
The VAR model on credit line utilization was estimated using quarterly data for period 2Q1992 to 2007Q4. T-statistics values are reported in parentheses, whist *** refer to statistical significance at 1%.

Independent Variables	
Constant	12.340***
	(2.698)
Paper-bill spread $_{t-1}$	4.850
	(1.130)
Utilization $_{t-1}$	0.632***
	(6.328)
Time trend	0.016
	(0.217)
Overall R^2	0.44
Number of Observations	63

2.4.2   Determinants of Credit Line (versus Spot Loans) Utilization

The dependent variable in our regression models is the individual REIT's outstanding loan commitments scaled by total debt in the particular period. Conditional on debt funding being employed in the REIT's capital structure, this is synonymous with the firm's choice between spot loans versus commitment loans. The explanatory variables included in our estimation models are motivated by the two research hypotheses and prior studies as outlined earlier. In particular, the two main research hypotheses are formulated to examine the effectiveness of bank lines of credit

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[12] Prior to running the VAR model, we carried out the augmented Dickey-Fuller (ADF) test to check the unit root for the two time-series. Furthermore, the lag length of one was chosen based on the Akaike (AIC) and Schwarz (SBC) criterion. Nevertheless, we also reestimated the VAR model using alternative lag length and scaling the credit line drawdown by total assets. In all the estimates, the coefficient for paper-bill spread is statistically insignificant. The test results are not reported here for brevity reason but can be obtained from the author upon request.

in shielding REITs from firstly, a market-wide credit rationing, and secondly, a credit squeeze at the firm-level due to deterioration in credit quality.

On the premise that credit lines and cash are substitutes, a negative relation between the REITs' cash holding and the likelihood of drawing down on existing credit lines is predicted. Cash holding is represented by the sum of cash and cash equivalent scaled by total assets of the individual REITs. Additional variables are incorporated into the regression models to control for firm size, age, leverage, credit quality and growth opportunities. Firm size is represented by the natural logarithm of the firm's total assets, whilst age is represented by the natural logarithm of the years since the IPO date of the individual firms. Leverage is measured by the debt-equity ratio of the firm. Credit quality is represented by the firm's interest coverage ratio. Growth opportunities are represented by the market-to-book value (M/B) ratio of the individual REITs.[13] The regression models also control for likely positively influence of the stock market performance, which is represented by the S&P 500 index's returns over the preceding two quarters. We also control for interest rate volatility, which is represented by the standard deviation of 7-year government bond yield over the past twelve months. Based on option pricing theory, the option value associated with a credit line should be more valuable in a more volatile interest rate environment (see Thakor, Hong and Greenbaum, 1981).

To recap, the definition and summary statistics of the dependent and explanatory variables are summarized in **Table 2.4**. The pair-wise correlation matrix of the explanatory variables is reported in **Table 2.5**. The magnitude of the variance-inflating factors (VIF) of 1.09 - 1.30 suggests that the independent variables are not highly collinear.

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[13] In addition to M/B ratio, we also used the compound annual growth rate of the individual REIT over the preceding 5 years as well as net increase in the individual REIT's real estate investment holding in the next period (scaled by total assets). Again, the estimation results are robust to the different measures used to represent growth opportunities.

Table 2.4: Descriptive statistics of variables
The descriptive statistics are based on a final sample of 7,188 firm-quarters.

Variables	Definition	Mean	Std.Dev.	Minimum	Maximum
Dependent Variables					
Loan commitment ratio $_t$	Outstanding loan commitments scaled by total debt.	0.176	0.215	0.000	1.000
Firm Characteristics					
ΔCredit quality $_{t-1, t}$	Change in EBITDA coverage	-0.070	2.018	-31.630	31.380
Credit quality $_{t-1}$	Measured as EBITDA without capitalized interest scaled by interest expenses	3.840	3.989	-36.000	49.260
Size $_{t-1}$	The natural logarithm of total assets	5.883	0.595	3.719	7.419
Leverage $_{t-1}$	Total debt scaled by total equity	2.008	4.551	0.000	96.640
Growth opportunity $_{t-1}$	(Total assets-total equity+ market capitalization)/Total assets	1.215	0.306	0.323	3.676
Cash holding $_{t-1}$	Cash and cash equivalent scaled by total assets	0.020	0.036	0.000	0.470
Age $_{t-1}$	The natural logarithm 1+ year since IPO	0.897	0.394	0.000	1.681
Macroeconomic Factors					
Paper-bill spread $_t$	Non-financial 3-month Aaa CP rate minus 3-month T-bill rate	0.263	0.331	-0.400	1.500
Interest volatility $_t$	Standard deviation of 7-year government bond yield over the preceding 12 mths.	0.387	0.147	0.173	0.802
Stock market return $_t$	Price appreciation of the S&P 500 index over the last two quarters	0.050	0.093	-0.176	0.221

Table 2.5: Pearson Correlation matrix of the explanatory variables
This table presents a matrix of the pair-wise correlations of the explanatory variables in the regression models. Definitions of the variables are given in Table 3. The last column reports the variance inflation factor (VIF), $1/(1-R_k^2)$, for each variables as a diagnostic statistic.

	Δ Credit quality $_{t-1,t}$	Credit quality $_t$	Size $_t$	Leverage $_t$	Growth opportunity $_t$	Cash holding $_t$	Age $_t$	Paper-bill spread $_t$	Interest volatility $_t$	VIF
ΔCredit quality $_{t-1,t}$	1.000									1.136
Credit quality $_t$	0.285	1.000								1.300
Size $_t$	-0.005	-0.115	1.000							1.190
Leverage $_t$	0.002	-0.130	0.088	1.000						1.087
Growth opportunity $_t$	0.012	0.139	0.096	0.134	1.000					1.205
Cash holding $_t$	0.032	0.112	-0.271	-0.002	0.042	1.000				1.064
Age $_t$	0.015	-0.039	0.169	0.009	0.127	-0.081	1.000			1.087
Paper-bill spread $_t$	-0.002	-0.009	0.008	0.002	-0.092	-0.040	-0.009	1.000		1.100
Interest volatility $_t$	-0.012	0.052	-0.276	-0.031	-0.153	0.008	-0.220	0.100	1.000	1.235
Stock market return $_t$	-0.006	0.035	-0.097	-0.024	0.075	-0.007	-0.107	-0.191	-0.208	1.136

The direction and strength of relationships between the explanatory variables and the dependent variable are determined using fixed-effects regression models.[14] **Table 2.6** reports the estimation results. Model 1, the base model, shows strong evidence that is consistent with the insurance role of lines of credit. In particular, we observe a positive and statistically significant coefficient for *Credit Crunch*, suggesting that REITs use more loan commitments in a tight capital markets. The results also show a negative and statistically significant coefficient for Δ*Credit Quality*$_{t-2,t-1}$, implying that REITs utilize more loan commitments after experiencing a decline in their credit worthiness. We find that the likelihood of using commitment loans is increasing with the quality of the borrower, as reflected the coefficients for firm size, credit quality and leverage. Firm age, however, have negative coefficients, which could be explained by the limited access of younger firms to public debt in the spot market.

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[14] Table 2.1 shows distinct differences between REITs with and without credit lines. Thus, credit line utilization is conditional on the individuals having access to bank credit in the first place. To control for the possibility of sample selection bias, we follow Agarwal, Ambrose and Liu (2006) in estimating the models using a two-stage Heckman selection procedure. The first stage involves the estimation of a probit model on the firm's accessibility to credit line with the following explanatory variables: firm credit quality, size, leverage, growth opportunity, cash holding, age, and property-type dummies. The second stage introduces an additional selection variable, the inverse Mills ratio, as an explanatory variable to the main estimation equation. The results, not reported but available on request, are robust and do not alter the conclusions on the insurance role of credit lines in the context of REITs.

Table 2.6: Determinants of REIT's credit lines utilization
The table presents the estimation results of two-way (firm and quarter fixed effects) panel regression models to identify the determinants of credit lines utilization (vis-à-vis spot loans) by REITs between 1992 and 2007. The dependent variable is defined as the individual REIT's outstanding loan commitments scaled by total debt in the particular time period. The total number of observations is 7,297 firm-quarters. T-statistics are reported in parentheses, whilst ***, **, and * refer to statistical significance at 1%, 5%, and 10%, respectively.

Explanatory Variables	Model 1	Model 2
Constant	0.161***	0.162***
	(2.65)	(2.66)
ΔCredit quality $_{t-2, t-1}$	-0.009***	-0.009***
	(-6.24)	(-6.24)
Credit quality $_{t-1}$	0.012***	0.012***
	(8.36)	(8.35)
Size $_{t-1}$	0.023**	0.023**
	(2.10)	(2.10)
Leverage $_{t-1}$	-0.001*	-0.001*
	(-1.88)	(-1.88)
Growth opportunity $_{t-1}$	-0.024**	-0.024**
	(-2.08)	(-2.07)
Cash holding $_{t-1}$	-0.653***	-0.654***
	(-9.13)	(-9.13)
Age $_{t-1}$	-0.158***	-0.158***
	(-9.48)	(-9.47)
Interest volatility $_{t}$	0.036**	0.036**
	(2.21)	(2.20)
Stock market return $_{t}$	0.068***	0.067***
	(3.36)	(3.27)
Credit crunch $_{t}$	0.017***	0.017***
	(3.26)	(3.27)
ΔInterest rate $_{t-1}$		0.006
		(0.45)
R^2	0.10	0.10
Number of Obs	7,297	7,297

In Model 2, we test the effectiveness of bank lines of credit to insure REITs against interest rate risk by incorporating interest rate change (Δ*Interest Rate$_{t-1,t}$*). The sign and statistical significance for the other explanatory variables are robust to the introduction of the new variable. The coefficient for the new variable is, however, not significant. This is consistent with Thakor (1982) who argue that credit lines do not provides firms any hedging benefits against fluctuation

in interest rate because credit lines, unlike fixed-rate loans, are typically quoted as a mark-up over a market interest rate.[15]

2.4.3   Drawdowns on Credit Lines

A drawback of the analysis in the previous section is that whilst the dependent variable is cumulative of the firm's decisions over a number of years, the independent variables, particularly characteristics of the individual firms, are more contemporary in nature. On the basis that the marginal financing approach is more appropriate to test theories that rely on time-variation in firm characteristics (see Denis and Mihov, 2003, Ooi, Ong and Li, 2010), we employ an incremental approach to link actual credit lines utilization decisions with the firm's characteristics prior to a material credit line utilization event.

The incremental technique requires identification of specific incidents where individual REITs actually increased their loan commitments, which we did using the following criterion: First, the sum involved must be more than US$5 million, and second, the increased loan commitment must constitute at least 1% of total assets.[16] Observations that passed this filter will be classified as having materially increased their credit utilization [1], whilst those that did not passed the test will be classified as the base group [0]. Using this filter, we managed to identify 2,524 events where the loan commitment was increased materially between 1992 and 2007. This represented 29.3% of the firm-quarter observations, and their distribution over the study period is tabulated in **Figure 2.4**.

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[15] Qi and Shockly (2006), similarly, observe that for both commitment and spot loans, firms consistently mark-up interest rates over a market-wide interest rate, such as LIBOR or prime rate.

[16] The regression results are robust to alternative cut-off points, namely US$10 million, US$20 million, and 5% of total assets, used to identify "material increase" in credit line utilization.

Figure 2.4: Number of material loan commitment increases by REITs during 1992-2007.
This chart plots the number of incidents where the outstanding loan commitments of individual REITs increased materially between 1992 and 2007. Only credit limit increases that involved more than US$5 million and constituted at least 1% of the REIT's total assets are classified as material events. In total, 2,524 such events took place over the sample period.
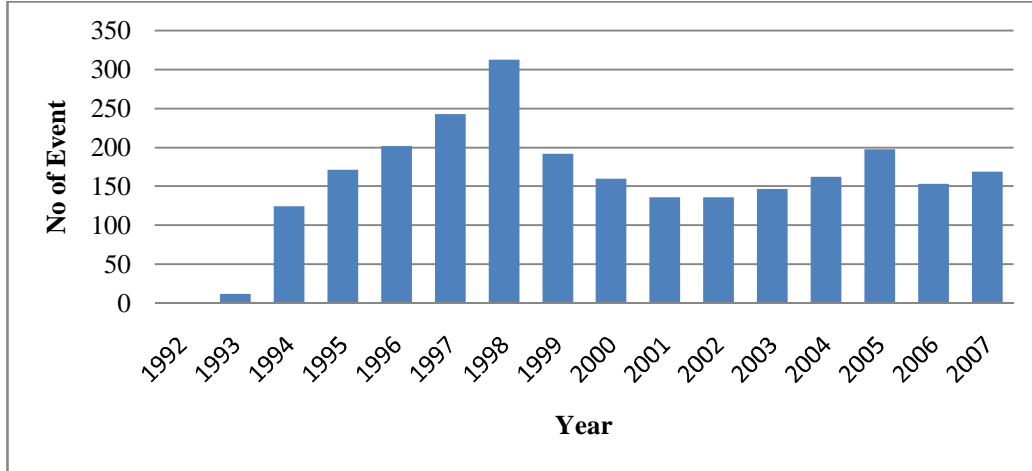
We employ the logistic regression model, which is suitable when the dependent variable involves a choice between two discrete alternatives, to determine which factors influence REITs' decision (and timing) to draw down on their credit lines. In addition to the set of variables defined earlier in Table 2.4, we also include a set of property-type dummy variables on the right-hand side of the logistic models. Model 3 is the base model, whilst Model 4 includes the current credit line utilization rate as an additional control variable. This variable is expected to be negatively related to the likelihood of REITs raising additional loan commitment in the current period. **Table 2.7** presents the estimation results of logistic regression models on the probability of individual REITs increasing their loan commitment. The sign and statistical significance for the explanatory variables remain largely unchanged in both models.

Table 2.7: Likelihood of REITs drawing down their Lines of Credit
The table presents the estimation results of logistic regression on the probability of increase in credit lines utilization. The dependent variable is a binary variable equals to one if the REIT's credit utilization increases materially. A material event refers to a net increase of more than US$ 5 million in the outstanding loan commitment of individual REITs. The sum involved must also be at least 1% of total assets. The independent variables are defined in Table 4. The unbalanced panel data covers 7,269 firm-quarter observations from 1992:Q1 to 2007:Q4. Z-statistics are reported in parentheses with the standard errors adjusted for heteroskedasticity. ***, **, and * refer to statistical significance at 1%, 5%, and 10%, respectively.

Explanatory Variables	Model 3	Model 4	Model 5
Constant	-3.960***	-1.976***	-2.396***
	(-11.14)	(-5.10)	(-5.96)
ΔCredit quality $_{t-1,t}$	-0.081***	-0.083***	-0.067***
	(-5.79)	(-5.69)	(-4.46)
Credit quality $_t$	0.009	-0.007	-0.010
	(1.12)	(-0.86)	(-1.16)
Size $_t$	0.525***	0.375***	0.396***
	(10.53)	(7.15)	(7.33)
Leverage $_t$	-0.034***	-0.025**	-0.023**
	(-2.93)	(-2.42)	(-2.26)
Growth opportunity $_t$	0.616***	0.326***	0.293***
	(6.33)	(3.17)	(2.78)
Cash holding $_t$	-28.648***	-31.995***	-33.440***
	(-13.56)	(-13.21)	(-12.98)
Age $_t$	-0.580***	-0.562***	-0.401***
	(-7.42)	(-7.04)	(-4.91)
Interest volatility $_t$	0.327	0.463**	0.557***
	(1.59)	(2.22)	(2.63)
Stock market return $_t$	1.465***	1.491***	1.209***
	(4.83)	(4.82)	(3.87)
Credit crunch $_t$	0.154*	0.144*	0.150*
	(1.92)	(1.74)	(1.79)
Credit utilization rate $_{t-1}$		-1.707***	-1.633***
		(-17.91)	(-17.04)
Net Investment $_t$			3.211***
			(7.73)
Property type dummies	Yes	Yes	Yes
Pseudo R^2	0.08	0.11	0.13
Number of Obs	7,368	7,269	7,269

The estimation results for our three key variables yield the same results as the static regressions in Table 2.6. Consistent with the insurance hypothesis that REITs experiencing a credit quality decline are more likely to draw down on the line of credits, we find a negative and

statistically significant coefficient for Δ *Credit Quality* $_{t-1,t}$.[17] Furthermore, the coefficient for *Credit Crunch* is positive and weakly significant. This is consistent with the prediction that REITs are more likely to draw down on their credit lines during a tight credit market.

The evidence also indicates that REITs with more cash holdings are less likely to increase their loan commitment, whilst firms with high growth opportunities are more likely to drawdown on their credit lines. These observations support the liquidity role of bank lines of credit. Other firm characteristics that have significant influence on the likelihood of REITs drawing down their credit lines are firm age, size and leverage ratio. A negative and significant coefficient for firm age implies that younger firms are more dependent on loan commitments. Due to their short track record, they have limited access to public debt and hence, need to rely more on relationship-banking. After controlling for firm age and other attributes, small-sized and highly leveraged REITs have lower propensity to draw down on their credit lines. These results imply that not all REITs have equal access to loan commitments, an issue which we will examine further in the next section.

The results of Model 3 and Model 4 show that, all else being equal, REITs have a higher propensity to issue loan commitments in a rising stock market and when they have more growth opportunity. Since these two variables may be positively related to investment activities, we re-estimate the logistic models with the inclusion of another explanatory variable, namely net investment activity of the firm in the same quarter. This serves as a check to ensure that our earlier results are not bias due to a missing variable. The results, reported under Model 5, show that the earlier findings, particularly the signs and statistical significance of the variables pinning

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[17] To test whether managers who may have inside information about firm quality and thus would increase usage prior to the release of information about a decline in quality, we also include the future credit change (Δ *Credit quality* $_{t,\,t+2}$) in one of the regressions. Whilst the prior results are robust to the inclusion of the extra variable, the coefficient for the new variable is not statistically significant. Thus, we find no evidence that credit usage is a signal of future credit deterioration. Nevertheless, in the subsequent tests, we do observe that REITs do plan ahead by expanding their credit limit when they expect a future decline in their credit quality.

the two research hypotheses are robust. Thus, the credit line's insurance and liquidity roles remain intact after controlling for investment activities undertaken by the individual firms.

The coefficient for the new variable, *Net Investment,* is also statistically significant and positive. This implies that REITs that engaged in new investments in the same quarter are likely to draw down on credit lines. It reinforces the importance of loan commitments in supporting the growth and expansion of the REIT sector as observed by Riddiough and Wu (2009).[18] Brown and Riddiough (2003) further posit that REITs employ credit lines to finance their investment and subsequently refinance the credit lines with public debt, which has longer maturity. To examine the dynamic relationship, **Figure 2.5** tracks the credit utilization rate before and after a material acquisition event.[19] The observed pattern of credit line utilization around an acquisition event again underscores the importance bank lines of credit play in supporting REITs' investment activities. Interestingly, the chart shows the median utilization rate increasing dramatically to 52% on the event quarter (from 29.4% in the preceding quarter). Thereafter, the utilization rate declined gradually over the next four quarters before settling at around 40%, which is close to the long-term median utilization rate of 42%. It is likely that the recapitalization is conducted with the purpose of restoring the unused portion of the lines of credit and preserving financial flexibility to support future acquisitions. The post-event downward trend is consistent with Brown and Riddiough's (2003) "bridging finance" story. Thus, REITs appear to employ lines of credit to take advantage of acquisition opportunities, and then refinance them with long-term bond or equity at appropriate time.

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[18] Campbell et al (2008), similarly, find REITs tend to establish new credit facilities in years when they have relatively large amounts of investments. They contend that REITs employ credit facilities to correct temporary shortfalls in funding caused by large investment needs.

[19] We identify an acquisition activity through the quarterly change in net real estate investment activity of individual REITs. Scaling the amount against total assets, an acquisition event is only classified as material if the ratio is equal to or bigger than 0.10. To avoid any confounding effects, only events that do not have any other material acquisitions one-year before and after the event are included.

Figure 2.5: Credit line utilization rate of REITs surrounding a material acquisition event.
This chart tracks the credit line utilization rate surrounding a material acquisition event. An acquisition activity is identified by the quarterly change in the individual REIT's net real estate investment activity scaled by total assets. An acquisition is only classified as material if the ratio is equal or bigger than 0.10. To avoid any confounding effects, only events that do not have any other material acquisitions one-year before and after the event date are included in the figure.
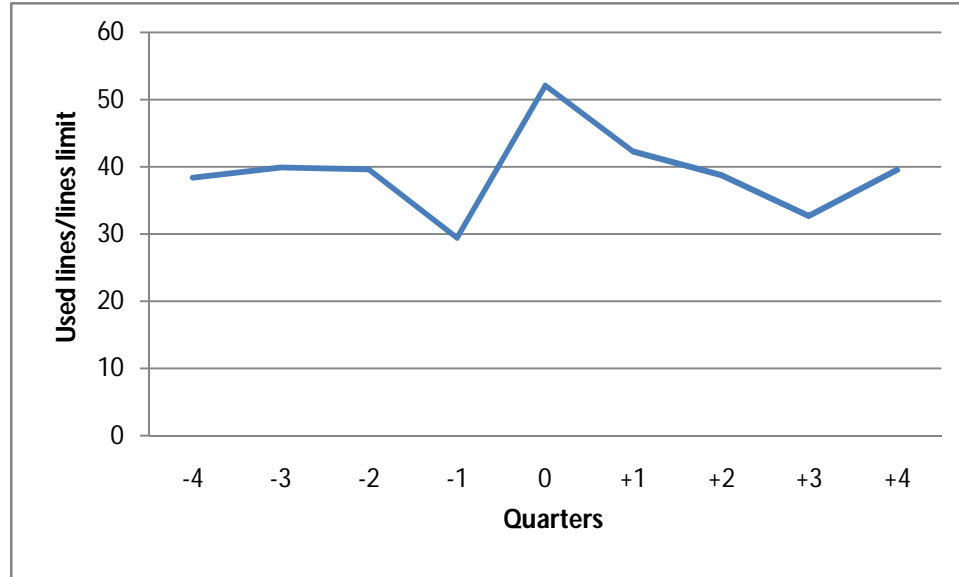
2.5   How Committed are the Loan Commitments?

So far, the results of both the static and logistic regressions consistently support the insurance role of bank lines of credit. In particular, REITs drawdown on their credit lines even after they have experienced credit deterioration at the firm-level. This is consistent with the notion that although MAC clauses are included in loan commitment agreements, banks seldom invoke them (Ergungor, 2000; Sufi, 2009). Nevertheless, we find some evidence in the earlier regressions suggesting that certain REITs may not be able draw down on their established credit lines; implying that the firms may not have equal access to loan commitments. To investigate this further, we introduce a set of interaction variables to examine the extent to which credit crisis, if it occurs, affects REITs differently. In particular, do some REITs enjoy the insurance protection associated with loan commitments more than others?

2.5.1 *Who Can Drawdown in a Credit Crisis?*

Firstly, we investigate the effectiveness of the insurance protection available for REITs of different sizes using interactive variables on change in credit quality (Δ *Credit Quality)*. Ranking the REITs in our sample according to their size, and categorizing those in the bottom 25 percentile as "*Small Firms*", we then multiply this variable with "Δ *Credit Quality"* to isolate the insurance value of credit lines for small firms. The results, as reported under Model 6 in **Table 2.8**, do not show any apparent differences. However, when the same variable is interacted against "*Credit Crunch*", the results are revealing. The coefficient for the interactive variable "*Small Firms*Credit Crunch*" shows a strong negative sign. Unlike their larger counterparts, smaller REITs may not be able to drawdown their credit lines in an illiquid capital market. In other words, in a credit crunch, smaller REITs may be the first to be rationed out of the capital market.

Table 2.8: The effect of firm size and credit quality on REITs' utilization of credit lines
The table presents the estimation results of logistic model on the probability of REITs increasing their credit lines utilization. The dependent variable is a binary variable equals to one if the REIT's credit utilization increases materially (defined as a net increase of more than US$ 5 million in the outstanding loan commitment of individual REITs and the sum involved must also be at least 1% of total assets). The right-hand side variables are defined in Table 4. In addition, the two proxies for the insurance hypotheses (Δ*Credit quality $_{t-1,\,t}$* and *Credit crunch$_t$*) are interacted with *Small firms* and *Low credit quality* (REITs in the bottom 25 percentiles). The unbalanced panel data covers 7,269 firm-quarters from 1992:Q1 to 2007:Q4. Z-statistics are reported in parentheses with the standard errors adjusted for heteroskedasticity. ***, **, and * refer to statistical significance at 1%, 5%, and 10%, respectively.

Explanatory Variables	Model 6	Model 7	Model 8
Constant	-2.167***	-2.328***	-2.113***
	(-5.36)	(-5.79)	(-5.22)
Δ Credit quality $_{t-1,\,t}$	-0.076***	-0.078***	-0.090***
	(-3.85)	(-4.44)	(-4.01)
Credit quality $_t$	-0.010	-0.014	-0.013
	(-1.15)	(-1.59)	(-1.53)
Size $_t$	0.355***	0.392***	0.353***
	(6.50)	(7.25)	(6.44)
Leverage $_t$	-0.023**	-0.020**	-0.020**
	(-2.27)	(-2.06)	(-2.07)
Growth opportunity $_t$	0.299***	0.271***	0.279***
	(2.84)	(2.57)	(2.64)
Cash holding $_t$	-33.440***	-33.290***	-33.417***
	(-12.97)	(-12.85)	(-12.89)
Age $_t$	-0.390***	-0.398***	-0.387***
	(-4.78)	(-4.87)	(-4.74)
Interest volatility $_t$	0.570***	0.541**	0.553***
	(2.68)	(2.54)	(2.59)
Stock market return $_t$	1.223***	1.179***	1.191***
	(3.90)	(3.76)	(3.79)
Credit crunch $_t$	0.227***	0.248***	0.317***
	(2.60)	(2.69)	(3.33)
Credit utilization rate $_{t-1}$	-1.644***	-1.638***	-1.649***
	(-17.11)	(-17.08)	(-17.16)
Net Investment $_t$	3.239***	3.221***	3.246***
	(7.91)	(7.77)	(7.94)
Small firms*ΔCredit quality $_{t-1,\,t}$	0.031		0.037
	(1.12)		(1.26)
Small firms*Credit crunch $_t$	-1.032***		-0.988***
	(2.77)		(-2.68)
Low credit quality*ΔCredit quality $_{t-1,\,t}$		0.091**	0.091**
		(2.03)	(2.17)
Low credit quality * Credit crunch $_t$		-0.461**	-0.434**
		(-2.32)	(-2.17)
Property type dummies	Yes	Yes	Yes
Pseudo R^2	0.13	0.13	0.13
Number of Obs	7,269	7,269	7,269

In Model 7, we repeated the interactive tests using credit quality instead of firm size. As we had done previously, we first sort the REITs according to their credit quality, and categorized those in the bottom 25 percentile as "*Low Credit*". These two variables are then interacted against "Δ*Credit Quality*" and "*Credit Crunch*". The estimation results for the interactive effects are stronger. Again, we find evidence that low credit quality REITs have problems drawing down on their credit lines in a tight credit market because they are more likely to breach the financial covenants attached to the credit lines. In addition, we find a strong positive coefficient for the interactive variable "*Low Credit*Δ*Credit Quality*". When interpreted together with the coefficient for Δ*Credit Quality*, the results suggest that whilst most REITs may be able to call on their credit lines following a credit decline, this may not apply for REITs with low credit standing. Thus, banks may selectively invoke the MAC clause on some borrowers, particularly those with higher default risk.

Model 8 in Table 2.8 include all the four interactive variables in the same logistic model. The results are essentially the same as those in Model 6 and Model 7. Overall, the regression results in Table 2.8 qualify the insurance coverage credit lines can offer to REITs against a credit crisis at both the firm- and market-level. Whilst large firms with high credit quality can still draw down on their lines of credit in bad times, risky firms may not be able to do so when capital is in shortage and expensive. Thus, the insurance role of loan commitments is not equal to all firms.

2.5.2   *Who can Increase their Credit Capacity?*

We now focus our attention on events where the credit lines of individual REITs are expanded. Our objective is to determine whether risky firms can actually get to increase their credit limit when facing a credit crisis. The main implication of the insurance story is that firms facing future credit risk, either at firm-specific level or at the broad market level, will try to hedge their position by arranging credit lines in advance. If the insurance hypothesis is correct, one could expect to see deterioration in the credit quality of borrowers following the issuance of credit lines.

Whilst the theory predicts that firms will be motivated to establish more lines of credit when they expect a worsening of the credit situation moving forward, the suppliers may be less willing to issue new or extend existing credit lines to them. Consequently, the relationship depends on the interaction between the two opposite forces.

Concentrating on the marginal decisions of REITs to increase their credit limit, we identify 1,086 material lines of credit issuance events between 1992 and 2007.[20] They represent 12.1% of the total observations. As before, a logistic regression on the probability of the individual REITs increasing their credit limit is estimated. We include the utilization rate of credit line as an additional control variable and predict that it would have a positively related to credit lines expansion events. In addition, the credit quality of individual REITs is tracked to measure the ex-ante future change in credit quality, which we define as the difference in firm's quarterly interest coverage ratio at *(t+2)* period minus *(t)* period to represent forward changes in the credit quality of the individual firms (Δ*Credit Quality*$_{t,t+2}$). We predict REITs which anticipate problem raising funds in the near future due an expected decline in their credit quality would seek to preserve their financial flexibility by maintaining a higher unutilized float or by expanding their credit limit in the current period.

The estimation results are presented in **Table 2.9.** The coefficient for Δ*Credit Quality*$_{t,t+2}$ is negative and statistically significant, implying that REITs plan ahead by expanding their credit limit when they expect a future decline in their credit quality. This is consistent with the insurance hypothesis that firms will try to insure against a possible future deterioration in their credit quality by expanding their credit limit and retaining a higher unutilized credit float to

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[20] The following set of criterion was employed: The sum involved must be more than $5million and the increased credit limit must constitute at least 1% of total assets. Firm-quarters that passed this filter will be classified as having materially increased their credit limit [1], whilst those that did not passed the test will be classified as the base group [0].

preserve their financial flexibility.[21] REITs are also more likely to increase their credit limit when the general stock market is doing well. In addition, newer firms with higher growth opportunities are also more inclined to increase their credit limit. Overall, these results are consistent with Agarwal, Ambrose and Liu's (2006) contention that borrowers with high expectations of future credit demand would utilize a smaller percentage of total credit availability, all else being equal. This is because borrowers who value the flexibility afforded by ready access to credit will preserve the option for future credit by retaining that option to increase their credit line utilization. Underlining the importance of credit line as a corporate liquidity tool for REITs, we also observe that REITs with low cash holdings are more likely to increase their credit limit.

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[21] This means that within a cross-section of firms, REITs expecting a future decline in their credit quality will place a higher value on credit line. REITs expecting a future increase in their credit quality, on the other hand, will place a lesser emphasis on credit line. Naturally, the presumption here is that managers could actually pre-empt their future credit quality deterioration.

Table 2.9: Probability of REITs' expanding their lines of credit

The table presents the estimation results of logistic regression on the probability of REITs expanding credit limits. The dependent variable is a binary variable equals to one if the REIT's credit limit increases materially, which refers to a net increase of more than $ 5 million in the credit limit and the sum involved must also be at least 1% of total assets. The independent variables are defined in Table 4. The unbalanced panel data covers 6,722 firm-quarter observations from 1992:Q1 to 2007:Q4. Z-statistics are reported in parentheses with the standard errors adjusted for heteroskedasticity. ***, **, and * refer to statistical significance at 1%, 5%, and 10%, respectively.

Explanatory Variables	Model 9	Model 10
	Dependent Variable: Increase Credit Limit, [1,0]	
Constant	-3.623***	-3.968***
	(-7.15)	(-7.52)
Δ Credit quality $_{t-1, t}$	-0.006	0.028
	(-0.42)	(1.25)
Credit quality $_t$	0.014	0.011
	(1.21)	(0.96)
Size $_t$	0.236***	0.220***
	(3.48)	(3.13)
Leverage $_t$	-0.060*	-0.053*
	(-1.94)	(-1.78)
Growth opportunity $_t$	0.667***	0.617***
	(5.25)	(4.67)
Cash holding $_t$	-4.301***	-5.219***
	(-2.85)	(-3.37)
Age $_t$	-0.732***	-0.503***
	(-6.70)	(-4.60)
Interest volatility $_t$	0.217	0.383
	(0.77)	(1.34)
Stock market return $_t$	1.400***	1.101***
	(3.33)	(2.57)
Credit crunch $_t$	0.022	0.160
	(0.17)	(1.11)
Credit utilization rate $_{t-1}$	0.620***	0.772***
	(4.65)	(5.63)
Δ Credit quality $_{t, t+2}$	-0.035**	-0.031*
	(-2.19)	(-1.92)
Net Investment $_t$		3.100***
		(11.01)
Small firms*ΔCredit quality $_{t-1, t}$		-0.036
		(-1.19)
Small firms*Credit crunch $_t$		-0.299
		(-1.19)
Low credit quality*ΔCredit quality $_{t-1, t}$		0.015
		(0.34)
Low credit quality * Credit crunch $_t$		-0.943**
		(-2.03)
Property type dummies	Yes	Yes
R^2	0.03	0.07
Number of Obs	6,722	6,722

Interestingly, we observe that the coefficients for Δ*Credit Quality*$_{t-1,t}$ and *Credit Crunch*$_t$ are not statistically significant. This indicates that REITs may not be able to expand their credit limits in a credit crisis. Furthermore, other firm characteristics that significantly impact the individual REIT's propensity to raise their credit line limits are firm size, leverage, growth opportunity and cash holdings. Interpreting the signs of these variables collectively, they highlight the challenges faced by risky REITs to expand their credit limit.

In summary, whilst credit lines can protect REITs against a credit crisis, the insurance protection is qualified in the sense that it may not accessible to all REITs all the time. Only those with low credit risk get to originate and expand their credit capacity. Furthermore, even when the credit lines are established, the firm's ability to draw down is also dependent on their credit quality as well as the liquidity in the credit market. Thus, risky firms may not be able to rely on bank lines of credit to give them the necessary protection from a credit crisis. Our results are consistent with Huang (2009) who find that credit lines provided only contingent and partial insurance for some borrowers during the recent subprime mortgage crisis. Thus, credit lines are not perfect substitute for cash holdings.

2.5.3   REIT Cash Holdings in a Credit Crisis

In this segment, we extend the study to explore the connection between cash holdings and credit line usage. **Table 2.10** presents the regression results for the determinants of REIT cash holdings. Model 11 is the base model. Consistent with the hypothesis that credit line is a substitute for cash, REIT cash holdings are negatively related to credit line utilized. Similar to Hardin et al. (2009), we observe that larger firms hold less cash. The coefficient for stock market performance is also negative. Overall, these results suggest that REITs with greater access to the capital market tend to hold less cash. Firms with higher growth opportunity also hold more cash. The coefficients for *Interest volatility* and *Credit crunch* are negative, which is inconsistent with the notion that firms facing high cash flow uncertainty prefer to hold more cash to preserve their financial flexibility

(Opler et al., 1999). These results are nevertheless not surprising - as observed in Table 2.2,

REITs rely heavily on credit line access for their liquidity management.

Table 2.10: The determinants of REIT cash holdings
The table presents the estimation results on the determinant of REIT cash holdings. The dependent variable is the cash holdings of individual REITs, which is defined as total cash and cash equivalent scaled by total assets. Models 11, 12 and 13 report the coefficient estimates from a two-way (firm and quarter fixed effects) panel regressions. Model 14 reports the estimation results of a two-stage least squares model where the line of credit use (Used line/Total assets) is instrumented with the lagged value of line of credit use. T-statistics are reported in parentheses, whilst ***, **, and * refer to statistical significance at 1%, 5%, and 10%, respectively.

Explanatory Variables	Model 11	Model 12	Model 13	Model 14
Constant	0.115***	0.110***	0.109***	0.101***
	(4.69)	(4.63)	(4.58)	(15.74)
Used line $_t$/Total assets $_t$	-0.064***	-0.065***	-0.065***	-0.090***
	(-6.30)	(-6.42)	(-6.40)	(-17.68)
ΔCredit quality $_{t-1, t}$	-0.000	-0.000	0.000	0.000
	(-1.04)	(-0.02)	(0.16)	(0.76)
Credit quality $_t$	0.001**	0.001**	0.001**	0.000
	(2.32)	(2.32)	(2.33)	(1.45)
Size $_t$	-0.015***	-0.014***	-0.014***	-0.013***
	(-3.29)	(-3.03)	(-2.98)	(15.75)
Leverage $_t$	-0.000	-0.000	-0.000	0.000**
	(-0.82)	(-0.77)	(-0.75)	(2.56)
Growth opportunity $_t$	0.007*	0.007	0.006	0.007***
	(1.88)	(1.58)	(1.55)	(3.24)
Age $_t$	0.005	0.008	-0.008	-0.002
	(0.96)	(-1.36)	(-1.38)	(-1.41)
Interest volatility $_t$	-0.018***	-0.017***	-0.017***	-0.016***
	(-3.84)	(-3.50)	(-3.56)	(-5.63)
Stock market return $_t$	-0.019***	-0.017***	-0.017***	-0.017***
	(-3.84)	(-3.07)	(-3.12)	(-4.35)
Credit crunch $_t$	-0.001*	-0.003***	-0.003***	-0.004***
	(-1.67)	(-3.12)	(-3.54)	(-3.93)
Net Investment $_t$	-0.006*	-0.004	-0.003	0.002
	(-1.75)	(-1.12)	(-1.07)	(0.84)
ΔCredit quality $_{t, t+2}$		0.000	0.000	-0.000
		(0.90)	(0.89)	(-1.14)
Small firms*ΔCredit quality $_{t, t+2}$			-0.001	-0.000
			(-1.19)	(-0.67)
Small firms*Credit crunch $_t$			0.004	0.002
			(1.14)	(0.59)
Low credit quality*ΔCredit quality $_{t, t+2}$			0.001*	0.003***
			(1.75)	(3.79)
Low credit quality * Credit crunch $_t$			-0.004	-0.001
			(-1.28)	(-0.37)
R^2	0.09	0.06	0.09	0.12
Number of Obs	7,503	6,903	6,903	6,742

In an equilibrium model, risky firms may recognize that credit lines might be pulled during financial crisis and thus would hold greater cash holdings to offset this risk. To test this possibility, we incorporate expected change in the firm's credit quality change *(ΔCredit quality $_{t, t+2}$)* to the base regression in Model 12. Whilst the results for the other variables are fairly robust, the coefficient for the new variable is not significantly different from zero indicating that REITs do not necessarily retain more cash to offset the risks from future deterioration in credit quality. To provide further insights on the liquidity management of REITs in a credit crisis, we control for size and credit quality by interacting our two credit crisis variables, namely *ΔCredit Quality $_{t, t+2}$* and *Credit Crunch*, with *Low Credit Quality* with *Small Firms*.[22] The estimation results using OLS with fixed effects as well as two-stage least squares (2SLS) estimators are reported under Model 13 and Model 14, respectively.[23] We do not find evidence that smaller sized REITs hoard significantly more cash than the larger REITs during a credit crisis. Nevertheless, the coefficient for the interactive variable *"Low credit quality*ΔCredit quality $_{t,t+2}$"* is positive and statistically significant in both models. This suggests that low credit quality REITs do not hold on to more cash despite facing the prospect of future credit deterioration. This observation coupled with our earlier results that they may not be able to draw down on their existing credit lines highlight the cash flow constraints faced by low credit quality REITs. Our results are robust when we control for potential endogeneity between cash holdings and line of credit. Model 14 also reveals that REITs employing more debt in their capital structure tend to hold more cash.

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[22] REITs in the sample are ranked according to their size as well as credit quality, and those in the bottom 25 percentile are classified as "Small Firms" and "Low Credit", respectively.

[23] Following Hardin et al. (2009), the 2SLS regression model is estimated to control for potential endogeneity between cash holdings and line of credit.

2.6   Conclusions

This paper examined the effectiveness of bank lines of credit in insulating REITs from a credit rationing at the broad market level as well as protecting them from credit risk deterioration at the firm level. Whilst the data covered both the origination and utilization of commitment loans by REITs between 1992 and 2007, our focus was primarily on the utilization of loan commitments.

The evidence consistently shows that line of credit does insure REITs against credit rationing at the broad market level. Specifically, REITs are more like draw down on their credit line in tight credit market. We also find evidence on the effectiveness of bank credit line in protecting REITs from firm-level credit quality deterioration. Further tests, however, revealed that the insurance ability is qualified in two ways: First, not every REIT can establish or expand their credit lines as and when they wish. Generally, it is difficult for most firms to extend their credit limit in bad times, much more so for the riskier firms. Second, low credit quality firms, due to possible violation of financial covenants, may not be able to draw down on their existing credit lines to hedge against credit deterioration.

Since loan commitment is a form of relationship loan, the current study also contributes to the relationship banking literature by identifying a unique source of the value of close relationships, that is, insurance value provided by the lenders against liquidity shocks during credit crises. We also provide another reason why REITs would continue to employ debt in their capital structure.[24] The study established that credit lines play an important role in the working capital and liquidity management of REITs. In particular, bank line of credit acts as a substitute

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[24] Numerous authors, such as Ooi, Ong and Li (2010) and Boudry, Kallberg and Liu (2010), have highlighted that REITs provide a useful setting to test capital structure theories because the key drivers behind the traditional capital structure theories are less significant in the case of REITs. Firstly, REITs do not pay corporate tax; consequently, the tax benefit associated with using debt, which is central to the trade-off models, is not so applicable in the REIT context. Secondly, equity REITs buy and hold properties, which are tangible and not firm-specific assets. Consequently, they are less exposed to bankruptcy and agency costs as compared to firms in other industries. Third, the transparent nature of REITs' operations implies lower information asymmetry between the insiders and outsiders. REITs also operate under more stringent corporate governance and reporting rules. Fourth, due to the high distribution requirement, REIT managers have less discretion to engage in managerial opportunism or over-investment activities. Even successful REITs have to raise capital externally and are, hence, subjected to frequent monitoring and disciplining in the capital market.

for cash holding and as a financial slack for future investment opportunities. Consistent with the unique institutional requirement of REITs having to pay out at least 90% of their net income as dividends, our data confirms that the REIT sector rely more heavily on bank lines of credit as compared to firms operating in other sectors. Commitment loan, as a proportion of total assets, have declined from its peak in the late 1990s when the credit market was flushed with liquidity. It is anticipated that bank line of credit will take a more prominent role in the corporate financial and liquidity management of REITs in today's market climate of tight liquidity.

CHAPTER THREE

SPONSOR BACKING IN ASIAN REIT IPOS

3.1 Introduction

Initial public offerings (IPOs) are a well researched and documented phenomenon in the finance literature.[1] Underpricing, where the first day closing price is above the offer price, is viewed as an anomaly because it is puzzling why IPO issuers would consistently leave money-on-the-table for investors. Numerous theoretical models have been developed to explain the anomaly, ranging from information asymmetry, institutional reasons, control considerations and behavioral explanations.

The two mainstream explanations for underpricing are based on adverse selection and signaling costs. Adverse selection-based models (Rock, 1986) postulate that IPOs must be underpriced to entice uninformed investors to purchase shares. Signaling-based models (Ibbotson, 1975; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989) hypothesize that IPO issuers are incentivized to "leave a good taste in the investor's mouths" because they will likely return to the market to sell securities. Empirical evidence in the finance and real estate literature supporting these models is mixed.[2]

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[1] See Ritter and Welch (2002) and Ljungqvist (2008) for comprehensive reviews on the IPO literature.

[2] Michaely and Shaw (1994) support the winner's curse argument proposed by Rock (1986) but find little support for the hypothesis that high-quality IPOs "leave money on the table" to signal their quality. In particular, they did not observe any evidence of a higher propensity to return to the market for a seasoned offering for firms that were more underpriced. Ghosh, Nag and Sirmans (2000), on the other hand, find that REITs that underpriced IPOs more are likely to issue seasoned equity sooner, which is consistent with the signaling models of IPO pricing in that during the post-IPO period, the market learns the firm's true worth such that good quality firms issue seasoned equity at favorable prices and recoup the loss sustained at IPO.

Given that underpricing is often viewed as evidence of agency costs (Gompers and Lerner, 1999; and Ljungqvist and Wilhelm, 2003), it is worthwhile to focus on a key player in the IPO process, namely the sponsor. Sponsors are pre-IPO shareholders / investors that often have board representations and have considerable discretion in setting the offer price for the IPO firm. Issuers typically capitalize on the strengths and reputation of its sponsors by carrying the sponsor brand name. The literature has examined the influence and roles of venture capital sponsors, private equity fund sponsors, and managers in the IPO (Barry et al. 1990; Gompers, 1996; Chemmmanur and Paeglis, 2005; and Katz, 2008), but not for REIT IPOs.

IPO sponsors are relevant for a number of reasons. First, sponsors may have private information not available to ordinary investors. Second, the interests of sponsors may conflict with that of investors in instances where sponsors are involved in the day-today management of the firm after their public listing. Third, the longer term strategy of the sponsor matters, that is, does the sponsor view the IPO as a one-off exit strategy or as a repeated-game with a focus on building long-term relationship with the IPO firm. In addition, the reputation of the sponsor matters as well. In order to overcome these problems, the sponsor may wish to signal that the IPO firm is of a high quality.

Although there are several ways to signal quality[3], two options that we explore in this chapter are the degree of underpricing and the proportion of shares retained by the sponsor. Unlike prior studies that have examined the issue of underpricing in isolation, we believe that the pricing decision and the quantity of shares to sell are decisions made jointly by the sponsor as motivated by Grinblatt and Hwang (1989).[4] Therefore, we model the two decisions jointly using a

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[3] Other ways to signal quality are through the reputation of the underwriters (Booth and Smith, 1986), auditors (Titman and Trueman, 1986), venture capitalists (Barry et al. 1990; Megginson and Weiss, 1991), management quality (Chemmanur and Paeglis, 2005).

[4] Exceptions are Michaely and Shaw (1994) who model the underpricing and the size of seasoned equity offerings jointly using a simultaneous equations model. Habib and Ljungqvist (2001) on the other hand model issuer wealth losses, underpricing, and the costs of promoting the issue jointly using equation-by-

2SLS simultaneous estimation with underpricing and proportion of shares retained as dependent variables.

Apart from signaling theories that explain underpricing in IPOs, there is also a burgeoning venture capital literature that finds that reputable sponsors provide quality certification for IPO firms (Megginson and Weiss, 1991; Barry, et al., 1990). The certification explanation posits that firms backed by high quality sponsors are underpriced less at the IPO. Because signaling and certification hypotheses have different predictions on the effect of sponsors on underpricing, these hypotheses are viewed as mutually exclusive.

The real estate investment trusts (REIT) IPO literature is also well developed, and the reasons for examining REITs have been well documented (see Ling and Ryngaert, 1997; Brounen and Eichholt, 2002). We focus on the IPOs of Asian REITs, which are especially promising as an empirical laboratory for several reasons. First, unlike most general firms and US REITs, Asian REITs are structured as captive REITs. That is, an independent asset management company, wholly owned by the sponsor, is set up to manage the REIT as an external manager. As such, sponsors have considerable influence over financing and investment policies. The captive management structure also tends to invite agency problems since REIT management fees are often pegged to the size of the portfolio under management. This provides an incentive for the sponsor to expand the portfolio possibly to the detriment of shareholder value. Second, Asian REITs are predominately backed by large corporations (72% of the sponsors in our sample are publicly listed companies).[5] The sponsors hold on average 19% of the IPO shares post-IPO.

Although the substantial shareholdings and size of the Asian REIT sponsors add credence to their roles in certifying and signaling IPO quality, many sponsors sell assets to the REITs post-

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equation OLS estimator. Unlike ours, both these studies treat the number of shares retained by the issuers as exogenous with respect to underpricing.

[5] One of the plausible reasons for the dominance of large REIT sponsors in Asia is the absence of ownership limitation such as the 5-50 rule imposed on US REITs where no more than five shareholders are allowed to hold more than 50% share of REIT. An exception is in the Japanese REIT market where no more than three of the shareholders are allowed to hold more than 50% share of REIT.

IPO, and in so doing, create a moral hazard problem for REIT investors. This moral hazard problem is aggravated for sponsors that are developers. Consequently, we exploit the variation in sponsor reputation (measured as the size and age of the sponsor) and ownership (number of shares held by the sponsor post-offering) to explain how certification, signaling and moral hazard considerations affect the level of underpricing and firm value.

The key findings of our empirical research are as follows. First, we find that the degree of underpricing and number of shares are indeed inter-related. In particular, the fraction of shares retained by the sponsor has a positive impact on underpricing. Similarly, underpricing has an impact on the numbers of shares retained by the sponsor. This is consistent with signaling hypothesis proposed by Grinblatt and Hwang (1989). Moreover, we find a positive relation between firm value and quality signals such as underpricing, sponsor ownership and sponsor reputation. Second, we also find evidence supporting the adverse selection model as the presence of institutional investors positively and significantly affects underpricing. Third, we find strong evidence that the underpricing of Asian REITs is driven by strong premarket demand; that is, underpricing is greater for firms that experienced heavy demand during the IPO road show. Fourth, we find evidence that developer sponsors tend to hold more shares in the REIT at IPO, ostensibly to compensate investors for the potential moral hazard problems post IPO.

The rest of the chapter proceeds as follows: In Section 3.2 we outline our literature review and research hypotheses. The data for Asian REIT IPOs and summary statistics are described in section 3.3. In Section 3.4, we discuss the empirical results. Section 3.5 provides a number of robustness tests and Section 3.6 concludes.

3.2   Literature Review and Research Hypotheses

The literature on the relation between sponsors and underpricing focuses on how the market reacts to the presence of sponsors. One view holds that reputable sponsors provide quality certification that reduces the asymmetry information between issuers and outsiders, thus lowering

the costs of going public (underpricing). The venture capital literature has shown that IPOs sponsored by venture capitalists incur less underpricing and lower underwriting spreads compared to non-venture backed IPOs. This is attributed to venture capitalists' third party certification (Megginson and Weiss, 1991). The quality of monitoring or certification is also related to the number of shares retained by the sponsor at IPO. A higher percentage of equity retained by sponsors should correlate with monitoring quality (Barry, et al., 1990) and act as a bonding mechanism for credible certification (Megginson and Weiss, 1991). Barry, et al.'s (1990) monitoring hypothesis predicts that capital markets recognize high quality monitors by requiring a lower underpricing for issues with large sponsor ownership at IPO. Since both certification and monitoring by sponsors will lead to similar predictions, we refer to both roles as "certification". This leads us to the following certification hypothesis:

Hypothesis 1 *(a) Sponsor reputation is negatively related to underpricing.*

(b) Sponsor ownership is negatively related to underpricing.

Investors may, however, discount the credibility of sponsor certification. This is particularly true in the context of captive REITs in Asia and the associated post-IPO moral hazard issues. Thus, the inherent conflict of interest attributed to the sponsor requires a higher underpricing. Sponsors with private information could end up being forced to signal their quality type by underpricing or demonstrating commitment such as share ownership to alleviate the concerns of agency issues. According to the signaling theory, quality firms deliberately underprice their IPO to distinguish themselves from other poor quality issuers (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; and Welch, 1989). Grinblatt and Hwang's (1989) model implies that the decisions of how much to leave on the table and how many shares to hold are not independent of each other since firm use both underpricing and share retention to signal their quality type. The signaling hypothesis yields the following predictions.

Hypothesis 2 *(a) Sponsor reputation is positively related to underpricing*

(b) Sponsor ownership is positively related to underpricing

The implicit assumption in signaling hypothesis is that quality signals such as sponsor reputation, sponsor ownership and IPO underpricing are associated with firm quality. In other word, IPOs backed by quality sponsors and that are more underpriced tend to be quality issues. These assertions are backed by theoretical literature. For example, Leland and Pyle (1977) predict a positive relation between firm value and the fraction of shares held by the issuers. Grinblatt and Hwang's (1989) model, on the other hand, predicts a positive relation between the value of the firm and the degree of underpricing. Existing empirical evidence generally supports the positive relation between firm quality and equity retained by insiders (Downes and Heinkel, 1982), firm quality and underwriter reputation (Carter and Manaster, 1990; and Michaely and Shaw, 1994), and firm quality and underpricing (Cai, Duxbury and Keasey, 2007).

Following Gompers and Lerners (1999) and Cai, Duxbury and Keasey (2007), we use the success or failure of sponsors as our measure of firm value.[6] Successful sponsors are defined as those who maintain their ownership in the REIT and their asset management company during the first three years after the IPO. Failed sponsors are defined as those who liquidated or disposed their interest in the REIT and the asset management companies during this period. *Ceteris paribus*, high quality firms-backed by reputable sponsors and with high sponsor ownership-would be expected to be sponsored by successful sponsors while low quality firms are backed by failed sponsors. This leads to the following hypothesis:

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[6] Cai, Duxbury and Keasey (2007) use the success and failure of internet-related firms during the *dotcom* periods as proxy to high and low quality firms, respectively. Firms that maintain their listing status within the first five years of offering are deemed as successful, while firms that delisted from the exchange are failed firms. In a similar fashion, Gompers and Lerners (1999) use the incidence of liquidation in a sample of venture capital backed IPOs within the first five years of public listing as proxy to IPO firms' long-run performance. We use three years instead due to the relative short history of REITs in Asia.

***Hypothesis 2** (c) Firm value (successful sponsors) is positively related to sponsor ownership, sponsor reputation and underpricing.*

Post-listing support by the sponsor is important for REITs in terms of future growth opportunities.[7] This is particularly true in the context of Asia where REITs are known to pursue aggressive acquisition strategies to boost earnings and dividends (Ooi, Ong and Neo, 2011). It is reasonable to expect that developer sponsored REITs have greater growth opportunities given the pipeline and warehousing support from developer sponsors. Although such support is not unique to developer sponsored REITs, we expect that support from developers is superior given their ability to develop their own properties and their sizable portfolio of investment properties that may be transferred to the REIT at the appropriate time.

The better growth opportunities enjoyed by developer sponsored REITs naturally translate into more post-IPO related-party transactions (RPTs) between the sponsor and the REIT. This raises agency concerns in that the affiliated party transactions may be detrimental to shareholder value. Demsetz and Lehn (1985) argue that the scope of moral hazard is greater for managers of riskier firms. To align incentives with other shareholders, riskier managers should hold higher ownership stakes. We therefore expect developer sponsors to hold more shares in the REIT to alleviate sponsor-shareholder conflicts. The above arguments lead us to the following commitment hypothesis:

***Hypothesis 3** (a) Developer sponsored REITs tend to experience greater growth opportunities, hence (b) developer sponsors tend to hold more shares in the REIT.*

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[7] Broadly, sponsors provides three types of support to the REIT – pipeline support, warehousing facility and management expertise – that are formalized into various sponsor support agreements. Pipeline support involves the provision of first-preference right to information and negotiation of the disposed properties owned by the sponsor or related companies. Warehousing facility involves the temporary acquisition of properties by the sponsor when the REIT is not able to immediately acquire the properties for reasons such as financial constraints, properties that are still under development and issues related low vacancy rate. Sponsors can also provide fee-based management expertise to the REIT

3.3 Data and Summary Statistics

3.3.1 Sample and Data Collection

Our sample consists of Asian REIT IPOs from 2001 to 2008. The sample includes Japan, Singapore, Hong Kong and Malaysia REITs with a total market capitalization of US$52.9 billion as of end of June 2009. This sample represents over 94% of the total listed REITs in Asia based on market value in the corresponding period. We exclude South Korea, Taiwan and Thailand REIT markets from our study due to the closed-end and finite-live (South Korea) structure of these markets. The final sample comprises 78 IPOs after excluding three IPOs (CapitaCommercial Trust, K-REIT Asia, and Ascott Residence REIT) that represent shares spin-off from their holding company.

To obtain the identity of the sponsor (sometimes referred to as the advisor), we examine the prospectus and the first financial reports of each REIT. We define a pre-IPO shareholder as a sponsor if (a) it is so identified in the prospectus notes, or (b) it holds shares in the asset management company.[8] Such a definition is consistent with the REIT institutional background in Asia where the asset management company is usually a wholly-owned subsidiary of the sponsor. We collect information about the aggregate stock ownership by the REIT sponsor from first fiscal financial reports (6 months from IPO date, on average).[9] We define the main sponsor as the sponsor with the largest shareholdings in the asset management company. Following the venture capital literature (Barry, et al., 1990), we use two proxies for sponsor reputation: sponsor size,

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[8] This sponsor definition does not differentiate between sponsors and advisors even though there are a few isolated instances where advisors are not sponsors. However, because these advisors hold large stakes in the REIT, we classify them as sponsors. The results are robust when we use main sponsor ownership in the REIT instead of aggregating all shares owned by all the sponsors / advisors.

[9] Our decision to use first fiscal report ownership data is due to the language constraint in extracting Japan REIT (JREIT) ownership data on IPO date. We expect that the first fiscal ownership data is a close proxy to ownership structure on IPO date due to locked-up provisions imposed on issuers by underwriters in Asian stock markets. Firm management and pre-IPO shareholders (sponsors) are often not allowed to dispose their shares in the aftermarket for a period of time after the IPO (typically 180 days). Inspection of non-JREIT sample where we have both ownership data at and post IPO show that the correlation for these variables is 0.90 (significant at less than 1% level). Moreover, tracking of JREITs ownership data over time reveals that sponsor ownership does not change during the first two fiscal periods (1 year).

which measures the main sponsor's total shareholders' fund during IPO year; and sponsor age, defined as the number of calendar years between the IPO and main sponsor's founding year.

3.3.2 Summary Statistics

Table 3.1 reports the Asian REIT IPO activity from 2001 to 2008. IPO activity increased significantly in 2005 and 2006 with 21 and 26 offerings, respectively. The pace of new issues slowed following the global financial crisis in 2007 and 2008. There were no REIT IPOs in 2009. The 78 IPOs raised nearly US$26.1 billion during the period. At US$16.5 billion, total proceeds raised during the peak periods in 2005-2006 are comparable to the US REIT IPO boom periods (1993-1994) of US$14.3 billion (Ling and Ryngaert, 1997).

Table 3.1: Asian REIT IPOs issued during 2001-2008

Year	2001	2002	2003	2004	2005	2006	2007	2008
Total IPO	2	6	5	7	21	26	13	1
Partitioned by country								
Japan	2	4	4	5	13	12	2	0
Singapore REIT	--	2	1	2	2	8	5	1
Hong Kong REIT	--	--	--	--	3	2	2	0
Malaysia REIT	--	--	--	--	3	4	4	0
Total amount raised (in USD millions)	1,122	1,380	1,850	2,336*	8,217	8,261*	2,775	192

* excluding three Singapore REIT IPOs which were spun-off from their parent companies with IPO shares offered to parent's shareholders (Capital Commercial Trust, 2004; K-REIT, 2006; and Ascott Residence Trust, 2006)

Table 3.2 shows the average initial-day returns for the full sample and disaggregated by country of origin. The initial return is measured as the percentage difference between the offer price and the closing price at the end of the first day of trading. On average, Asian REITs are underpriced by 3.1% (t-statistics=2.19). Ling and Ryngaert (1997) reported underpricing of 3.6% among US REIT IPOs issued during 1991-1994.

Table 3.2: Summary statistics on initial-day returns

Sample	Sample Size	Mean return	Std.dev	t-stat	Median return	Minimum return	Maximum return
Full sample	78	0.031**	0.127	2.189	0.010	-0.160	0.590
Partitioned by country							
Japan (JREIT)	42	0.015	0.096	0.983	0.003	-0.111	0.416
Singapore REIT (SREIT)	18	0.054	0.181	1.274	0.020	-0.150	0.590
Hong Kong REIT (HREIT)	7	0.027	0.137	0.518	0.004	-0.157	0.204
Malaysia REIT (MREIT)	11	0.061*	0.125	1.637	0.040	-0.110	0.344

** and * indicates significance at the 5% and 10% level respectively.

The characteristics of the IPO firms together with their definitions are presented in **Table 3.3** and **Table 3.4** respectively. The pair-wise correlation matrix for selected characteristics that we used as explanatory variables in OLS regressions in the next section is reported in **Table 3.5**. The magnitude of the coefficients suggests that the independent variables are not highly collinear.

Table 3.3 shows that the sponsors in our sample have an average size of US$5.4 billion. Over 72% are publicly listed, suggesting that the sponsors are well established. At 19.4% post-IPO sponsor equity ownership in the REIT is substantial compared to venture capital sponsor post-IPO holdings of 24.6%, 26.3% and 23.4% as reported by Barry, et al. (1990), Megginson and Weiss (1991), and Gompers and Lerner (1999), respectively. Over 92% (0.178/0.194) of the sponsor ownership is held by the main sponsor, indicating that REIT sponsors typically take concentrated equity positions in the IPO. Over half of the IPOs are sponsored by developers, underscoring the importance of the REIT structure as an exit vehicle for developers.

Our sample of REIT IPOs tends to be larger than their US counterparts. The mean issue size for Asian REIT IPOs of US$318 million is substantially larger than the US$176 million and US$190 million issue size reported by Ling and Ryngaert (1997) and Highfield, Roskelley and Steele (2008) respectively, as well as those in Europe (Brounen and Eichholtz, 2002). *Underwriters reputation* is captured by lead underwriter's market share measure as the ratio of lead underwriters' total IPO proceeds raised in the IPO year to total IPOs proceeds raised by all other underwriters in the Asia Pacific region during the same period. On average, the lead

underwriters command a market share of 4.5%. More than 26% of the IPOs represent the *First issue* of a given property type in its country of origin. Office IPOs are the most common property type comprising of 22% of the total IPOs. *Institutional holdings* is the percentage of shares held by financial institutions post-IPO. For non-JREITs, we use data from the IPO prospectus since most of the non-JREITs do not provide data on institutional holdings in their financial reports post-IPO. The average institutional holdings of 45% is comparable to the 44% reported by Hartzell, Kallberg and Liu (2004) using a sample of US REIT IPOs during 1991-1998.

Lag market return of 0.7% represents the cumulative stock market index returns for the 15 days prior to the date of issue. *Premarket demand* is the absolute percent change in the actual offer price from the middle point of book-building price range which serves as proxy to premarket demand. The average price revision from the mid-point of 1.7% (median: 2.0%) is larger than those reported by Highfield, Roskelly and Steele (2008) of -2.58% (median: 0%) implying that Asian REIT IPOs tend to receive stronger premarket demand than US REIT IPOs. *Premarket demand (0,1)* shows that more than 70% of the IPOs (sample with book-building price range data) are priced at the maximum of book-building price range.

Table 3.3: IPO characteristics
We define a pre-IPO shareholder as a sponsor if (a) so defined in the prospectus notes, or (b) it holds the shares in the asset management company. We use main sponsor's size (shareholders' fund) and age (years) as proxy to reputation. We define main sponsor as sponsor with the largest shareholdings in the asset management company. *Sponsor ownership* is the aggregate stock ownership of sponsors collected from REIT's first fiscal business reports (6 months from IPO, on average). Other variables' definition are in Table 3.4.

Sample	Full sample (N=78)					
	Mean	Median	Minimum	Maximum	Std.dev	Observation
Sponsor characteristics						
Sponsor reputation (size: million of $)	5,414	1,165	0.5	56,095	9,977	73
Sponsor reputation (age in years)	45	33	2	177	38	74
Listed (0,1)	0.718	1.00	0	1	0.453	78
Sponsor ownership	0.194	0.123	0	0.709	0.183	78
Main sponsor ownership	0.178	0.100	0	0.709	0.181	78
Developer IPOs (0,1)	0.500	0	0	1	0.503	78
Issue characteristics						
Issue size (million of $)	318	243	22	2,558	331	78
Underwriters reputation	0.045	0.042	0.001	0.172	0.033	78
Stock volatility	0.013	0.012	0.004	0.037	0.007	78
First issue	0.256	0	0	1	0.439	78
Office	0.218	0	0	1	0.416	78
Institutional holdings	0.448	0.463	0.039	0.921	0.183	78
Lag market return	0.007	0.009	-0.106	0.210	0.052	78
Premarket demand	0.017	0.020	-0.115	0.094	0.033	67
Premarket demand (0,1)	0.701	1.000	0	1	0.461	67

Table 3.4: Definitions of variables

Sponsor characteristics	Data Source	Description
Sponsor reputation (size)	Company website and annual reports	Main sponsor's shareholders' fund at IPO year
Sponsor reputation (age)	Company website & annual reports	Main sponsor's age measured as the number of calendar years between the IPO and main sponsor's founding year
Sponsor ownership	First fiscal financial reports	Log (1+ aggregate stock ownership of all sponsors at the first fiscal period after IPO)
Listed (0,1)	Company website & annual reports	Binary variable takes one if the main sponsor is a public listed company
Developer IPO (0,1)	Company website & annual reports	Binary variable takes one for IPO sponsored by developer (main sponsor)
Offering characteristics	**Data Source**	**Description**
Underpricing	Bloomberg	(IPO closing price-offering price)/Offering price
Issue size	Bloomberg	Log (number of shares offered*offer price)
Stock volatility	Bloomberg	The standard deviation of the stock returns from day 2 to day 60 after the IPO
Underwriter reputation	Bloomberg	The ratio of lead underwriters' IPO proceeds to total IPOs proceeds raised by all other underwriters in the Asia Pacific region.
First issue (0,1)	Annual reports	Binary variable takes one for first issue of REIT of its property type in its country of origin
Office (0,1)	Annual reports	Binary variable takes one for office REIT
Institutional holdings (JREITs)	First fiscal financial reports	Percentage of shares held by domestics financial institutions at the first fiscal period after IPO
Institutional holdings (non-JREITs)	Prospectus	The ratio of total shares placed to institutional investors to the total shares outstanding at IPO
Lag market return	Bloomberg	The cumulative stock market returns (Nikkei 225 for JREIT, Straits Times Index for SREIT, Hang Seng Index for HREIT and Kuala Lumpur Composite Index for MREIT) 15 days prior to IPO
Premarket demand	Bloomberg	Midpoint of offering range/offer price. The midpoint is measured as the high end + low end of offering range scaled by 2.
Premarket demand (0,1)	Bloomberg	Binary variable takes one for offer price that priced at the upper end (maximum) of filling range
Growth opportunity	Bloomberg	[(market value of equity + total debts)/total assets] at IPO.
Book-to-market ratio	Bloomberg	[book value of equity/market value of equity] at IPO
Firm size	Bloomberg	Natural of individual REIT's market capitalization at IPO date (total shares outstanding X closing price at the first day of trading)
Wealth change	Prospectus/ Bloomberg	Sponsor ownership *(First day closing market price-midpoint of filling price range)

Table 3.5: Pearson correlation matrix of the explanatory variables
This table presents a matrix of the pair-wise correlations of the explanatory variables in the regression models.

	Sponsor reputation	Sponsor ownership	Issue size	Underwriters	Stock Volatility	First issue	Office	Institutional holdings	Lag market returns	Premarket demand
Sponsor reputation (size)	1.000									
Log (1+ Sponsor ownership)	0.162	1.000								
Log (Issue size)	0.230*	-0.312*	1.000							
Underwriter reputation	-0.010	-0.298*	0.555*	1.000						
Stock volatility	0.226	0.240*	-0.001	0.080	1.000					
First issue	0.172	0.273	-0.241*	-0.030	0.062	1.000				
Office (0,1)	0.094	-0.056	0.182	0.094	0.081	-0.073	1.000			
Institutional holdings	0.244*	-0.197	0.106	-0.076	0.128	-0.031	0.075	1.000		
Lag market returns	0.148	0.092	-0.290*	-0.162	0.048	0.288*	-0.196	0.177	1.000	
Premarket demand	0.149	-0.111	0.060	0.163	0.094	-0.111	-0.013	0.097	0.034	1.000

* indicating statistical significance at 5% level

3.4 Results and Methods

Our empirical analysis focuses on three potential roles of sponsors previously discussed: certification, signaling and commitment. Univariate analyses are first carried out to examine the relationship between underpricing and its explanatory factors with a focus on *sponsor reputation* and *sponsor ownership* before expanding the analyses to a multivariate framework.

3.4.1 Univariate Analysis Results

In **Table 3.6** we report the IPO characteristics by splitting the full sample according to whether the first-day return is positive (underpricing) or negative (overpricing).[10] We find that IPOs that are underpriced tend to have higher *Sponsor reputation* and *Sponsor ownership,* which is consistent with signaling theory's predictions. We use sponsor size as proxy for reputation in subsequent multivariate tests; however, our results are robust to using sponsor age as a proxy.

Consistent with the winner's curse hypothesis, underpricing is higher for IPOs that attract more *Institutional holdings*. Other controls for risk such as *First issue* and *Office* have the predicted signs. Similar to Ling and Ryngaert (1997), we also find that *Office* REIT IPOs - the most common property type - tend to be less underpriced because of investors' familiarity with these issues. *First issue* of a given property type tend to be underpriced more, probably due to the valuation uncertainty surrounding these IPOs. *Stock volatility*, *Issue size*, *Underwriter reputation*, *Lag market return* do not vary between underpriced and overpriced IPOs.

It is worth noting that we control for premarket interest in the IPO, which is captured by the positive price revision in the offer price.[11] It is important to do so since underpricing may

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[10] The subsequent univariate and multivariate results remain unchanged after taking out two of the outliers (-0.16 and 0.59) that represent, respectively, the bottom and top 1% of initial returns in the sample.

[11] There are two explanations to the positive relation between premarket demand and underpricing. Benveniste and Spindt's (1989) model of IPO underpricing argue that partial adjustment phenomenon happens when the IPO final offer price do not fully reflect the positive premarket demand as the underwriters wish to reward institutional investors for truthfully revealing their true positive demand during the book-building process by offering them underpriced shares. Loughran and Ritter (2002) on the other

simply reflect the substantial increases in the first day closing price driven by the strong demand in the secondary market.[12] Hanley (1993) shows that underpricing is related to the partial adjustment phenomenon where issues that exceed the limits of the book building offer range (indicating strong premarket interest) are more underpriced. The two variables constructed to capture the extent (*Premarket demand*) and existence of positive price revision (*Premarket demand (0,1)*) reveal that issues that attract greater premarket interest tend to be more underpriced, although the result is only statistically significant for *Premarket demand (0,1)*.

Table 3.6: IPO characteristics by initial returns.
The IPO sample is divided according to whether the first-day return is positive or negative. *Sponsor ownership* is equal to the natural log of one plus the aggregate stock ownership of sponsors collected from REIT's first fiscal business reports (6 months from IPO, on average). Sponsor reputation is measured as the natural log of main sponsor's total shareholders' fund (for size) and as the natural log of total number of calendar years between the IPO and the main sponsor founding year (for age). T-statistics are calculated under the assumption of an equal variance. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level respectively. All variables are defined in Table 3.4.

	Underpricing (>0) Underpriced	Underpricing (≤0) Overpriced	T-statistics
Sponsor characteristics			
Sponsor reputation [size]#	3.134	2.705	-1.745**
Sponsor reputation [age]#	1.541	1.408	-1.347*
Sponsor ownership#	0.089	0.052	-2.682***
Offering characteristics			
Issue size	2.370	2.294	-0.822
Underwriters reputation	0.043	0.048	0.631
Stock volatility	0.014	0.013	-0.340
First issue (0,1)	0.349	0.143	-2.104**
Office (0,1)	0.116	0.343	2.474***
Institutional holdings	0.485	0.402	-2.023**
Lag market return	0.010	0.002	-0.722
Premarket demand#	0.021	0.012	-1.141

hand suggest that a positive upward revision implies that pre-IPO shareholders are experiencing increase in wealth much higher than they have anticipated, hence, they are more willing to tolerate for a higher level of underpricing than following an downward revision in the final offer price. Both these models predict a positive relationship between underpricing and premarket demand. We attempt to disentangle these theories in a subsequent section.

[12] To the best of our knowledge, the REIT IPO literature generally does not include proxy for premarket demand as one of the explanatory variable to underpricing. One exception is a working paper by Highfield, Roskelley and Steele (2008) in which the authors find that the degree of underpricing of US REIT IPOs is positively related to the premarket demand.

Premarket demand (0,1)#	0.821	0.536	-2.600***
No of observations	43	35	

there is missing value problems associated with these variables.

3.4.2   2SLS Estimation Results

We next examine the impact of sponsors on IPO underpricing in a multivariate framework. We estimate IPO underpricing and sponsor ownership jointly using a 2SLS simultaneous equation model. Following Riddiough and Wu (2009), we pool all non-endogenous variables as instruments for the endogenous variables. This approach is conservative because it can increase the standard errors of the endogenous variables (Riddiough and Wu, 2009).[13] We test the main proposition of a positive association between the degree of underpricing and the fraction of shares held by the sponsor in the new issue as theorized in signaling model. This produces the following simultaneous equation system:

$$Underpricing = \alpha + \beta_1 Log(1+Sponsor\ ownership) + \beta_2 Log(Sponsor\ reputation) + \beta_3 Log(Issue\ size) + \beta_4 Underwriter\ reputation + \beta_5 Stock\ volatility + \beta_6 First\ issue + \beta_7 Office + \beta_8 Institutional\ holdings + \beta_9 Lag\ market\ return + \beta_{10} Premarket\ demand + {}_{\beta 11-13} Country\ dummies + \varepsilon \qquad (1)$$

$$Log(1+Sponsor\ ownership) = \alpha + \beta_1 Underpricing + \beta_2 Stock\ volatility + \beta_3 Institutional\ holdings + \beta_4 Premarket\ demand + \beta_5 Developer\ IPOs + \beta_6 Log(Firm\ size) + \beta_7 Growth\ opportunity + \beta_{8-10} Country\ dummies + \varepsilon \qquad (2)$$

In the first equation, the dependent variable is the level of underpricing and the two key independent variables are *Sponsor reputation* and *Sponsor ownership*. For the signaling hypotheses to hold, we would expect to find β_1 and β_2 to be positive and significant. On the contrary, negative and significant signs for these estimated coefficients would support the

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[13] Similar to Riddiough and Wu (2009), we also reproduce our 2SLS results using an iterated 2SLS procedure which iterates over the estimated disturbance covariance matrix and parameter estimates until the parameter estimates converge. This procedure minimizes the sum of squared errors. Our results are robust to this estimation procedure (results not produced here but are available upon request from the author).

certification hypothesis. Other control variables used in the underpricing equation are similar in spirit to Ling and Ryngaert (1997). As motivated by Hanley (1993), we use the absolute revision in offer price (*Premarket demand*) as a proxy for premarket interest in the IPO. This variable is measured as the percentage difference between the midpoint of the filling range and offer price.

In the second equation, the dependent variable is the *Sponsor ownership* and the key independent variables are the level of underpricing and the *Developer IPO* dummy which is equal one if the main sponsor is a property developer. We hypothesize that developer sponsors hold more shares in the REIT to compensate investors for potential moral hazard issues.[14] Kahn and Winton (1996) on the other hand model pre-IPO shareholders retention as a function of growth opportunities. Their model predicts a negative relationship between growth opportunities and the original owners' share retention; that is, high growth firms tend to sell more shares to finance their growth. We use market-to-book ratio as proxy for growth opportunity.

We also control for *Premarket demand* in the sponsor ownership equation because Loughran and Ritter (2002) document that sponsors adjust their share retention ratio so that the wealth gain from premarket demand (positive revision in offer price) exceeds the dilution effect from underpricing.[15] This critical level is, in turn, dependent on the difference between IPO offer price and midpoint of book-building price range, IPOs with zero or positive price revision (offer price $\geq$ midpoint) tend to have lower critical value than IPOs with negative price revision (offer

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[14] Although not reported here, we document a positive and significant (at the 5% level) relation between growth opportunity (market-to-book ratio) and developer IPOs after controlling for factors such as cash flow, firm size, institutional holdings, sponsor ownership, leverage, property and country dummies.

[15] To illustrate wealth gain and dilution costs of underpricing, consider CapitaRetail China Trust's December, 8, 2006 offering that had 191.23 million shares retained by its sponsor, i.e. CapitaLand, 193.3 million newly issued shares (no secondary shares sold by pre-IPO shareholders) in its offering at $1.13. The first closing market price was $1.80, and the midpoint of the file price range was $1.04. So for the 191.23 million shares retained, the revaluation of $0.76 ($1.80-$1.04) per share resulted in a wealth gain of $145.33 million (191.23 million x $0.76). Thus the total wealth change was $145.53 million for the sponsors, as contrasted with the $112.29 million left on the table [($1.80-1.13) x 193.3=129.51] x 86.7% owned shares by the sponsors before going public]. Although the sponsor left $112.29 million on the table, the wealth gain of $145.53 million more than offsets the dilution costs from underpricing, providing a net wealth gain of $33.2 million.

price < midpoint). This leads to a negative relationship between *Premarket demand* and the number of shares retained by pre-IPO shareholders.

Other control variables in second equation include firm size and risk (Demsetz and Lehn, 1985). We use the natural log of individual REIT market capitalization at IPO as a proxy for size (*Firm size*), and the daily stock return volatility from day 2 to day 60 after the IPO as proxy for risks (*Stock volatility*). We also control for institutional ownership because IPOs with a stronger governance structure (high sponsor ownership) may attract more institutional ownership (Hartzell, Kallberg and Liu, 2004).

We report our 2SLS estimation results in **Table 3.7**.[16] Note that for Models 1 and 3 in Table 3.7, we omit the *Premarket demand* as there are missing values associated with this variable, reducing the overall sample size from 73 to 64.

3.4.2.1 Joint Decisions of Underpricing and Sponsor Ownership

The estimated coefficients on *Underpricing* and *Sponsor ownership* are of considerable interest. We find evidence that the decision to underprice is interrelated with the decision to retain shares in the REIT as theorized in Grinblatt and Hwang's (1989) signaling model. The estimated coefficients on *Underpricing* and *Sponsor ownership* are both positive and significant at the 1%-5% level across Models 1-4 in Table 3.7. [17]

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[16] The endogenous variables, *Underpricing* and *Sponsor ownership,* are estimated in the first stage. From the estimates, we obtain reduced form fitted values for each of the endogenous variables. The second stage estimates involve the substitution of reduced form fitted values for the endogenous variables appearing on the right-hand side of equations (1) and (2) and then estimating these equations using OLS.

[17] Our results are robust to smaller sample size of 64 (after omitting observations without *Premarket demand* data). In this case, *Sponsor ownership* coefficient is positive and significant at the 5% level in Model 1 while *Underpricing* coefficient is positive and significant at the 10% level in Model 3. The coefficients and signs for other control variables in Model 1 and 3 of Table 3.7 are robust to this alternative specification.

3.4.2.2 The Determinants of Underpricing

The results from our estimation of the *Underpricing* equation reported in Panel A in Table 3.7 reject the notion of first-party certification; the coefficient on *Sponsor reputation* cannot be distinguished from zero. The coefficient on *Premarket demand* is positive and significant, indicating that IPOs offered at the upper end of book-building range are more likely to register positive initial-day returns.[18] Other control variables behave as predicted. For example, the estimated coefficients on *First issue* and *Stock volatility* are positive, which is consistent with a trade-off between risk and returns. *Underwriter reputation* is negatively and statistically significant once we control for *Premarket demand*. This is consistent with the certification role of leading underwriters. The coefficient on *Institutional holdings* is positive and statistically significant at the 5% level, therefore, we do find support for winner's curse hypothesis. The coefficient on *Office* type dummy variable cannot be distinguished from zero.

3.4.2.3 The Determinants of Sponsor Ownership

The sponsor ownership equation results are reported in Panel B in Table 3.7. In line with the commitment hypothesis, the estimated coefficient on *Developer IPOs* is positive and significant, implying that developer sponsors that are subject to potential moral hazard problems align their interest with other REIT shareholders by holding more shares in the REIT. The coefficients on *Growth opportunity* are negative and significant, consistent with Kahn and Winton's (1996) prediction that high growth firms that rely heavily on outside financing tend to sell more IPO shares to finance their growth.

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[18] We also check for the asymmetric component in *Premarket demand* by creating a dummy variable, *Premarket demand (0,1)*, equal to one if the offer price is at the upper end (maximum) of the filling range, and zero otherwise. *Premarket demand (0,1)* itself is positively significant at the 1% level in the underpricing equation (negative, and significant at the 5% level in sponsor ownership equation) and did not change the other coefficients.

Models 3 and 4 also reveal that both *Underpricing* and *Developer IPOs* have an independent impact on *Sponsor ownership*; that is, developers hold a larger share (captured by *Developer IPOs*) to signal their commitment apart from the intention to signal sponsor quality type (captured by *Underpricing*). This result supports the commitment hypothesis.

Although *Stock volatility* is not significantly related to *Sponsor ownership*, we find that *Firm size* is significant and positively related *to Sponsor ownership*, which is contrary to the findings in Demsetz and Lehn's (1985). This finding is, however, consistent with the institutional structure of Asian REITs where large REITs tend to be sponsored by large firms that take concentrated equity position in the REIT post-IPO. In addition, *Institutional holdings* decrease with *Sponsor ownership*. This result is somewhat inconsistent with Hartzell, Kallberg and Liu (2004) who show that firms with stronger governance (in the form of greater managerial ownership) have a larger percentage of institutional ownership. The negative coefficient on *Institutional holdings*, however, supports the idea that REITs with greater *Institutional holdings* tend to face greater pressure and intense monitoring. This, in turn, reduces the potential moral hazard problem post-IPO, hence reducing the level of *Sponsor ownership* required to convince market of their credibility at the IPO stage. Lastly, higher *Premarket demand* has a significant negative impact on *Sponsor ownership*. This is consistent with Loughran and Ritter's (2002) argument that IPOs that experience positive price revision from the midpoint tend to have a lower share retention ratio.

To ensure that our results are robust, we also included in the underpricing regressions (Models 1 and 2 in Table 3.7) proxies that capture IPOs booms since the literature has shown that IPOs issued during hot markets tend to be underprice exesssively (Ritter, 1984). We use two proxies to capture the hot market phenomenon. First, we create a binary variable that takes the value of one for years 2005 and 2006 when the volume of IPOs in Asia is at its peak. Second, we take the logarithm of the volume of all IPOs that came to the market in a year. Neither of these hot-market issues dummies are significantly related to underpricing. Moreover, all other

coefficient estimates remain intact after the incorporation of these dummy variables.[19] We also examine the impact of debt ratio and dividend spread on underpricing and conclude that the level of initial returns is not affected by these variables.

In summary, the evidence presented in Table 3.7 suggests that sponsors' decisions to underprice and to retain shares in the IPO are jointly determined. Prior studies have often ignored this simultaneity issue and thus may have produced biased and inconsistent estimates of the relationship. We further document the role of sponsor business profiles in determining the number of shares they hold at IPO. We find that developer sponsors that are exposed to better growth opportunities tend to take concentrated ownership in the REIT, possibly to compensate investors for the moral hazard problems post-listing.

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[19] Our results are also robust to incorporation of year dummy variables in Models 1 and 2 in Table 3.7.

Table 3.7: 2SLS simultaneous estimation results for *Underpricing* and *Sponsor ownership* equations
The dependent variable for Panel A is *Underpricing* measured as the IPO closing price minus the offering price divided by the offering price. The Dependent variable for Panel B is *Sponsor ownership* equal to the natural log of one plus the aggregate stock ownership of sponsors collected from REIT's first fiscal business reports (6 months from IPO, on average). All non-endogenous variables are pooled and used as instrument in the first stage estimation. . ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level respectively. Definition for other controls variables are in Table 3.4.

	Panel A: Underpricing equation		Panel B: Sponsor ownership equation	
	Model 1	Model 2	Model 3	Model 4
Intercept	-0.123	-2.327***	0.044	0.531***
	(-0.97)	(-4.31)	(0.95)	(3.34)
Underpricing			0.198**	0.133***
			(2.36)	(2.09)
Sponsor ownership	1.656**	2.118***		
	(2.27)	(2.87)		
Sponsor reputation	0.014	0.000		
	(0.87)	(0.01)		
Issue size	-0.046	-0.037		
	(-0.72)	(-0.63)		
Underwriter reputation	-0.630	-1.115**		
	(-1.10)	(-2.03)		
Stock volatility	6.660***	8.289***	-1.183	-1.106
	(2.87)	(3.46)	(-1.33)	(-1.46)
First issue (0,1)	0.055	0.076*		
	(1.46)	(1.97)		
Office (0,1)	-0.049	-0.047		
	(-1.34)	(-1.29)		
Institutional holdings	0.293**	0.252**	-0.148***	-0.110***
	(2.10)	(2.10)	(-5.49)	(-4.65)
Lag market return	-0.027	0.066		
	(-0.09)	(0.23)		
Premarket demand		2.181***		-0.505***
		(4.12)		(-3.39)
Developer IPO (0,1)			0.022**	0.021**
			(2.06)	(2.37)
Firm size			0.033**	0.037***
			(2.04)	(2.75)
Growth opportunity			-0.032*	-0.027**
			(-1.89)	(-2.06)
Country dummies	Yes	Yes	Yes	Yes
R^2	0.24	0.43	0.66	0.72
No of Obs	73	64	73	64

3.4.3   OLS Estimation Results

An important aspect of 2SLS simultaneous estimates is the assumption that *Sponsor ownership* and *Underpricin*g are determined simultaneously. Although 2SLS is valid, it makes sense to compare the estimates produced using OLS. Finding a bidirectional between *Underpricing* and *Sponsor ownership* in OLS would further amplify our conjecture that these two variables are interrelated. In **Table 3.8**, we re-estimate our model using single stage estimates under the assumption that *Sponsor ownership* and *Underpricin*g are exogenous. Effectively, the fitted values of the endogenous variables in Table 3.7 are replaced by actual values in Table 3.8.

Consistent with 2SLS, we find a strong relation between *Underpricing* and *Sponsor ownership*. The coefficients for these variables are positive and significant at the 5% level. Other control variable coefficient estimates are similar those in the 2SLS regressions with few exceptions; *Sponsor reputation*, *Underwriter reputation*, *First issue* and *Office* in underpricing equation become statistically significant if we fail to account for simultaneity in Model 5. On the other hand, *Institutional holdings* in the underpricing equation is insignificant using OLS estimation in Model 5. Similar to 2SLS estimations, the above results are robust to controls such as debt ratio, dividend spread, time and hot market dummies in the underpricing equations. None of these controls are significantly related to underpricing.

Table 3.8: Single equation estimates ignoring endogeneity
The dependent variable for Panel A is *Underpricing* measured as the IPO closing price minus the offering price divided by the offering price. The Dependent variable for Panel B is *Sponsor ownership* measured as the aggregate stock ownership of sponsors collected from REIT's first fiscal business reports (6 months from IPO, on average). Standard errors robust have been corrected for heteroskedasticity. T-statistics are in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level respectively. Definition for other controls variables are in Table 3.4.

	Panel A: Underpricing equation		Panel B: Sponsor ownership equation	
	Model 5	Model 6	Model 7	Model 8
Intercept	-0.127	-1.973***	0.007	0.378
	(-1.51)	(-3.24)	(0.14)	(1.64)
Underpricing			0.088**	0.087**
			(2.54)	(2.14)
Sponsor ownership	0.629**	1.098**		
	(2.27)	(2.61)		
Sponsor reputation	0.022**	0.007		
	(2.02)	(0.63)		
Issue size	-0.012	-0.008		
	(-0.28)	(-0.17)		
Underwriter reputation	-0.671*	-1.117*		
	(-1.73)	(-1.91)		
Stock volatility	6.985*	7.917**	-0.389	-0.518
	(1.91)	(2.25)	(-0.44)	(-0.70)
First issue (0,1)	0.056*	0.077**		
	(1.95)	(2.25)		
Office (0,1)	-0.061**	-0.044		
	(-2.11)	(1.57)		
Institutional holdings	0.139	0.140*	-0.134***	-0.106***
	(1.55)	(1.76)	(-5.08)	(-4.88)
Lag market return	-0.050	0.008		
	(-0.17)	(0.03)		
Premarket demand		1.830***		-0.370
		(2.92)		(-1.65)
Developer IPO (0,1)			0.028**	0.028**
			(2.26)	(2.38)
Firm size			0.040**	0.040**
			(2.11)	(2.20)
Growth opportunity			-0.028**	-0.031**
			(-2.30)	(-2.42)
Country dummies	Yes	Yes	Yes	Yes
R^2	0.24	0.43	0.66	0.68
No of Obs	73	64	78	67

3.5 Robustness Tests

Although our finding of a positive link between *Underpricing* and *Sponsor ownership* is consistent with the signaling model, a positive link is also consistent with the share dilution hypothesis. The share dilution hypothesis conjectures that pre-IPO shareholders who sell fewer shares during the IPO suffer only marginally from underpricing, and hence, are less sensitive to the underpricing. We perform two sets of robustness tests to examine this hypothesis. Our first test is designed to test the assumption that our proxies for quality (*Sponsor reputation, Sponsor ownership, Underpricing*) are positively related to firm value (firm long-term performance). This would allow us to interpret our findings as arising from quality sponsors deliberately underpricing and retaining shares to signal their quality types. In the second robustness test, we create a new variable, *Wealth change*, which measures sponsor wealth change during the interval between when the file price range is set and the close of trading on the day of first issue. We argue that controlling for the benefits of retaining shares, the residual impact of retention on underpricing represents a cost to the issuers that in the context of this paper, constitutes signaling costs.

3.5.1 Further Tests on Signaling Hypothesis

We define successful sponsors as those who maintain their ownership in the REIT and asset management company during the study period. Failed sponsors are defined as sponsors who liquidate or dispose of their interest in the REIT and asset management companies within the first three years of IPO.[20] Prior literature has shown that the presence of shareholders with longer investment horizons leads to greater investment efficiency and can mitigate the incentive for myopic investment decisions (James, 1999; Stein, 1988, 1989). We therefore posit that REITs that have witnessed a change in sponsor after their IPO tend to be associated with poor financial

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[20] Sponsor turnover is a material event due to the intimate relationship between the REIT and its sponsors. Change in sponsors often leads to the change in REIT name and the disposal of IPO sponsor's shares in the advisory company and the REIT to a new sponsor.

performance either at the sponsor or the REIT level. Our data confirm this assertion. **Table 3.9** shows that of the 8 incidences of sponsor turnover (10% of sample IPOs), four sponsors filed for bankruptcy, one sponsor was suspended from trading, one REIT filed for bankruptcy. In addition, two REITs reported a downgrade in their debt rating prior to the sponsor change event.

Table 3.9: Sponsor turnover

	REIT name	Holding period before sponsorship change (Country)	Reasons to sponsor turnover
1	eAsset Investment (now known as la Salle japan)	1.5 year (JREIT)	N.A.
2	Creed Office Investment (now known as Japan Office Investment Corporation)	2.8 years (JREIT)	Sponsor (Creed Corporation) filed for bankruptcy
3	Re-Plus Residential Investment (now known as Japan Rental Investment)	2.3 years (JREIT)	Sponsor (Re-Plus Inc) filed for bankruptcy
4	Nippon Commercial Investment	2.5 years (JREIT)	Sponsor (Pacific Holdings) filed for bankruptcy. Delisted on November 26, 2010, and merged with United Urban Investment Corporation on December 1, 2010.
5	Blife Investment	2.7 years (JREIT)	Main sponsor (Morimoto Co Ltd) filed for bankruptcy.
6	Allco (now known as Fraser Commercial REIT)	2.4 years (SREIT)	Sponsor's (Allco Finance Group) shares were suspended from trading in Australia. Interest in Allco REIT was sold to repay debts.
7	Macquarie Prime REIT (now known as Starhill Global REIT)	3.2 years (SREIT)	Debt ratings were downgraded by Moody's two months prior to the completion of sponsor turnover on account of its weak financials
8	Macarthurcook Industrial REIT (now known as AIMS-AMP Capital Industrial REIT)	2.7 years (SREIT)	Debt ratings were downgraded by Moody's five months prior to the completion of sponsor turnover on account of its weak financials

We appeal to a logistic regression model (reported in **Table 3.10**) where the dependent variable is a dummy variable that is set equal to one if the REIT maintain its sponsor for three years after IPO, and zero otherwise. The sample size is reduced to 68 in Model 9 after eliminating IPOs with less than 3 years of operating history as of May 2010. The key explanatory variables are proxies for quality, i.e. *Underpricing, Sponsor ownership and Sponsor reputation*. As motivated by Gompers and Lerner (1999), we include the natural logarithm of *Issue size*, *BM*

(book-to-market) ratio and *Premarket demand*. Gompers and Lerner (1999) argue that the insignificant of *Issue size and BM ratio* would imply that size and book-to-market portfolio have properly adjusted for risk. Our regression model is as follows:

Sponsor turnover=α + β₁Underpricing + β₂Log(Sponsor reputation) + β₃Log(1+ Sponsor ownership) + β₄Log(Issue size) + β₅Underwriter reputation + β₆BM ratio + β₇JREIT + β₈Premarket demand + ε   *(3)*

Results from Model 9 support the signaling hypothesis. All proxies for quality have the expected positive and significant signs, suggesting that high quality firms (firms that do not change their sponsor) are associated with high quality signals.[21, 22] We interpret these results as evidence that high quality firms are able to signal their quality type via *Underpricing*, *Sponsor ownership* and *Sponsor reputation* during the IPO stage. These results are analogous to the finding of Cai, Duxbury and Keasey (2007) who find that the level of underpricing and the percentage of equity retained by issuers are positively and significantly associated with the likelihood of successful firms (firms that do not delisted from the exchange). The estimated coefficient on *Sponsor ownership,* however, becomes insignificant once we control for *Premarket demand* (Model 10).

To further test the signaling hypothesis, we evaluate whether issuers (sponsors) that underprice more tend to return to the capital market for additional issuance of securities (conducting SEOs within the first 3-years after IPO) or tend to be a repeat player (sponsoring more than one REIT in our study period). Signaling-based models hypothesize that IPO issuers have incentive to "leave a good taste in the investor mouths" because of the possibility of coming

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[21] Our results do not change when we exclude the underpricing variable from the regression models.

[22] We also carried additional tests by examining the sponsors' stock price performance (buy-and-hold abnormal returns) after the first trading day of their sponsored IPOs. We find that more underpriced IPOs are associated with higher abnormal returns (1-, 2- and 3-year windows after the IPO date). This is consistent with the signaling hypothesis that high quality sponsors are more willing to underprice their IPO.

back to the market to sell securities on more favorable terms. The findings (not reported here but

available upon request) reveal that there is no significant relationship between these variables and

underpricing.

Table 3.10: Logit analysis of sponsor commitment in the first three years after IPO
The dependent variable is a dummy variable that equals one for REITs that maintain their sponsor for three years after IPO and zero otherwise. Standard errors robust have been corrected for heteroskedasticity. T-statistics are in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level respectively. Definition for other controls variables are in Table 3.4.

	Dependent variable: Sponsor commitment in the first three years after IPO (0,1)	
	Model 9	Model 10
Intercept	3.707	26.946
	(1.40)	(1.15)
Underpricing	8.779*	11.859*
	(1.65)	(1.66)
Sponsor reputation	0.614**	0.922***
	(2.16)	(2.57)
Sponsor ownership	10.222*	9.068
	(1.89)	(1.33)
Issue size	-1.540	-1.356
	(-1.39)	(-1.02)
Underwriter reputation	-1.664	-11.103
	(-0.13)	(-0.82)
BM ratio	-0.785	-0.579
	(-0.91)	(-0.41)
JREIT (0,1)	1.266	1.799
	(1.20)	(1.42)
Premarket demand		-25.262
		(-1.12)
Pseudo R^2	0.20	0.24
Number of Obs	68	60

3.5.2   *Wealth Gain from Retaining IPO Shares*

Barry (1989) is the first to explicitly show that the cost of underpricing to the issuer declines as share retention rises. Habib and Ljungqvist (2001) and Bradley and Jordan (2002) subsequently provide empirical evidence showing that there is a positive relationship between number of shares retained by the pre-IPO shareholders and underpricing. The intuition is that owners who sell fewer shares during IPO suffer only marginally from underpricing. These studies, however, do not control for the potential benefits of retaining shares that could offset the cost of underpricing. Loughran and Ritter (2002) eventually filled this gap using prospect theory, which predicts that issuers offset the wealth loss from leaving money on the table (underpricing) with larger wealth gains on the retained shares from a price jump (partial adjustment phenomena). The key implication from Loughran and Ritter's (2002) model is the positive covariance of money left on the table and wealth changes.[23]

Consistent with Loughran and Ritter (2002), we construct a variable, *Wealth change*, to capture the sponsors' unexpected wealth gain following a positive price revision in the final offer price. *Wealth change* is measured as the sponsor ownership multiplied by the change in the value per share from the midpoint of filling price range to the closing market price and is expected to be positively related to underpricing. It therefore controls for the sponsors' willingness to underprice in order to generate strong premarket demand that would more than offset their loss from underpricing. We argue that controlling for these unexpected wealth gains from retaining shares, the residual impact from holding shares represents the signaling cost to be borne by the sponsor.

Results from **Table 3.11** shows that the positive interrelationship between *Underpricing* and *Sponsor ownership* is maintained even after controlling for sponsor's potential wealth gain from retaining IPO shares. The significant and positive coefficient on *Wealth change* further

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[23] While Loughran and Ritter (2002) provide descriptive statistics to back their claim that pre-IPO shareholders' wealth change are positively related to underpricing, they do not conduct a multivariate regression on the determinants of underpricing with pre-IPO shareholders' wealth change as one of the independent variable.

sheds light on why sponsors leave money on the table. In line with Loughran and Ritter (2002), our results suggest that sponsors who suffered share dilution from underpricing are simultaneously compensated by the good news in the form of unanticipated wealth increases. Note that we do not include *Premarket demand* in the regression models in Table 3.11 since this variable is highly correlated with *Wealth change* (0.61).[24]

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[24] Our results are robust to the incorporation of *Premarket demand* into the regression models in Table 3.11. The coefficients for *Premarket demand* however turn insignificant once we control for *Wealth change*, suggesting that the positive link between *Premarket demand* and *Underpricing* is mainly driven by Loughran and Ritter's (2002) wealth gain story.

Table 3.11: Further test of dilution hypothesis
Wealth change is measured as the number of shares retained by the sponsors multiplied by the change in the value per share from the midpoint of the filling price range to the closing market price on the first day of trading. This variable is proxies for the change in sponsors' wealth during the interval between when the file price range is set and the close of trading on the first day of issue. T-statistics are in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level respectively. Definition for other controls variables are in Table 4.

	Panel A: 2SLS		Panel B: OLS	
	Underpricing	Sponsor ownership	Underpricing	Sponsor ownership
	Model 11	Model 12	Model 13	Model 14
Intercept	-0.137	0.045	-0.135*	0.022
	(-1.23)	(1.06)	(-1.70)	(0.50)
Underpricing		0.204***		0.130***
		(2.77)		(3.01)
Sponsor ownership	2.185***		1.176***	
	(3.21)		(3.06)	
Sponsor reputation	0.005		0.011	
	(0.34)		(1.16)	
Issue size	-0.034		-0.006	
	(-0.63)		(-0.14)	
Underwriter reputation	-0.428		-0.533	
	(-0.86)		(-1.37)	
Stock volatility	5.122**	-0.932	5.131*	-0.244
	(2.27)	(-1.28)	(1.68)	(-0.34)
First issue (0,1)	0.038		0.045	
	(1.07)		(1.29)	
Office (0,1)	-0.031		-0.030	
	(-0.93)		(-1.27)	
Institutional holdings	0.258**	-0.111***	0.147**	-0.106***
	(2.33)	(-4.75)	(2.24)	(-4.79)
Lag market return	-0.085		-0.122	
	(-0.32)		(-0.54)	
Wealth change	0.003***	-0.001***	0.003***	-0.001***
	(5.46)	(-3.65)	(3.17)	(-2.71)
Developer IPO (0,1)		0.022**		0.027**
		(2.46)		(-2.71)
Firm size		0.022		0.029*
		(1.61)		(1.68)
Growth opportunity		-0.023*		-0.025**
		(-1.82)		(-2.44)
Country dummies	Yes	Yes	Yes	Yes
No of Obs	64	64	64	67
R^2	0.53	0.82	0.49	0.71

3.6   Conclusions

Despite the economic importance and growth opportunities contributed by the sponsor, little is known about the role played by the sponsor in the pricing of IPOs. Our study addresses this gap in the empirical literature by investigating hypotheses relating to how sponsor certification, signaling, and moral hazard considerations affect the level of underpricing and the IPO ownership structure. The IPO literature tends to examine these issues using a single equation approach which assumes that both underpricing and the number of shares retained by the sponsor are exogenously determined. The unique contribution of our study is the modeling of pricing and share retention decisions within a simultaneuos framework.

Our results suggest a positive association between underpricing and sponsor ownership. This is consistent with Grinblatt and Hwang's (1989) signaling model in which firms use both underpricing and share ownership to signal their quality types. Importantly, this bidirectional relationship is robust to controlling for the wealth gain reaped by the sponsor from retaining shares. This allows us to attribute the positive link between sponsor ownership and underpricing as signaling costs borne by the sponsor. Consistent with the commitment hypothesis, we find that developer sponsors tend to hold more IPO shares, possibly to compensate investors for potential moral hazard problems after the IPO.

CHAPTER FOUR

RELATED PARTY TRANSACTIONS, WEALTH EXPROPRIATION AND FIRM VALUATION: EVIDENCE FROM REITS

4.1   Introduction

From an agency cost perspective, related party transactions (RPTs) are often viewed negatively, because they provide direct opportunities for the related parties to expropriate wealth from minority shareholders. For example, a related party may sell its assets and/-or services to a listed REITs at an inflated price. In the corporate finance literature, such activities are commonly referred to as "tunneling". RPTs can also alter the reliability of financial statements, thereby reducing the effectiveness of contracts designed to reduce agency conflicts (Kohlbeck and Mayhew, 2004). Classic anecdotal examples include Enron, which used special purpose entities where its CFO was the general partner to manipulate income, and Adelphia, which provided extensive loans to executives with the intention of deceiving investors and stealing company cash to line their own pockets. Most studies of tunneling focus on the corporate experience in Asia. Academic studies by Cheung, Rau and Stouraitis (2006), Berkman, Cole and Fu (2009), Cheung et al. (2009) and Jiang, Lee and Yue (2010) also conclude that RPTs are harmful to shareholders.

Despite the large number of prior studies of RPTs, none has specifically examined the occurrence of RPTs within the REIT context. It is worthwhile focusing on the REIT markets in Asia for the following reasons. First, the Asian business landscape provides fertile ground for studying issues related to RPTs. In its 2009 report, the OECD stated that abusive RPTs, where a party in control of a company enters into a transaction to the detriment of non-controlling shareholders, are one of the biggest corporate governance challenges facing Asian businesses.

Second, REITs in Asia are not subject to the 5-50 ownership rule that is applicable in the US.[1] As

a result, sponsors tend to retain a higher percentage of newly listed REITs. On average, REIT

sponsors in Asia retained 35.7% of their shares in newly listed REITs, compared to only 17.2% in

the case of US REIT IPOs (see Hartzell, Kallberg, and Liu, 2004). This higher concentration of

ownership, in turn, leads to the managerial entrenchment of the sponsors and the expropriation of

the wealth of minority shareholders. Third, unlike in the US where internal management is the

dominant model, REIT regimes in Asia tend to adopt the external-management model, whereby

the external advisor is a wholly owned subsidiary of the sponsor. This leads to a captive situation

where the interests of minority shareholders are heavily controlled by the sponsors. In particular,

under external management, the sponsor continues to sell its assets and management services to

the listed REIT, creating potential sponsor-shareholder conflict.

A few studies, such as Capozza and Seguin (2000), have found that externally-managed

REITs are more prone to abuse by their external advisors through the excessive use of debt to

finance asset growth. Capozza and Seguin (2000) argue that the compensation contracts of

external managers that are pegged to the size of the asset under management incentivize

managers to enlarge their asset base by issuing more debt, even at terms that are less than optimal.

Hsieh and Sirmans (1991) cite real cases of abusive related party transactions in the US REIT

sector, where the captive REITs pay too much in buying properties from the sponsor and provide

financing to parties related to the sponsors at a cost lower than the market rate. Empirically, they

find that the financial performance of captive REITs is inferior to that of non-captive REITs.

There are, nevertheless, stringent rules to protect minority shareholders. For example,

RPTs must be disclosed through a circular to the shareholders[2] and if the transaction value is

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[1]Under the 5-50 rule, no more than five shareholders are allowed to hold more than a 50% share of a REIT. Note that after the enactment of the "look-through" provision in 1993, institutional holdings are no longer regarded as a single entity (Bianco, Ghosh and Sirmans, 2007).

[2] The threshold to immediately inform a stock exchange of RPTs varies from 0.25% in the case of Malaysia, to 1% and 3% for Hong Kong and Singapore, respectively. REITs may seek a general mandate from the

more than 5% of the firm's net asset value, prior approval from shareholders is required. In the case of the acquisition of properties from related parties, a valuation report and written confirmation from the trustee (supported by a report from an independent financial advisor) that the transaction is on normal commercial terms and not prejudicial to the REIT shareholders are required. Material RPTs may also require prior approval from an independent audit committee. Moreover, monitoring activities by independent directors, institutional investors, debt providers and analysts may discourage wealth expropriation by related parties. The general conclusion of prior studies on the corporate governance of REITs, such as Hartzell, Sun and Titman (2006), Bianco, Chinmoy and Sirmans (2007) and Bauer, Eichholtz and Kok (2010), is that REITs are unique and corporate governance mechanisms are less critical because of the strict rules regulating REITs. Thus, it is unclear whether RPTs are indeed detrimental to the minority shareholders of REITs.

Our empirical investigation is carried out in two stages. First, we examine the frequency and nature of the RPTs undertaken by a sample of REITs listed in three markets in Asia. Second, we analyse the economic consequences of the RPTs for minority shareholders. In contrast to prior studies on tunneling by firms in East Asia, which focused primarily on the expropriation of wealth by the controlling individuals through dubious channels such as inter-corporate loans (Jiang, Lee and Yue, 2010) and loan guarantees (Berkman, Cole and Fu, 2009), RPTs conducted by the REITs in our study sample tend to be transactions between the sponsors, who are also the majority shareholders, and the listed REITs.[3] Specifically, we find that procurements from related parties are by far the most common type of RPT engaged in by REITs. They may be in the form of recurrent management services or the ad-hoc acquisition of assets from the sponsor. The

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shareholders to waive the requirement for immediate announcements as well as approval for material recurring RPTs. Nevertheless, REITs still have to disclose the RPTs in their annual reports.

[3] We do not make any distinction between sponsor and non-sponsor RPTs in our empirical tests in Section 5, as some REITs in our sample do not provide the identity of the related parties in their annual reports. Nevertheless, based on observations with data on the identity of the related parties, we find that, on average, sponsors contributed to 85.6% (median: 97.5%) of the total dollar value of RPTs during the study period.

regression results indicate that RPTs are generally not harmful to REIT shareholders. On the contrary, we find that property acquisitions from related parties are beneficial to firm valuations, except during the financial crisis of 2008-09.

We believe that this is due to the "growth" story which is prized in the stock market, thereby resulting in the REITs with pipelines of assets on standby for future acquisition being favored. Our results are robust after controlling for firms' corporate governance characteristics. In sum, this chapter makes two main contributions to the literature. First, we highlight the incidence and the main channels of the RPTs conducted by REITs. Second, we highlight a special case where RPTs, particularly REITs' acquisition of properties from related parties, are not detrimental to minority shareholders.

This chapter proceeds as follows. Section 4.2 reviews the related literature and outlines our main hypothesis. Section 4.3 describes the research design and data. The basic regression model is presented in Section 4.4, followed by a discussion of the estimation results. Section 4.5 examines how investors price the 'pipeline story' of RPTs into the stock pricing of IPOs. Section 4.6 summarizes the key findings.

4.2   Literature Review and Research Hypotheses

The roots of the research on RPTs can be traced back to the studies of the agency costs that originate from the agency conflicts between controlling shareholders and minority shareholders. These agency conflicts are of particular significance in companies with concentrated ownership because the controlling shareholders have the ability and incentive to expropriate resources out of the firm at the expense of minority shareholders. Baek, Kang and Park (2004) find that firms with concentrated ownership by business groups (chaebols) experienced the largest value losses during the crisis in Korea. Their evidence indicates that the agency costs imposed by concentrated ownership are reflected in the value of the stocks during crisis periods. Other studies show that firms where the controlling shareholders are in a better position to expropriate shareholders trade

at a lower value (Claesens et al., 2002), register a lower operating profits (Joh, 2003), make lower dividend payouts (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 2000), and are subject to higher liquidity costs (Brockman and Chung, 2003).

However, as noted by Cheung, Rau and Stouraitis (2006) these studies at best provide indirect evidence of expropriation, as there is no direct evidence that the value of minority shareholdings has declined as a result of specific acts of expropriation. Focusing on a sample RPTs between listed firms in Hong Kong and their controlling shareholders, the authors show that RPTs that are *a priori* likely to result in expropriation (e.g., asset acquisitions, asset sales, equity sales, and trading relationships) result in considerable shareholder value being destroyed during and after the 12-months following the announcement of these events. Cheung et al. (2009) subsequently reconfirm these negative announcement effects on transactions that involve significant flows of funds between Chinese listed firms and their controlling shareholders such as asset acquisitions, asset sales, asset swaps, trading relationships and cash payments. Xiao (2009) further shows that the abnormal returns of Chinese listed firms following the announcement of RPTs are negatively related to agency costs, as measured by the divergence of control and cash flow rights. In other words, firms prone to agency issues (a high control to cash flow ratio) are more likely to engage in value-destroying RPTs.

This view of RPTs as involving conflicts of interest is echoed by Chien and Hsu (2010), Lin, Liu and Keng (2010), Ryngaert and Thomas (2007), Gordon, Henry and Palia (2004), and Kohlbeck and Mayhew (2004) using a cross-sectional regression approach. Chien and Hsu (2010) find an inverse relationship between RPTs (sales, interest income and interest expenses) and firm profitability as measured by return on assets in a sample of Taiwanese listed firms. Ryngaert and Thomas (2007) and Gordon, Henry and Palia (2004) both examine data from the US and conclude that RPTs are associated with reduced shareholder wealth. Lin, Liu and Keng (2010) and Kohlbeck and Mayhew (2004) find support for the dual effects of RPTs where certain types of RTPs are value-enhancing, while others are value-destroying. For instance, Lin, Liu and Keng

(2010) find that while related party purchases and sales are, on average, beneficial to shareholders, related party sales and purchases with unfavorable credit terms and excessive loan guarantees are harmful as they result in the expropriation of minority shareholders' interests. Moreover, these types of RPTs are negatively related to firm value (as measured by *Tobin's Q* and earning per share). Kohlbeck and Mayhey (2004) find that future stock returns are marginally higher for companies engaging in investment type RPTs while simple RPTs, such as loans guarantees, borrowings, consulting, legal services and leases, are associated with lower future returns.

Cheung et al. (2009) extend the literature on RPTs by showing exactly how expropriation can occur. They observe that firms listed in Hong Kong enter into deals with related parties with unfavorable prices compared to similar arm's length deals. In a similar vein, Berkman, Cole and Fu (2009) show that the issuance of related guarantees by Chinese firms has a negative impact on firm value and financial performance. Jiang, Lee and Yue (2010) document how controlling shareholders abused inter-corporate loans to siphon billons of RMB from hundreds of Chinese listed companies.

While the existing studies tend to support the notion that RPTs are abusive, RPTs may be harmless or beneficial to shareholders when they arise as an efficient contracting arrangement between a firm and its related parties. Ryngaert and Thomas (2007) argue that it makes business sense for a firm to enter into a contract with a related supplier or franchisee due to better coordination and communication between the two parties. This practice also mitigates potential losses due to holdup problems in the contracting process or to the break-up of contractual relationships. For example, Ryngaert and Thomas (2007) contend that *"when a subsidiary of a parent company is spun off to shareholders, it makes sense to have the former parent (and significant shareholder) continue to provide back-office support functions (as long as the former parent is the lowest cost provider)."* Thus, one prediction of the "efficient contracting" hypothesis is that RPT announcements are good news and should be associated with a positive stock price reaction.

In addition to the efficient contracting hypothesis, there is an alternative hypothesis that describes the backing of controlling shareholders in the form of earnings management through the propping up of the firm's earnings. Jian and Wong (2010) find that Chinese companies prop up their earnings via related party sales to their controlling shareholders. These related party sales are used by firms to meet securities regulators' earning targets to maintain their listing status or to qualify for right issues. Similarly, Aharony, Wang and Yuan (2008) document that Chinese listed firms use related party sales to upwardly manage their earnings during the pre-IPO period.

To the best of my knowledge, no study has examined RPTs in a REIT setting. The two papers that are closest to the present study are Ooi, Ong and Neo (2011) and Lecomte and Ooi (2010). Using an event study methodology, Ooi, Ong and Neo (2011) show that the related party acquisitions made by Singapore and Japan REITs during 2002-2007 do not have significant impact on announcement returns. Lecomte and Ooi (2010), on the other hand, use the disclosure quality of RPTs as one of the governance factors to construct a corporate governance index for Singapore REITs. Although they show that the sub-scores for the disclosure quality of RPTs are not significantly related to stock performance, the results are inconclusive as they do not evaluate the materiality of RPTs and its relation with either firm value or firm performance.

It is worthwhile extending the above studies in the following ways. First, by incorporating both recurring and one-off related party transactions to ascertain which type of RPT is more prone to agency issues. Second, by uncovering the time series variation of RPTs and its impact on firm value during different economic conditions, as RPTs may be prone to expropriation during periods of economic distress. Third, by exploring how the market values the future RPTs incurred by a REIT during the IPO stage. Specifically, if the market views RPTs as a potential growth opportunity in the form of a pipeline of properties for future acquisition, we would expect the dollar value of the related party acquisitions conducted by the REIT after the IPO to be positively related to IPO underpricing.

The foregoing literature review leads to the null hypothesis that, *"RPTs are not related to firm value"*. In other words, the null hypothesis is that RPTs do not affect firm value and, hence, we do not expect to see a significant regression coefficient for RPTs. However, if the market believes that the presence of RPTs is associated with decreased shareholder wealth, as predicted by the wealth expropriation hypothesis, then firm value will be negatively associated with RPTs. Conversely, if the stock market thinks that RPTs are beneficial to shareholder wealth, as predicted by the contract efficiency hypothesis, then there will be a positive relationship between firm value and RPTs.

4.3   Data and Research Design

4.3.1   Data

The main source of information on RPTs is the annual reports of the individual REITs, which are extracted from their websites.[4] Related persons include a listed REIT's substantial shareholders, sponsors, directors, chief executive officer, manager and trustee. Under the listing regulations, there is a minimum threshold for the disclosure of RPTs, which varies from S$100,000 in Singapore and RM 250,000 in Malaysia to HK$1 million in Hong Kong.[5] Information disclosures in the annual report are characterized according to the party or parties involved, the type of transaction, and the amounts of transactions. To synchronize the reporting periods of the firms, we classify a financial statement to be of a particular year if its year-end falls between June of that year and May of the subsequent year. The final sample consists of 127 firm-year observations covering 38 REITs from 2003 to 2009.

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[4] RPTs are described under the section entitled *"Related/Interested Party Transactions"* for Singapore REITs, *"Transaction with a Company Related to the Manager"* for Malaysia REITs, and *"Connected Party Transactions and Significant Related Party Transactions and Balances"* for Hong Kong REITs.

[5] In comparison, the threshold value is USD120,000 in the US. Whilst REITs in Asia have a standard and formal policy for review, approval and disclosure of RPTs, the practices in the US are less consistent. Our cursory investigation shows that US REITs may not announce their RPTs immediately to the stock exchange and only report them in the financial reports. In contrast, REITs in Asia are required to make immediate announcement to the stock exchange for material RPTs, which are defined as 1%, 3% and 0.25% of total assets, in Hong Kong, Singapore and Malaysia, respectively.

We note that all the REITs have engaged in some form of RPT. We also find that the average size of RPTs recorded annually by REITs listed in the Asian markets (5.4% of total assets) is much higher than the 2.86% recorded by industrial firms in the US (Ryngaert and Thomas, 2007). The annual size of the RPTs ranges from a minimum of 0.1% to a maximum of 47.0% of the total assets of a REIT. The magnitude of the RPTs also varies from year to year. **Figure 4.1** shows that the three main channels for RPTs by REITs are the acquisition of real estate assets from related parties (57.8%), income earned from related parties (23.1%) and management fees paid to related parties (13.9%).[6] The manager's fees are paid to an external REIT manager, which is usually a wholly owned subsidiary of the sponsor. These fees are pegged to the size of the asset under management (AUM). Moreover, the REIT manager earns acquisitions fee equivalent to 1% of the value of the properties acquired. Property manager's fees are paid as a separate management fees to the property manager for the day-to-day operation of the properties. The property manager is normally wholly owned by the sponsor. Rental income is generated from the leasing of properties to the related parties. It is common for the REIT sponsors to sign a sale and leaseback agreement with the REIT before disposing their properties to the REIT.

Related party acquisitions deserve additional attention because they are the most common form of RPTs engaged in by the REITs. Moreover, the amounts involved are usually much larger than the other types of RPT and the transactions are mostly ad-hoc in nature. The main concern with related party acquisitions is the "fairness" of the price relative to the value of the assets being transferred from the controlling shareholders to the REIT. For example, Cheung et al. (2009) find that controlling shareholders appear to benefit directly at the expense of publicly listed firms in Hong Kong, by selling assets to the firms at above market prices and by acquiring

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[6] Other minor recurring RPTs include share service expenses, accounting services, IT service fees, debt advisory and arrangement fees and various consultancy fees. Other non-recurring RPTs include interest expenses (1.3%), interest income (0.2%), and fees related to the issuance of securities (0.2%) and banker guarantees (0.6%). Interest expenses are paid for loans granted to the REIT by the sponsor, which is not common.

assets from them at below market prices. To what extent this wealth expropriation problem

applies to REITs is debatable, as they operate within a much more transparent and stringent

corporate governance environment. Specifically, REITs acquiring properties from related parties

need to obtain an independent valuation of the fair value of the property. The trustees are also

required to submit written confirmation backed by a report from an independent financial advisor

that the transaction is on normal commercial terms and not prejudicial to the REIT shareholders.

Figure 4.1: RPTs by Asian REITs (% of total assets)
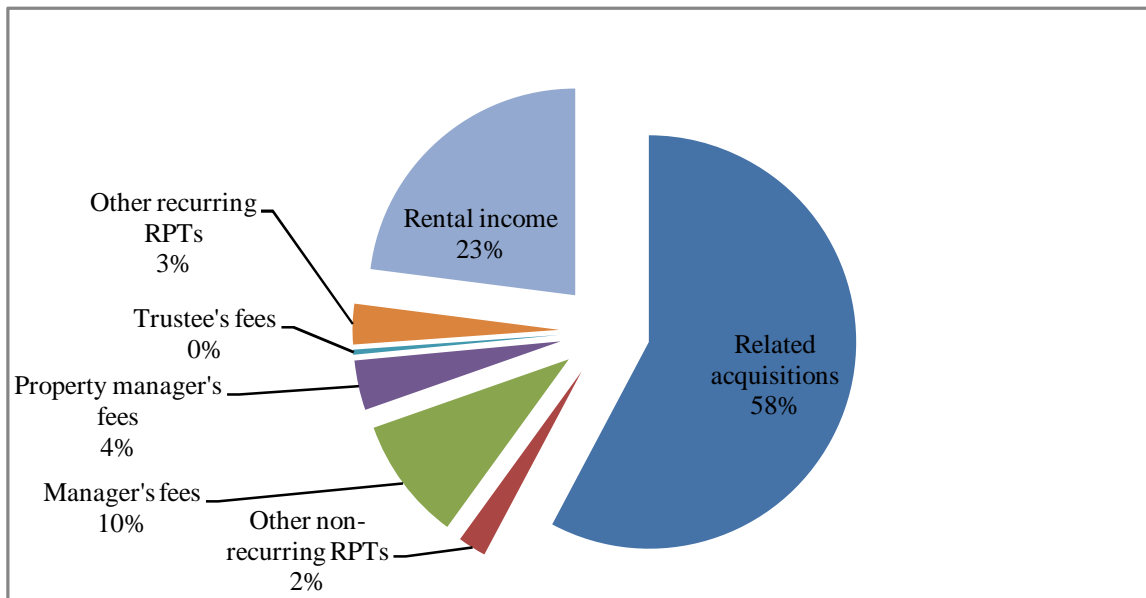
4.3.2   Research Design

Generally, there are two approaches to investigating the impact of RPTs on firm value. The first

approach relies on extracting significant RPTs from the corporate announcement archives for

individual REITs made available at the stock exchanges. An event study methodology is then

employed to measure the wealth effects of the RPT announcements (Cheung et al., 2006, 2009).

The second approach relies on the total dollar value of RPTs disclosed in the annual reports. An

ordinary least square (OLS) analysis is then performed to investigate the relationship between the

dollar amount of RPTs and firm value or performance (Chien and Hsu, 2010; Lin, Liu and Keng, 2010; Ryngaert and Thomas, 2007; Gordon, Henry and Palia, 2004; Kohlbeck and Mayhew, 2004). While the event study approach allows us to capture the impact of material RPT announcements, the OLS approach allows us to investigate the time variation of RPTs while capturing one-off and continuous RPTs. We resort to the second approach. The results obtained using this OLS regression should be seen as complementing the findings discovered using the event study methodology.

To test the relationship between RPTs and firm valuation, we conduct a regression analysis using firms' *Tobin's Q* as the dependent variable in the models. As noted by Ryngaert and Thomas (2007), *Tobin's Q* ratios are frequently used as performance indicators, especially in studies of the effect of firm governance on firm value. Prior studies employing a similar methodology include Gordon, Henry and Palia (2004), Kohlbeck and Mayhew (2004), Ryngaert and Thomas (2007), Chien and Hsu (2010) and Lin, Liu and Keng (2010). For robustness, we also repeat the estimations with *ROA* as the dependent variable. In addition, we follow Bauer, Eichholtz and Kok (2010) in using a time-fixed effects approach and adjust standard errors to account for serial correlation within the firm-cluster. The key variable on the right-hand side is the proxy for RPTs, which is represented by *All RPTs*. If RPTs are harmful, then we would see a negative and significant relationship between RPTs and *Tobin's Q*. We also decompose the total RPTs into the major channels, namely related acquisitions, income RPTs, fee-based RPTs and miscellaneous RPTs.

The control variables included in the right-hand side of the regression model include a set of firm characteristics and another set of dummy variables for property type and country. Firm characteristics include firm size, leverage and age. Finally, a time dummy is incorporated into the model to account for the credit crisis during 2008-09. *Firm size* is measured as the natural log of total assets. Firm valuation is expected to be higher in larger firms, as they are less exposed to expropriation from the controlling shareholders because large firms usually have better disclosure,

more liquid trading and receive more attention from analysts (Claessens et al., 2002). *Firm size*

also serves as a control for economies of scale that boost firm value. *Leverage*, measured as the

ratio of total debt to total assets, is used control to for financial distress and bankruptcy risk. We

expect a negative relationship between *Leverage* and *Tobin's Q*. Similar to Ryngaert and Thomas

(2007), we also control for *Firm age*, measured as the natural logarithm of the number of months

from IPO date. Younger firms are more likely to have greater growth options which lead to

higher valuation, hence, we expect a negative relationship between this variable and firm value.

We also control for *Non-related party acquisitions* measured as the total value of property

acquisitions in a fiscal year minus the related party acquisitions in the corresponding period

scaled by total assets. This is an important control as it allows us to attribute our findings of a

relation between acquisitions and firm value to the roles of a related party. Descriptive statistics

of the sample are presented in **Table 4.1**.

Table 4.1: Descriptive statistics

	Definition	Mean	Std Dev	Min.	Max.
Dependent Variables					
Tobin's Q	Market value of equity minus the book value of equity plus total assets divided by total assets	0.902	0.224	0.490	1.651
ROA	Net income divided by total assets	0.054	0.073	-0.154	0.256
Independent Variables					
RPTs					
All RPTs	Total RPTs scaled by total assets	0.054	0.085	0.001	0.470
Related Acquisitions	Related party acquisitions scaled by total assets	0.031	0.083	0.000	0.450
Income RPTs	Rental and interest income earned from related parties scaled by total assets	0.012	0.022	0.000	0.107
Fee-based RPTs	Manager, property manager and trustee's fees scaled by total assets	0.008	0.004	0.000	0.018
Other RPTs	Project management expenses, other miscellaneous RPTs & guarantees scaled by total assets	0.003	0.007	0.000	0.071
Firm characteristics					
Firm Size	Total assets at the fiscal year ($M)*	1458.88	1605.06	52.64	7589.70
Debt Ratio	Total debts scaled by total assets	0.285	0.108	0.000	0.545
Firm Age	Number of months since IPO*	31.98	16.71	3.0	88.0

* natural logarithm

The mean REIT in our sample has assets of $1.459 billion. The average REIT has a debt ratio of 28.5% and is less than 3 years old. The *Tobin's Q* ratio of the sampled firms ranges from 0.49 to 1.651, with a mean value of 0.902. The average value of the profitability measure (*ROA*) is about 5.4%.

4.4 Estimation Results

4.4.1 Univariate Analysis

Table 4.2 displays the correlation coefficients of the key variables in the regression analysis. For brevity, we do not report the correlation coefficients for other control variables. Nevertheless, the maximum variance inflation factors (VIF) between our key explanatory variables (RPTs variables) and the control variables is 3.00, which is much smaller than the acceptable cut-off point of 10, implying that the problems of multicollinearity are acceptable (Gujarati, 2003). The relationship between *ROA* and *Tobin's Q* is positive and significant, implying that *Tobin's Q* is a good indicator of firm performance (0.28). As expected the correlation between *Credit crisis* and *Tobin's Q* is negative and significant when REIT valuation drops during the credit crisis periods (-0.55). The relation between *All RPTs* and *Tobin's Q* is positive (0.17), but not statistically significant. The breakdown of RPTs by type is revealing. While we do not find significant relationships between *Fees-based RPTs* (0.01), *Income RPTs* (-0.04) and *Other RPTs expenses* (-0.02) with *Tobin's Q*, the relationship is positive and significant at the 5% level for *Related acquisitions*. This provides preliminary support for the claim that related party acquisitions are beneficial to shareholders. Similarly, *Non-RPT acquisitions* also exhibit a positive and significant relationship with *Tobin's Q* (0.23). It is therefore important to control for non-RPT acquisitions in

our regression analysis, as the market may react in the same way to all acquisition announcements,

irrespective of the identity of the property vendors.

Table 4.2: Pearson correlation matrix of regression variables

	1	2	3	4	5	6	7	8	9
1. Tobin's Q	1.00								
2. ROA	0.28*	1.00							
3. Credit Crisis (0,1)	-0.55*	-0.35*	1.00						
4. All RPTs	0.17	0.12	-0.16	1.00					
5. Fees-based RPTs	0.01	-0.16	-0.14	0.08	1.00				
6. Income RPTs	-0.04	0.15	0.12	0.15	-0.33*	1.00			
7 Related acquisitions	0.18*	0.01	-0.17	0.97*	0.13	-0.09	1.00		
8 Non-Related acquisitions	0.23*	0.10	-0.27*	-0.08	0.16	-0.06	-0.06	1.00	
9. Other RPTs	-0.02	0.00	-0.17	0.16	-0.08	-0.01	0.08	-0.12	1.00

* indicating significance at the 5% level.

4.4.2   *The Wealth Effects of RPTs*

The estimation results are presented in **Table 4.3**. Note that all the regression models include

fixed effects for country and property type. Model 1 is the base model to determine the

relationship between RPTs and the dependent variable, namely *Tobin's Q*. In Model 2, we

decompose the single *All RPTs* into four separate components, namely *Fees-Based RPTs, Income*

RPTs, Other RPTs and *Related Acquisitions*. As noted earlier, the first two items are recurring

items, while the last item is non-recurring. The coefficients for the respective components will

help to distinguish whether all or only selected components of RPTs are good. In Model 3, we

test the robustness of the results by incorporating firm-specific attributes. In Model 4, we control

for the effect of the global financial crisis by incorporating an additional binary variable, *Credit*

Crisis, which equals to one for the period 2008-2009.[7] In addition, we interact this new variable

with *Related Acquisitions* and *Non-Related Acquisitions* to examine whether their effects on

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[7] There is a consensus that the global financial crisis began in September 2008 after the collapse of Lehman Brothers, which triggered a credit and liquidity crunch throughout the world. The conditions, however, began to ease at the beginning of 2Q 2009 with the announcements of stimulus packages and the injection of massive liquidity into the market by governments.

corporate value are consistent across different market conditions. The theoretical model of Johnson et al. (2000a) shows that periods of economic distress can result in more expropriation by managers, as the marginal cost for diverting resources away from firms is lower during crisis periods. Empirically, the authors document that during the Asian financial crisis, countries with weak corporate governance tended to experience severe deterioration in their exchange rates and stock market conditions, as investors reassessed and priced the potential agency costs into the stock prices.

Under the null hypothesis that RPTs are not related to firm value, its coefficient would be zero. However, we find that the coefficient for *All RPTs* in Model 1 is positive and statistically significant. Thus, contrary to the null hypothesis, it appears that the firm value of REITs that engage in more RPTs is higher. The regression results of Model 2 clearly show that the benefits of RPTs flow primarily from *Related Acquisitions*. After controlling for firm attributes, the coefficient for *Related Acquisitions* is statistically insignificant in Model 3. Consistent with Ryngaert and Thomas (2007), the coefficient for *Firm Size* is positive and significant at the 10% level. The coefficient for *Firm Age*, on the other hand, is negative and significant at the 5% level. The combined results suggest that while the market values young firms for their potential growth opportunities, large firms are also prized for their size, probably due to scale economies and higher quality of disclosure.

Not surprisingly, in Model 4, the coefficient for *Credit Crisis* is negative and strongly significant. The inclusion of this variable, plus the two interactive variables bumps the R^2 up from 0.30 to 0.55. As can be seen, the valuation effect of *Related Acquisitions* is dependent on the market conditions. Specifically, the coefficient for *Related Acquisitions* remains positive and statistically significant in Model 4, indicating that there is a direct relationship between *Tobin's Q* and *Related Acquisitions* during good economic times. The coefficient for the interaction variable *Credit Crisis*Related Acquisitions* is, however, negative and statistically significant. This indicates that during a credit crisis, real estate acquisitions by REITs from related parties are

viewed negatively by the market. This, however, does not apply to acquisitions conducted on an

arms-length basis during the crisis.

Table 4.3: OLS regression of *Tobin's Q* on related party transactions
The dependent variables are *Tobin's Q*, measured as the market value of equity minus the book value of
equity plus total assets divided by total assets. Related party transactions (RPTs) variables are transactions
reported in the corresponding fiscal year. *All RPTs* are scaled by total assets. The other control variables are
defined as in Table 1. Coefficients for property type and country dummies are not reported. The total
number of observations in each regression is 127. T-statistics are reported in parentheses with the standard
errors adjusted for serial correlation within the firm-cluster. ***, **, and * indicate statistical significance
at the 1%, 5%, and 10% levels, respectively.

	Model 1	**Model 2**	**Model 3**	**Model 4**
Intercept	0.681***	0.678***	0.384	0405*
	(12.69)	(8.65)	(1.10)	(1.89)
All RPTs	0.580*			
	(1.90)			
Fees-Based RPTs		-2.776	4.525	-2.278
		(-0.34)	(0.55)	(0.42)
Income RPTs		-0.585	-1.503	-1.676
		(-0.41)	(-0.99)	(1.13)
Other RPTs		1.671	-0.227	0.293
		(0.72)	(-0.09)	(0.17)
Related Acquisitions		0.644**	0.542	0.845**
		(2.04)	(1.59)	(2.23)
Non-Related Acquisitions		0.464***	0.341**	0.261*
		(3.61)	(2.21)	(1.85)
Firm Size			0.211**	0.133**
			(2.37)	(2.03)
Firm Age			-0.226**	0.045
			(-2.26)	(0.37)
Leverage			-0.209	-0.179
			(-1.03)	(-1.11)
Credit Crisis				-0.202***
				(-4.30)
Credit Crisis*Related Acquisitions				-1.231***
				(-2.97)
Credit Crisis*Non-Related Acquisitions				-0.274
				(-1.22)
R^2	0.18	0.23	0.30	0.55

We also run separate regressions on two subsamples according to the credit crisis period

and non-credit crisis period. The estimation results are reported under Models 5 and 6 in **Table**

4.4. Overall, the results confirm that the wealth effects of *Related Acquisitions* are not consistent

over time. Specifically, its coefficient is negative and statistically significant during the credit

crisis period (Model 5), which is consistent with the wealth expropriation hypothesis. This

finding is consistent with the results of Johnson et al. (2000a) and Lemmon and Lins (2003), who

observe that controlling shareholders are more likely to expropriate from minority shareholders

during an economic crisis. At other times, *Related Acquisitions* are beneficial to REIT

shareholders (Model 6).

Table 4.4: OLS regression of *Tobin's Q* on related party acquisitions controlling for market conditions

The dependent variables are *Tobin's Q*, measured as the market value of equity minus the book value of equity plus total assets divided by total assets. Related party transactions (RPTs) variables are transactions reported in the corresponding fiscal year. *All RPTs* are scaled by total assets. The other control variables are defined as in Table 1. *Credit Crisis* is a binary variable equal to one for the fiscal years of 2008 and 2009. The coefficients for the property type and country dummies are not reported. The total number of observations is 76 for Model 5 (credit crisis sub-sample) and 51 for Model 6 (non-credit crisis sub-sample). T-statistics are reported in parentheses, with the standard errors adjusted for serial correlation within the firm-cluster. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Model 5 (credit crisis)	Model 6 (non-crisis period)
Intercept	0.045	0.418
	(0.31)	(1.31)
Related Acquisitions	-0.478***	0.890**
	(-2.93)	(2.38)
Non-Related Acquisitions	0.128	0.184
	(0.48)	(0.95)
Firm Size	0.088	0.150
	(1.42)	(1.65)
Firm Age	0.242*	-0.123
	(1.89)	(-0.80)
Leverage	-0.069	-0.118
	(-0.59)	(-0.34)
R^2	0.34	0.46

For robustness tests, we control for the number of properties held by REITs in the

Tobin's regression since the positive impact from acquisitions may signal other type of

management structure given the existence of single asset REITs or small portfolio REITs in Asia.

We also control for macro and fundamental effects by including stock market return (measured as

the cumulative returns in the previous 2 quarters) and EBITDA coverage. Finally, we replace

Firm age, a proxy to growth option with total asset growth (y-o-y). Our results remain intact after incorporation of these additional controls.

There are several possible explanations for the positive results. A recent study by Jian and Wong (2010) reveals that Chinese companies prop up their earnings via related party sales with their controlling shareholders. According to the authors, the firms use revenue from related party sales to meet regulators' earning targets to either maintain their listing status or to qualify for rights issues. Earnings management is unlikely to be the explanation for our observed results because, as Figure 4.1 shows, most of the RPTs engaged in by Asian REITs involved cash outflow, rather than cash inflow.[8] Moreover, the coefficient for *Income RPTs* is negative and statistically insignificant in Model 2 and Model 3. Another explanation suggested by Kohlbeck and Mayhew (2004) is that RPTs can be part of a firm's compensation scheme. Firms that engage in RPTs may provide lower cash compensation to reflect the benefits to officers and directors of the RPTs. Although this may be applicable in the case of general firms, it does not explain why, in the case of REITs, only the coefficient for *Related Acquisitions* is significant and not the coefficient for *Fee-based Income.* Another possible reason as to why RPTs are beneficial is that they facilitate "efficient contracting" arrangements in situations involving incomplete information. Ryngaert and Thomas (2007) argue that the close business relationships formed between firms and their related parties are value-enhancing, as they mitigate holdup problems in the contracting process and reduce the likelihood of breaking the contractual relationship.

In an event study on the wealth effects of property acquisitions by Asian REITs, Ooi, Ong and Neo (2011) observe that one-third of the assets acquired by REITs post-IPO are purchased from their sponsors. However, they do not find any significant abnormal returns associated with RPTs, indicating that the properties are sold by the sponsor to the REIT at a fair market value. Despite the lack of results in the short term, we believe that the real reason why

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[8] It should be noted that sponsors rarely provide financial assistance to REITs. In our sample, we only observe two REITs (Fraser Commercial Trust and K-REIT) receiving loans from their sponsors and one REIT (Indiabulls Properties Investment Trust) benefiting from the sponsor guaranteeing its loan.

acquisitions from related parties are beneficial to REIT shareholders in the long-run is due to the "growth" story favored by the market. As the REITs are newly listed, they possess little, if any, track record on growth. However, related acquisitions may offer the REITs a steady pipeline of properties to acquire in the future. Our data indeed shows that the year-on-year growth rate of REITs is faster for those that engage in a higher proportion of related acquisitions.[9] This is not surprising as REITs that engage in a high frequency of related acquisitions tend to be linked to sponsors who are property developers.

4.4.3 Further Test to Pipeline Story

To probe deeper into the value creation related to sponsor pipeline support, we conduct further tests to determine the association between the financial strength of REIT sponsors and the incidence of related party acquisitions conducted by the REITs they are backing. All else being equal, we would expect that the REITs that are backed by sponsors with strong financial and superior growth prospects to register more related party acquisitions. To test this conjecture, we split our sample according to REITs with related party acquisitions versus those without. We define REITs with related party acquisitions as those with at least one related acquisition during 2006-2007. We do not select years prior to 2006 because many REITs are only listed on the stock exchange from 2006 onwards. Our initial sample contains 27 REITs, 12 of which have related party acquisitions, while the remaining 15 are without related party acquisitions. We then tabulate the sponsors' financial ratios using the 2007 financial year data. We delete four observations with missing sponsor financial data. We also exclude three REITs that are sponsored by financial institutions, as the capital structure of financial institutions is significantly different from other

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[9] Specifically, we split the sample into two sub-samples based on their level of RPTs. We then compute the total assets' year-on-year growth rate for both sub-groups. We find that the correlation for the first group (engaged in more RPTs) is significantly higher than that for the second group (engaged in less of RPTs).

industrial firms. Our screens therefore produced a final usable sample of 20 REITs, 10 of which are REITs with related party acquisitions, while the remaining 10 are those without.

Table 4.5 contains the means and corresponding T-test values for our 20 REITs characterized by the existence of related acquisitions during normal economic periods. As shown in Table 4.5, the mean sizes of sponsors (measured by total assets) between the two subsamples are not statistically significant. Although the observed asset growth rate over the preceding 3 years (3-year asset growth) of the individual sponsors in the related party acquisitions subsample is higher, at 57%, than the respective growth rate for the subsample without related party acquisitions (49%), they are significantly indifferent. The dollar value of investment properties held by sponsors (scaled by total assets), another proxy for growth opportunities, is however revealing. The mean investment properties ratio of sponsors in REITs with related party acquisitions (0.42) is significantly higher than the mean investment properties ratio for REITs without related party acquisition (0.08), at the 1 percent level of significance. This suggests that REITs with greater amounts of related party acquisitions in our sample are indeed backed by sponsors with strong pipeline capacity, as these investment properties are transferrable to the REIT at the appropriate time.

The sponsors' mean leverage ratio (total debt/total assets) for the related party acquisitions subsample is 0.25, while the corresponding ratio for the subsample without related acquisitions is little different at 0.30. The sponsors' profitability ratios, as measured by ROA and ROE, in the related party acquisitions subsample are greater than the corresponding ratios for the subsample without related party acquisitions at the 1% level. Similarly, the mean cash holdings ratio of sponsors in the related party acquisitions subsample is significantly higher than the cash holdings ratio for the subsample without related party acquisitions.

In summary, the univariate statistics in Table 4.5 suggest that the growth prospects, profitability and liquidity of the sponsor differ significantly across our two REIT subsamples. REITs with related party acquisitions are backed by sponsors with strong financials and superior

growth prospects. This is consistent with the pipeline story we propose in this paper, which explains why the market attaches a higher value to REITs with higher levels of related party acquisitions. For robustness, we also replicate the univariate tests using data during the financial crisis. **Table 4.6,** however, shows limited univariate evidence to support the hypothesis that the financial characteristics of the sponsors in the related party acquisitions subsample differ significantly from subsample without related party acquisitions. The only notable difference is with respect to profitablity measured by ROA. We find that the REITs that initiated related acquisitions during the crisis period are backed by sponsors with significantly higher ROA than the REITs without related party acquisitions during the same period.

Table 4.5: Sponsor financial characteristics by related party acquisitions during non-crisis periods
The sample is divided according to whether a REIT engages in related party acquisitions during non-crisis periods in 2006-2007. We define REITs with related party acquisitions as those with at least one related party acquisition during 2006-2007. T-statistics are calculated under the assumption of an equal variance. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	REITs with related party acquisitions	REITs without related party acquisitions	T-statistics
Sponsor characteristics			
Firm size (in USD million)	10,857	14,112	0.624
3-year asset growth	0.57	0.49	-0.4876
Investment properties/Total assets	0.419	0.080	5.451***
Leverage	0.25	0.30	0.776
ROA	0.122	0.070	-3.052***
ROE	0.213	0.128	-3.238***
Cash holdings/Total assets	0.155	0.101	-1.625*
No of observations	10	10	

Table 4.6: Sponsor financial characteristics by related party acquisitions during crisis periods
The sample is divided according to whether a REIT engages in related party acquisitions during the crisis periods in 2008-2009. We define REITs with related party acquisitions as those with at least one related party acquisition during 2008-2009. T-statistics are calculated under the assumption of an equal variance. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	REIT with related party acquisitions	REIT without related party acquisitions	T-statistics
Sponsor characteristics			
Firm size (in USD million)	13,817	11,628	-0.421
3-year asset growth	0.315	0.467	1.012
Investment Properties/Total assets	0.259	0.154	-1.181
Leverage	0.229	0.289	0.903
ROA	0.069	0.042	-1.436*
ROE	0.098	0.121	0.3132
Cash holdings/Total assets	0.140	0.135	-0.139
No of observations	8	19	

4.4.4   Corporate Governance Mechanisms

One criticism of the foregoing analysis is that it does not control for the other corporate governance characteristics of the individual REITs. For example, high ownership by the controlling shareholders may increase the ability of insiders to enter into transactions with less oversight (see Kohlbeck and Mayhew, 2004). Thus, in this section, we expand our analysis by incorporating several corporate governance variables in the regression model. For each REIT, we managed to extract information on the board size, number of independent directors and percentages of shares owned by the sponsor, as well as the directors. *Board size* and *Independent directors* have been documented to have negative and positive impacts on *Tobin's Q*, respectively, in the REIT literature, indicating that REITs with a stronger governance structure tend to have higher value.[10] *Sponsors and Directors ownership* are both included in the regression to account for their positive impact on firm value, given the alignment benefit associated with increased

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[10] See Friday and Sirmans (1998) and Han (2006) for the significant positive effects of board independence on firm value, and see Hartzell, Sun and Titman (2006) for the significant negative effects of the board size on firm value.

ownership. Accordingly, the relationship between these ownership variables and *Tobin's Q* is expected to be positive. We also include the square of *Sponsor ownership*, because Han (2006) documents a non-linear relation between *Tobin's Q* and REIT insider ownership. The descriptive statistics of the sampled REITs are presented in **Table 4.7**. The mean number of directors on the board is 7.4, with 45.1% of the directors being independent directors. **Table 4.8** presents the Pearson correlation matrix between all RPTs and the four corporate governance variables. Except for the level of sponsor ownership, none of the corporate governance variables are significantly related to RPTs.[11]

Table 4.7: Corporate governance variables

Variables	Definition	Mean	Std Dev	Min.	Max.
Board Size	Number of directors on the board*	7.4	1.8	2	14
Independent Directors	Independent directors on the board (%)	44.67	11.37	28.57	0.82
Director Ownership	Shares owned by directors (%)	0.005	0.022	0	0.185
Sponsor Ownership	Shares owned by sponsors (%)	0.357	0.207	0	0.764

  * natural logarithm

Table 4.8: Pearson correlation matrix of corporate governance variables

Corporate governance	All RPTs	Board size	Independent directors	Director ownership
Board size	0.03	1.00		
Independent directors	-0.09	-0.11	1.00	
Director ownership	-0.01	-0.00	-0.06	1.00
Sponsor ownership	0.22*	-0.35*	-0.07	-0.20*

[11] In a separate analysis, we divided the REITs in our sample into two groups based on the percentage of shares owned by the sponsors. We observe that REITs with concentrated ownership are more active in related acquisitions. They are also more likely to prop up the REITs' income by providing some form of rental support.

Table 4.9: Controlling for corporate governance variables

The dependent variables are *Tobin's Q* measured as the market value of equity minus the book value of equity plus total assets divided by total assets. Related party transactions (RPTs) variables are transactions reported in the corresponding fiscal year. *All RPTs* are scaled by total assets. *Sponsor (Director) Ownership* is the natural log of one adds the percentage of *Sponsor (Director) Ownership*. Other control variables are defined as in Table 1. Coefficients for property type and country dummies are not reported. Total number of observations in each regression is 127. T-statistics are reported in the parentheses with the standard errors adjusted for serial correlation within the firm-cluster. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%, respectively.

	Model 7	Model 8
Intercept	0.233	0.318
	(1.19)	(1.30)
Fees-Based RPTs		0.278
		(0.04)
Income RPTs		-1.175
		(-0.68)
Other RPTs		1.146
		(0.56)
Related Acquisitions	0.890**	0.903**
	(2.44)	(2.48)
Non-Related Acquisitions	0.216	0.205
	(1.47)	(1.37)
Firm Size	0.137*	0.148**
	(1.99)	(2.07)
Firm Age	0.019	0.016
	(0.15)	(0.12)
Leverage	-0.183	-0.211
	(-1.21)	(-1.18)
Credit Crisis	-0.186***	-0.187***
	(-3.62)	(-3.85)
Credit Crisis*Related Acquisitions	-1.327***	-1.336***
	(-3.13)	(-3.30)
Credit Crisis*Non-Related Acquisitions	-0.313	-0.307
	(-1.30)	(-1.23)
Board Size	0.257*	0.162
	(1.17)	(0.94)
Independent Directors	-0.026	-0.083
	(-0.20)	(-0.59)
Director Ownership	0.031	-0.290
	(0.03)	(-0.23)
Sponsor Ownership	0.418	0.255
	(0.63)	(0.32)
Sponsor Ownership^2	-3.455	-3.032
	(-1.18)	(-0.93)
R^2	0.57	0.57

The regression results are presented in **Table 4.9**. Our earlier results are robust even after

controlling for acquisitions that are done at arms-length, as well as standard firm characteristics

and the corporate governance variables. Except for *Board size* in Model 7, none of the corporate governance variables in the model are statistically significant. The marginal positive effect of a large board is contrary to Hartzell, Sun and Titman's (2006) finding of the negative effects of large boards using the US REIT dataset. The lack of significance of the other corporate governance related coefficients is nevertheless consistent with prior studies. Hartzell, Sun and Titman (2006), Bianco, Chinmoy and Sirmans (2007) and Bauer, Eichholtz and Kok (2010) also find that corporate governance structure does not have any explanatory power on firm value. This is due to the fact that the highly regulated environment in which REITs operate mitigates the need for strong internal corporate governance mechanisms. The general premise is that corporate governance mechanisms, such as the board, ownership and management structures, and institutional investors, are less critical in the case of REITs because of the strict rules regulating REITs. For example, the mandatory 90% payout distribution significantly reduces any potential free cash flow problems. REITs which engage in substantial asset acquisitions are also subject to close monitoring and disciplining by the capital markets because they have to raise funds externally to support the acquisitions.[12]

4.4.5   *Robustness Tests Using ROA as a Proxy for Firm Performance*

As a robustness test, we also examine the impact of RPTs on the operating profitability of REITs using return on assets (ROA). The regression specifications are similar to those used in the *Tobin's Q* regressions in Table 4.9. As shown in **Table 4.10**, the relationship between *Related acquisitions* and firm performance ceases to be significant when we substitute *Tobin's Q* with *ROA*. Interestingly, *Fees –Based RPTs* is significant and negatively related to ROA. Other control variables exhibit interesting patterns. The coefficients for *Non-related acquisitions* are positive and significant, supporting the operating efficiency gains from property acquisitions. The

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[12] We also regresses RPTs against all the corporate governance factors to address the concern of strong correlation between these variables where REITs with weak governance may tend to have higher level of RPTs. None of the corporate governance variables are significantly related to RPTs/related acquisitions.

negative relation between *Leverage* and *ROA* supports the financial distress hypothesis, which predicts an adverse impact of high leverage on firm performance. Our results are consistent with previous studies on the positive effects of board independence on the performance of US REITs (Friday and Sirmans, 1998; and Han, 2006), and reinforce the findings of these studies using Asian REIT data. We also document a non-linear relation between *Tobin's Q* and *Sponsor ownership*. A low level of *Sponsor ownership* is associated with increased *Tobin's Q*, which is in line with the alignment hypothesis. However, as *Sponsor ownership* rises, the *Tobin's Q* ratio declines suggesting that the entrenchment hypothesis becomes dominant.

Overall, the results suggest that RPT activity does not affect the REITs operationally. While this finding is difficult to reconcile with the *Tobin's Q*'s results, the discrepancy is not uncommon in the corporate governance literature. For instance, Gompers, Ishhi and Metrick (2003) compare the impact of governance on various performance related-metrics and document a robust relationship between their G-Index (corporate governance index) and equity prices. However, they do not achieve the same consistent quality of regression when using three operating performances (net-profit-margin, ROE, one-year sales growth).

Table 4.10: Robustness tests using ROA as a proxy for firm performance
The dependent variable is *ROA*, measured as net income divided by total assets. Related party transactions (RPTs) variables are transactions reported in the corresponding fiscal year. *All RPTs* are scaled by total assets. *Sponsor (Director) Ownership* is the natural log of one plus the percentage of *Sponsor (Director) Ownership*. The other control variables are defined as in Table 1. The coefficients for the property type and country dummies are not reported. The total number of observations in each regression is 127. T-statistics are reported in parentheses, with the standard errors adjusted for serial correlation within the firm-cluster. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Model 9	**Model 10**
Intercept	-0.039	-0.007
	(-0.59)	(-0.10)
Fees-Based RPTs		-5.149**
		(-2.69)
Income RPTs		0.288
		(0.71)
Other RPTs		-0.771
		(-1.02)
Related Acquisitions	0.117	0.110
	(0.97)	(0.88)
Non-Related Acquisitions	0.097	0.116*
	(1.46)	(1.82)
Firm Size	0.003	-0.015
	(0.16)	(-0.66)
Firm Age	0.044	0.057
	(1.22)	(1.54)
Leverage	-0.144*	-0.146**
	(-2.39)	(-2.41)
Credit Crisis	-0.058**	-0.063**
	(-2.44)	(-2.61)
Credit Crisis*Related Acquisitions	-0.082	-0.030
	(-0.40)	(-0.14)
Credit Crisis*Non-Related Acquisitions	-0.029	-0.051
	(-0.31)	(-0.60)
Board Size	-0.013	-0.028
	(-0.21)	(-0.40)
Independent Directors	0.124**	0.139**
	(2.16)	(0.91)
Director Ownership	-0.164	0.406
	(-0.43)	(0.91)
Sponsor Ownership	0.282	0.616**
	(1.00)	(2.28)
Sponsor Ownership^2	-1.192	-2.075*
	(-1.07)	(-1.87)
R^2	0.37	0.40

4.5   How do Investors Price the 'Pipeline Story' of RPTs into the Stock Pricing of IPOs?

To understand how market values the 'pipeline story' at the IPO stage, we examine how the IPO underpricing of individual REITs is related to their RPT activity after public listing. Although beneficial, the better growth prospects resulting from the pipeline support through related party acquisitions could increase the severity of moral hazard problems and, hence, make investors demand greater underpricing of the IPO. The hypothesis is that IPOs with higher RPTs activity after listing are underpriced more at the time of the IPO. Consistent with the IPO literature, the dependent variable is underpricing, measured as the IPO closing price minus the offering price scaled by the offering price. RPTs are transactions reported in the annual report for the first financial year after IPO. The approach of using aftermarket variables that are not available at the IPO date to identify specific risk factors is not uncommon in the IPO literature. Miller and Reilly (1987) and Ritter (1984), for example, use trading volume and stock price volatility after IPO, respectively, as proxies to value uncertainty at the IPO stage. Following the third chapter of this thesis (the second essay), we control for *Sponsor ownership*, *Issue size* (proxied by the log of IPO proceeds), *Underwriter reputation*, *Valuation uncertainty* (proxied by the *First issue* of IPO type in a country of origin) and *Institutional holdings.*[13] We also control for country effects by including countries dummies in the regressions.

The results of the multivariate regression models reported in **Table 4.11** confirm the positive relation between RPT activity and IPO underpricing. The breakdown of RPTs by type in Model 12 reveals that the positive effects are driven by related party acquisitions, which is in line with our contention that the market factors the pipeline support from related party acquisitions into IPO pricing. Our results are consistent with the findings of Fan and Wong (2002) that investors mitigate the potential losses from agency issues by acquiring their shares at a discounted price. Thus, it appears that investors view, cautiously, the potential agency costs brought by

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[13] We acknowledge that the model could be extended with more control variables. However, we stay with these controls primarily due to the small sample size of the study.

related party acquisitions and factor this concern into the pricing of IPOs. Our results in the previous section, however, show that the concern over abusive RPTs does not materialize after the IPO.

In Model 13, we include all the control variables that were found to have explanatory power for IPO underpricing. Our results are robust to the inclusion of these controls. The signs of these control variables are in line with expectations, though most of these variables are not statistically significant (except for *First issue*, which is significant at the 5% level). Underpricing is higher for IPOs with high valuation uncertainty (proxied by *First issue*). Similarly, higher *Institutional holdings* are associated with greater underpricing, which is in line with the *winner's curse* prediction. The intuition is that issuers need to underprice more to attract uninformed investors to buy their IPO shares when the fraction of informed investors (institutional holdings) increases. The positive coefficient of *Sponsor ownership* is supportive of the signaling hypothesis, where quality firms (high sponsor ownership) deliberately underprice their IPOs to differentiate themselves from other low quality issuers. The negative sign for *Underwriter reputation* is consistent with the certification roles of reputable underwriters, which reduce the cost of underpricing. Given the small sample sizes, however, these interpretations are offered with caution.

Table 4.11: The relation between RPTs and IPO underpricing
This table presents the coefficient estimates from the regression of underpricing on various control variables. The dependent variable is IPO underpricing, measured as the IPO closing price minus the offering price scaled by the offering price. RPTs are transactions reported in the annual report for the fiscal year after the IPO (at least 1 year from IPO date). *Sponsor ownership* is the natural log of one plus the percentage of sponsor ownership collected from REIT's first fiscal business reports. *Issue size* represents the natural logarithm of offering size (offer price *number of shares offered). *Underwriter reputation* is the ratio of lead underwriters' IPO proceeds to total IPO proceeds raised by all underwriters in the Asia Pacific region during the IPO year. *First issue* is a binary variable that takes one for the first issue of a REIT of its property type in its country of origin. *Institutional holding* is the percentage of shares placed to the institutional investors at IPO. T-statistics are reported in parentheses, with the standard errors adjusted for heteroskedasticity. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Model 11	Model 12	Model 13
Intercept	0.011	0.034	-0.208
	(0.24)	(0.66)	(-1.03)
All RPTs	1.266***		
	(5.74)		
RP Fees		4.951	1.634
		(0.87)	(0.32)
RP Income		-0.132	-1.124
		(-0.18)	(-1.24)
RP property expenses		-1.432	-1.682
		(-1.38)	(-1.15)
Related acquisitions		1.430***	1.476***
		(11.69)	(9.29)
Non-Related acquisitions		0.080	0.073
		(0.57)	(0.43)
Sponsor ownership			0.589
			(1.69)
Issue size			0.064
			(0.76)
Underwriter reputation			-0.518
			(-0.69)
First issue (0,1)			0.106**
			(2.24)
Institutional holdings			0.069
			(0.51)
Country dummies	Yes	Yes	Yes
No of Obs	36	36	36
R^2	0.35	0.49	0.60

4.6   Conclusions

We find that the average size of RPTs recorded annually by REITs listed in the Asian markets is 5.4% of total assets, which is much higher than the 2.86% recorded by industrial firms in the US. In addition, the three main channels for RPTs by REITs are the acquisition of real estate assets from related parties (57.4%), income earned from related parties (22.2%) and management fees paid to related parties (14.8%). The second and third channels are recurrent transactions, while the first channel is on an ad-hoc basis. The regression analysis shows that the RPTs of REITs are not detrimental to their minority shareholders and that the benefits seem to flow primarily from related party acquisitions. This suggests that the market favors the 'pipeline story' offered by related party acquisitions, which ensure that REITs have a sustainable pipeline of properties to acquire in the future. Further tests show that REITs with related party acquisitions are backed by strong sponsors with superior profitability, growth prospects and liquidity as compared to REITs without related party acquisitions. The positive relation between IPO underpricing and related party acquisitions supports the notion that investors are fully aware and cautious of the risk associated with this 'pipeline story' at the IPO stage. For robustness, we also investigate whether the effects of related party acquisitions are stable across time. However, the positive effect of related party acquisitions is qualified during periods of financial crisis.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1   Background

Although studies have examined the costs and benefits of close relationships from various perspectives, empirical evidence on the precise source of the value from a close relationship is still relatively scant. The main argument of this thesis is that close relationships are more valuable to financially constrained firms that rely heavily on external financing. Our research, therefore, focuses on REITs that are financially constrained by the mandated dividend payout requirements. Overall, this thesis has broadened our understanding of the value of relationships. The major contribution of the study has been the identification of the precise source of value from particular forms of close relationship. The three essays in this thesis represent, to the best of my knowledge, the first comprehensive study of the value of relationships in the context of REITs.

5.2   Summary of Main Findings

The first essay establishes the insurance value of banking relationships through access to bank lines of credit. The empirical work provides evidence that REITs are indeed able to draw down from their credit lines during a credit crisis. The insurance value is, however, qualified for smaller and more risky firms. These firms are more likely to be rationed in a credit crisis.

The second essay provides, for the first time, empirical evidence highlighting the value of sponsors' backing of REITs in relation to IPO underpricing. We find that high quality IPOs (IPOs with high sponsor ownership) tend to be more underpriced, which implies the existence of a signaling effect. When a sponsor is committed to retaining a large portion of IPO shares, it implies that they feel the company has not reached its full potential and are confident about the company's future performance. Our results show that this is indeed the case in that IPOs backed

by quality sponsors (high sponsor ownership and strong reputation) tend to have superior long-term performance. The primary contribution of this paper is the modeling of the IPO pricing and share retention decisions within a simultaneous framework. Importantly, the signaling effect is robust to controlling for the wealth gains the sponsors reap from retaining IPO shares

The third essay presents an empirical analysis of the value of the business relationships between IPO sponsors and REITs in relation to related party transactions (RPTs). The three main channels for RPTs by REITs are the acquisition of real estate assets from related parties (57.4%), income earned from related parties (22.2%) and management fees paid to related parties (14.8%). Contrary to the adverse view, that RPTs allow sponsors to expropriate wealth from minority shareholders, our analysis shows that the RPTs of REITs are beneficial to minority shareholders, with the benefits flowing primarily from related party acquisitions. The positive effect of related party acquisitions is, however, qualified during periods of financial crisis.

5.3   Practical Implications

The findings of the first essay imply that bank lines of credit provide only partial or contingent insurance for risky borrowers during credit crises. Although they are generally more dependent on banks lines of credit, small and more risky firms are more vulnerable to rationing during a credit crisis. This shows that the formation of banking relationships during the pre-crisis period does not shield these firms from a credit crisis. As small and more risky firms each make up around 10% of the firm-quarter observations, this implies that nearly 20% of REITs are rationed in a credit crisis. Therefore, we should not assume that this group of REITs as a whole do not matter to the economy. Thus, policy makers must remain alert to the credit rationing faced by small and more risky firms during credit crises. From the lender perspective, the selling of bank lines of credit is risky, because the bank is locked into lending to a borrower who might suffer a decline in creditworthiness that would otherwise dictate a higher interest rate or no loan at all (Avery and Berger, 1991). Our results suggest that offering bank lines of credit does not

necessary lead to an increase in the bank's risk profile during a credit crisis, as the bank is generally able to deny loans to risky firms during crisis periods.

Although the existing literature tends to support the certification effect of sponsor backing in reducing the cost of going public (underpricing), in the second essay we find that the signaling effect is dominant. These contrary research results are likely due to the fact that investors are suspicious of the credibility of first-party sponsor certifications in our sample. This means quality sponsors are willing to retain significant portions of IPO shares to signal their quality to the market. The finding of a positive relation between sponsor share retention and underpricing has significant implications, as investors can rely on these quality signals to fish out quality issues. This explains why, despite the captive management structure that researchers view as the worst-case scenario of agency conflict (Chan, Erickson and Wang, 2002), the REIT sector in Asia does not fall into Akerlof's (1970) lemon market dilemma where only poor quality issues come to the market when investors are unable to differentiate good quality issues from the bad ones. Our results suggest that investors resolve the adverse selection problems at the IPO stage by choosing IPOs that are backed by quality sponsors (high sponsor ownership and high IPO underpricing).

Contrary to previous studies that find related party transactions (RPTs) to be harmful, our results in the third essay suggest that RPTs are beneficial to minority shareholders. We can think of two practical implications of this finding. First, international investors who wish to invest in REIT stocks do not need to be too concerned about the agency costs associated with RPTs. This could be due to sponsors' concentrated ownership structure in the REIT market, which aligns their interests with those of minority shareholders. Second, policy makers concerned about the wealth expropriation associated with RPTs could learn from the strict regulatory environment in which REITs operate. The introduction of REITs has generally improved the standard of corporate governance practices amongst real estate corporations in Asia, with the REITs taking the lead role.

5.4   Limitations and Future Research

No research is without limitations and this study is no exception. This section highlights the limitations of each of the essays, together with our recommendation for further research.

As mentioned in the introduction, we assume the existence of bank lines of credit as the formalization of a banking relationship. However, the strength of the relationship can vary between REITs in a manner that is, in turn, systematically related to their ability to draw down on credit lines during credit crisis periods. Specifically, a stronger relationship with a bank may facilitate a firm's usage of bank lines of credit during credit crisis periods. The unavailability of lender related variables, such as the duration and scope of a relationship in the SNL database, limits our ability to model the strength of banking relationships in our empirical tests.

Another qualification to the first essay is that our empirical models are designed to focus on the demand side (firm) of bank lines of credit, without controlling for supply side (bank) related variables. Data limitation prevented us from extending our investigation to include bank related variables, such as bank size, bank market share, and the financial health of a bank. Bank size could have an impact on the types of loans offered by a bank. Stein (2002) argues that large banks are less efficient at making relationship loans, i.e. loans which depend on soft information. Besides, the deterioration in the financial condition of banks can lead to tight lending standards that reduce the number of loan originations. For future consideration, it would be interesting to expand the current research to cover the characteristics of the lender and the strength of banking relationships.

We have deliberately restricted the scope of the second essay to the backing of IPO sponsors to facilitate a detailed investigation of their role in IPOs. In practice, the parties involved in IPOs, including institutional investors and underwriters, may jointly determine the pricing of IPO shares. Therefore, an interesting extension to the current study would be to explore the interaction effects of IPO sponsors, underwriters and institutional investors at the level of underpricing. For example, it is possible that sponsors with concentrated ownership in REITs

have lesser need to go to reputable underwriters for quality certification. Similarly, it is also plausible for IPOs with high sponsor ownership to attract more institutional interest during the IPO stage.

Although we establish the value-enhancing characteristics of related party acquisitions in the third essay, we do not provide direct evidence of the sources of the value derived from related party acquisitions. Future research could probe deeper into the reasons why related party acquisitions are valued highly by the market. For example, to examine whether related party acquisitions are sold at a discount, or whether the market favors the sponsor pipeline support story, where the existence of related party acquisitions indicates sustainable growth opportunities. Another weakness of this essay is the small sample size. It would be interesting to expand the sample to cover Japanese REITs or to conduct an independent study of the conduct of related party transactions by US REITs. We leave these challenging thoughts for future research.

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APPENDIX

Sample of US Equity REITs in Chapter Two

1	Acadia Realty Trust	31	BNP Residential Properties, Inc.
2	Aegis Realty, Inc.	32	Boston Properties, Inc.
3	Agree Realty Corporation	33	Boykin Lodging Company
4	Alexander's, Inc.	34	Bradley Real Estate, Inc.
5	Alexandria Real Estate Equities, Inc.	35	Brandywine Realty Trust
6	AMB Property Corporation	36	BRE Properties, Inc.
7	Ambassador Apartments, Inc.	37	Burnham Pacific Properties, Inc.
8	America First Apartment Investors, Inc.	38	Cabot Industrial Trust
9	American Campus Communities, Inc.	39	California Jockey Club
10	American Fincial Realty Trust	40	Camden Property Trust
11	American Health Properties, Inc.	41	Capital Automotive REIT
12	American Industrial Properties REIT	42	Capstone Capital Corporation
13	American Land Lease, Inc.	43	Captec Net Lease Realty, Inc.
14	AmeriVest Properties Inc.	44	CarrAmerica Realty Corporation
15	AMLI Residential Properties Trust	45	Catellus Development Corporation
16	AmREIT	46	CBL & Associates Properties, Inc.
17	Apartment Investment and Management Company	47	Cedar Shopping Centers, Inc.
18	Arbor Property Trust	48	Center Trust, Inc.
19	Archstone-Smith Trust	49	CenterPoint Properties Trust
20	Arden Realty Inc.	50	CentraCore Properties Trust
21	Ashford Hospitality Trust, Inc.	51	Charles E. Smith Residential Realty, Inc.
22	ASR Investments Corporation	52	Chateau Communities, Inc.
23	Associated Estates Realty Corporation	53	Chelsea Property Group, Inc.
24	Avalon Properties, Inc.	54	Chicago Dock and Cal Trust
25	AvalonBay Communities, Inc.	55	Cogdell Spencer Inc.
26	Banyan Strategic Land Fund II	56	Colonial Properties Trust
27	Beacon Properties Corporation	57	Columbia Equity Trust, Inc.
28	Bedford Property Investors, Inc.	58	Columbus Realty Trust
29	Berkshire Realty Company, Inc.	59	Commercial Assets Inc.
30	BioMed Realty Trust, Inc.	60	Continental Mortgage and Equity Trust

Sample of US Equity REITs in Chapter Two (continue)

61	Copley Properties, Inc.	91	Federal Realty Investment Trust
62	Cornerstone Properties, Inc.	92	FelCor Lodging Trust Incorporated
63	Cornerstone Realty Income Trust Inc.	93	Feldman Mall Properties, Inc.
64	Corporate Office Properties Trust	94	First Industrial Realty Trust, Inc.
65	Cousins Properties Incorporated	95	First Potomac Realty Trust
66	Crescent Real Estate Equities Company	96	First Washington Realty Trust, Inc.
67	Crocker Realty Trust, Inc.	97	Franchise Fince Corporation of America
68	Crown American Realty Trust	98	Franklin Advantage Real Estate Income Fund
69	CRT Properties, Inc.	99	Franklin Real Estate Income Fund
70	DCT Industrial Trust Inc.	100	Franklin Street Properties Corporation
71	DeBartolo Realty Corporation	101	G&L Realty Corp.
72	Developers Diversified Realty Corporation	102	Gables Residential Trust
73	DiamondRock Hospitality Company	103	General Growth Properties, Inc.
74	Digital Realty Trust, Inc.	104	Getty Realty Corp.
75	Douglas Emmett, Inc.	105	Gladstone Commercial Corporation
76	Duke Realty Corporation	106	Glenborough Realty Trust Incorporated
77	Eagle Hospitality Properties Trust, Inc.	107	Glimcher Realty Trust
78	EastGroup Properties, Inc.	108	Global Sigl Inc.
79	Education Realty Trust, Inc.	109	GMH Communities Trust
80	ElderTrust	110	Golf Trust of America, Inc.
81	Entertainment Properties Trust	111	Government Properties Trust, Inc.
82	Equity Inns, Inc.	112	Great Lakes REIT
83	Equity Lifestyle Properties, Inc.	113	Grove Property Trust
84	Equity Office Properties Trust	114	HCP, Inc.
85	Equity One, Inc.	115	Health Care REIT, Inc.
86	Equity Residential	116	Healthcare Realty Trust, Inc.
87	Essex Property Trust, Inc.	117	Heritage Property Investment Trust, Inc.
88	Evans Withycombe Residential, Inc.	118	Hersha Hospitality Trust
89	Excel Realty Trust, Inc.	119	Highland Hospitality Corporation
90	Extra Space Storage Inc.	120	Highwoods Properties, Inc.

Sample of US Equity REITs in Chapter Two (continue)

121	HMG/Courtland Properties, Inc.	151	Maguire Properties, Inc.
122	Home Properties, Inc.	152	Malan Realty Investors, Inc.
123	Horizon Group, Inc.	153	Maxus Realty Trust, Inc.
124	Hospitality Properties Trust	154	Medical Properties Trust, Inc.
125	Host Hotels & Resorts, Inc.	155	Meridian Industrial Trust, Inc.
126	HRPT Properties Trust	156	Meridian Point Realty Trust IV Co.
127	Inland Real Estate Corporation	157	Meridian Point Realty Trust VI Co.
128	Innkeepers USA Trust	158	Meridian Point Realty Trust VII Co.
129	Insignia Properties Trust	159	Meridian Point Realty Trust VIII Co.
130	Investors Real Estate Trust	160	MeriStar Hospitality Corporation
131	IRT Property Company	161	Merry Land & Investment Company, Inc.
132	Irvine Apartment Communities, Inc.	162	MGI Properties
133	JDN Realty Corporation	163	MHI Hospitality Corporation
134	JP Realty, Inc.	164	Mid-America Apartment Communities, Inc.
135	Keystone Property Trust	165	Mid-America Realty Investments, Inc.
136	Kilroy Realty Corporation	166	Mid-Atlantic Realty Trust
137	Kimco Realty Corporation	167	Mills Corporation
138	Kimsouth Realty, Inc.	168	MIP Properties, Inc.
139	Kite Realty Group Trust	169	Mission West Properties, Inc.
140	Kramont Realty Trust	170	Monmouth Real Estate Investment Corporation
141	Kranzco Realty Trust	171	National Golf Properties, Inc.
142	Landsing Pacific Fund, Inc.	172	National Health Realty, Inc.
143	LaSalle Hotel Properties	173	National Income Realty Trust
144	Lexford Residential Trust	174	National Retail Properties, Inc.
145	Lexington Realty Trust	175	Nationwide Health Properties, Inc.
146	Liberty Property Trust	176	New Plan Excel Realty Trust, Inc.
147	Longview Fibre Company	177	Newkirk Realty Trust, Inc.
148	LTC Properties, Inc.	178	North American Trust, Inc.
149	Macerich Company	179	Oasis Residential, Inc.
150	Mack-Cali Realty Corporation	180	One Liberty Properties, Inc.

Sample of US Equity REITs in Chapter Two (continue)

181	Pacific Gulf Properties, Inc.	211	Ramco-Gershenson Properties Trust
182	Pacific Office Properties Trust, Inc.	212	Real Estate Investment Trust of California
183	Pan Pacific Retail Properties, Inc.	213	Realty Income Corporation
184	Paragon Group, Inc.	214	Reckson Associates Realty Corporation
185	Parkway Properties, Inc.	215	Regency Centers Corporation
186	Partners Preferred Yield II, Inc.	216	Republic Property Trust
187	Partners Preferred Yield III, Inc.	217	RFS Hotel Investors, Inc.
188	Partners Preferred Yield, Inc.	218	Roberts Realty Investors, Inc.
189	Pennsylvania Real Estate Investment Trust	219	ROC Communities, Inc.
190	Plum Creek Timber Company, Inc.	220	Rouse Company
191	Post Properties, Inc.	221	Santa Anita Realty Enterprises, Inc.
192	Potlatch Corporation	222	Saul Centers, Inc.
193	Prentiss Properties Trust	223	Security Capital Atlantic Incorporated
194	Price Legacy Corporation	224	Senior Housing Properties Trust
195	Price REIT, Inc.	225	Shelbourne Properties I, Inc.
196	Prime Group Realty Trust	226	Shelbourne Properties II, Inc.
197	Prison Realty Trust Inc.	227	Shelbourne Properties III, Inc.
198	ProLogis	228	Shurgard Storage Centers, Inc.
199	PS Business Parks, Inc.	229	Simon Property Group Inc.
200	Public Storage	230	Sizeler Property Investors, Inc.
201	Public Storage Properties IX, Inc.	231	SL Green Realty Corp.
202	Public Storage Properties X, Inc.	232	South West Property Trust, Inc.
203	Public Storage Properties XII, Inc.	233	Sovran Self Storage, Inc.
204	Public Storage Properties XIV, Inc.	234	Spieker Properties, Inc.
205	Public Storage Properties XIX, Inc.	235	Spirit Fince Corporation
206	Public Storage Properties XV, Inc.	236	Storage Properties, Inc.
207	Public Storage Properties XVI, Inc.	237	Storage Trust Realty
208	Public Storage Properties XVII, Inc.	238	Storage USA, Inc.
209	Public Storage Properties XVIII, Inc.	239	Strategic Hotels & Resorts, Inc.
210	Public Storage Properties XX, Inc.	240	Summit Properties Inc.

Sample of US Equity REITs in Chapter Two (continue)

241	Sun Communities, Inc.
242	Sunstone Hotel Investors, Inc.
243	Supertel Hospitality, Inc.
244	Tanger Factory Outlet Centers, Inc.
245	Taubman Centers, Inc.
246	Tower Realty Trust, Inc.
247	Town and Country Trust
248	TriNet Corporate Realty Trust, Inc.
249	Trizec Properties, Inc.
250	Tucker Properties Corporation
251	U.S. Restaurant Properties, Inc.
252	UDR, Inc.
253	UMH Properties, Inc.
254	United Investors Realty Trust
255	Universal Health Realty Income Trust
256	Urban Shopping Centers, Inc.
257	Urstadt Biddle Properties Inc.
258	USP Real Estate Investment Trust
259	U-Store-It Trust
260	Value Property Trust
261	Vanguard Real Estate Fund I
262	Ventas, Inc.
263	Vordo Realty Trust
264	Walden Residential Properties, Inc.
265	Washington Real Estate Investment Trust
266	Weeks Corporation
267	Weingarten Realty Investors
268	Wellsford Residential Property Trust
269	Western Properties Trust
270	Westfield America, Inc.
271	Windrose Medical Properties Trust
272	Winston Hotels, Inc.
273	Winthrop Realty Trust

Sample of Asian Equity REITs in Chapter Three

	REIT	**Main Sponsor**
1	The Link REIT	Hong Kong Housing Authority
2	Prosperity REIT	Cheung Kong
3	GZI REIT	GZI Group
4	Champion REIT	Great Eagle
5	Sunlight REIT	Henderson Land Development
6	Regal REIT	Regal Hotels International
7	RREEF CCT REIT	Deutsche Bank
8	Nippon Building Fund	Mitsui Fudosan
9	Japan Real Estate Investment	Mitsubishi Estate Corporation
10	Japan Retail Fund Investment	Mitsubishi Corporation
11	ORIX JREIT	Orix Corporation
12	Japan Prime Realty Investment	Tokyo Tatemono Co
13	Premier Investment company	Ken Corporation
14	TOKYU REIT	Tokyu Group
15	Global One	Mitsubishi Tokyo Financial Group Inc & 3 others
16	Nomura Real Estate Office	Nomura Real Estate Development Company
17	United Urban	Trinity Investment
18	Mori Trust Sogo	Mori Trust Co Ltd
19	Nippon Residential Investment	Pacific Management Corporation
20	TGR Investment	Tokyo REIT Co Ltd
21	Frontier Real Estate Investment	Japan Tobacco Inc
22	Crescendo Investment	Kanaru KK
23	Japan Logistics Fund	Mitsui & Co Ltd
24	Fukuoka REIT	Fukuoka Jisho
25	Prospect Residential Investment	KK Prospect
26	Japan Single-Residential Investment	Darwin Inc, Creed Corp, Lehman Brothers
27	Kenedix Realty Investment	Kenedix Group
28	Joint REIT Investment	Joint Corporation
29	La Salle Japan REIT	eBank Corporation
30	FC Residential Investment	Fund Creation
31	DA Office Investment	KK DaVinci Advisor
32	Hankyu REIT	Hankyu Corporation Group
33	Advance Residence Investment	Itochu Corp
34	Starts Proceed Investment	Starts Corporation
35	LCP Investment	LCP group L.P.
36	Japan Hotel & Resort	Goldman Sachs Group
37	Top REIT	The Sumatomo Trust & Banking

Sample of Asian Equity REITs in Chapter Three (continue)

38	Japan Office Investment Corporation	Creed Group
39	Blife Investment	Morimoto Co Ltd
40	Nippon Hotel Fund Investment	Creative Renovation Group Japan Inc
41	Japan Rental Housing Investment	Re-Plus Inc
42	Japan Excellent Inc	Kowa Real Estate
43	Nippon Accommodation Fund	Mitsui Fudosan Co
44	Mid REIT	MID Urban Development Co Ltd
45	Nippon Commercial Investment	Pacific Management Corp
46	Mori Hills REIT Investment	Mori Building
47	Nomura Real Estate Residential Fund	Nomura Real Estate Development Company
48	Industrial & Infrastructure Fund	Mitsubishi Corp
49	New City Residence	CB Richard Ellis Investors
50	Capitamall Trust	Capitaland
51	Ascendas REIT	JTC Corporation (parent for Ascendas Land)
52	Fortune REIT	Cheung Kong
53	Suntec REIT	Cheung Kong
54	Mapletree Logistics Trust	Mapletree Investments
55	Starhill Global REIT	Macquarie Bank Group
56	Frasers Commercial REIT	Allco Financial Group
57	Frasers Centrepoint Trust	Fraser & Neave Group
58	CDL Hospitality Trust	Millennium & Copthorne Hotel
59	Cambridge Industrial Trust	CREIM
60	Capitaretail China Trust	Capitaland
61	First Real Estate Investment Trust	PT Lippo Karawaci Tbk
62	Macarthurcook Industrial REIT	Macarthurcook
63	Ascendas India Trust	JTC Corporation (parent for Ascendas Land)
64	Parkway Life REIT	Parkway Holdings
65	Saizen REIT	Japan Regional Assets Manager
66	Lippo-Mapletree Indonesia Retail Trust	PT Lippo Karawaci Tbk
67	Indiabulls Properties investment Trust	Indiabulls Real Estate
68	Axis REIT	Axis Development
69	Starhill REIT	YTL Group
70	UOA REIT	UOA Holdings
71	Tower REIT	GuocoLand
72	Al-Aqar KPJ REIT	KPJ Group
73	Hektar REIT	Hektar Group
74	Amfirst REIT	AmBank Group (parent for Aminvest Group)

Sample of Asian Equity REITs in Chapter Three (continue)

75	Quill Capita Trust	Quill Group/Capitaland
76	Al-Hadharah Boustead REIT	Boustead group
77	Amanahraya REIT	Amanahraya Bhd
78	Atrium REIT	Glory Blizt Industries

Asian REITs Included in the Study Sample in Chapter Four

No	REIT
1	Capitamall Trust
2	Ascendas REIT
3	Fortune REIT
4	CapitaCommercial Trust
5	Suntec REIT
6	Mapletree Logistics Trust
7	Starhill Global REIT
8	Fraser Commercial REIT
9	Ascott Residence Trust
10	K-REIT Asia
11	Fraser Centrepoint Trust
12	CDL Hospitality Trust
13	Cambridge Industrial Trust
14	CapitaRetail China Trust
15	First REIT
16	AIMS AMP Capital Industrial REIT
17	Ascendas India Trust
18	Parkway Life REIT
19	Saizen REIT
20	Lippo-Mapletree Indonesia Retail Trust
21	Axis-REIT
22	Starhill REIT
23	UOA REIT
24	Tower REIT
25	Al-Aqar KPJ REIT
26	Hektar REIT
27	Amfirst REIT
28	Quill Capita Trust
29	Al-Hadharah Boustead REIT
30	Amanaraya REIT
31	Atrium REIT
32	The Link REIT
33	Prosperity REIT
34	GZI REIT
35	Champion REIT
36	Sunlight REIT
37	Regal REIT
38	RREEF CCT REIT