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A Global Tour of Commercial Property and REIT Markets

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Securitized equity interests in commercial property (the so-called listed REIT market) across a number of countries are analyzed. In so doing, we have pulled together financial as well as real economic data from a large number of different sources. On the real side, we focus particularly on office property construction, as data are fairly available in that sector. The comparison of REIT markets across countries reveals significant variation in terms of institutional characteristics, but many similarities in terms of financial performance. Office construction activity also displays some synchronicity across countries, with a general pattern of reduced levels and volatility in construction activity over the past two decades. Linkages between REIT market development and the dynamics of new construction activity are explored.

Keywords

Securitization, REITs, Commercial real estate, Office property, Cross-Country comparison

1. Introduction

We study securitized equity interests in commercial property, broadly known as the listed real estate investment trust (or REIT) market, across countries located in the Asia-Pacific, Europe and North America. Publicly traded equity REITs are tax exempt firms that hold interests on a pool of commercial real estate assets. Offsetting the benefits of tax exemption are certain rules that govern the financial and operating policies of the firm, including a requirement to pay out a high percentage of income as dividends.

The paper is partly intended as a descriptive overview of the international REIT markets, including their relation to the underlying broader-based commercial property markets. We differ from other REIT overview papers such as Ooi et al. (2006) and Chan et al. (2012) not only in terms of the depth and timeliness of the data coverage, but also in that we broaden the scope of the review to include real outcomes in commercial property markets. Indeed, in undertaking our analysis, we bring together a wide range of financial as well as real economic data from a variety of sources. These data allow us to undertake a comprehensive review of the market development and characteristics of REIT markets, as well as commercial property construction cycles (with a focus on office construction).

We document structural differences in how REITs operate across countries. In the United States, the REIT sector has shown exceptional long-term performance, likely due to formal and transparent governance mechanisms, relatively lower leverage, and a concentration of management talent in the sector. In contrast to the United States and Europe, the general tendency in Asia is to manage assets through an external advisor structure; on the other hand, the United States and Asia share a high level of institutional holdings relative to European REITs. Market performance metrics are strikingly similar across markets, in that REITs in most countries in recent years show greater volatility and correlation with the broader market indices than before the global financial crisis. However, while the diversification benefits of REITs seem to have diminished, they remain greater in most markets than those of publicly listed non-REIT property market companies.

The paper also explores the link between the development of REIT markets and property market cycles; in particular, whether differential REIT market development has resulted in different construction-real investment outcomes. A major finding is that office construction activity shows a general pattern of reduced levels and volatility over the past twenty years. One hypothesis with testable implications is that this outcome is due to the development of REIT markets. While in the United States the pattern of reduced variation in construction does appear to be related to the development of the REIT sector, in a sample of three countries for which a long-enough time series exist to test the hypothesis – Australia, France and Japan – we find similar evidence only

in Japan for the importance of REIT market development on ameliorating boom-bust cycles in commercial property construction.

The rest of the paper proceeds as follows. In the next section, we document the REIT and commercial property data sources for the paper, which extend to 14 countries. Then we provide institutional and market details relevant to the understanding of REIT markets and their differences. The following section reviews office supply dynamics and the results of empirical tests of the impact of REIT markets on office supply in three countries. The final section concludes.

2. Data

An important contribution of this research program is the extent to which we draw from disparate data sources to analyze financial and real economic characteristics of commercial property and REIT markets around the world. We cover 14 countries, where sample time periods differ depending on the country covered and the data category. The United States is the case that gets the most in-depth treatment, with some data going back to the 1980s. Australia, Japan and France also receive some special attention. In North America, we also cover Canada; in Asia, we analyze Hong Kong, Korea, Singapore, Malaysia and Thailand; and in Europe, we examine Belgium, Germany, the Netherlands, and Great Britain. Table 1 presents the data definitions, time periods and sources by category and country. What follows now is a brief description of the data.

1. REIT indices price and return. For the sake of assessing the time series of REIT returns in the various jurisdictions, the total return index price and return are collected for the various countries from different sources. For Australia (S&P/ASX 200 A-REIT index), Japan (Tokyo Stock Exchange REIT index), and Singapore (FTSE Straits Times RE Invest Trust index), the REIT indices are sourced from Bloomberg. For the United States (FTSE NAREIT US Real Estate Index, All Equity REITs Index), the source is the National Association of Real Estate Investment Trusts. For Belgium, Canada, France, Germany, Hong Kong SAR, Korea, Malaysia, the Netherlands, Thailand, and the United Kingdom, the source is the DataStream REIT index.

2. Listed developer equity index series. The share prices of listed property development firms are used both as a proxy for real estate valuation and performances, and to assess the qualities of REITs as an investment class. For the United States, we examine an index of homebuilder share price performance, as well as a property market developer index. We also distinguish between the equity indices of the various sectors of commercial property: office, retail, and hotel properties. For the remainder of the sample countries, we look at general property market development indices.

Table 1 Data Definitions, Time Periods and Sources

I) Construction supply data				
a) Total stock: Represents the total completed space (occupied and vacant) in the private and public sectors at the survey date, recorded as the net rentable area. Total Stock should include all types of buildings regardless of quality, age and ownership (i.e. both leased and owner-occupied). Includes purpose-build, space converted from other uses and independent space that form part of a mixed-use development.				
	Unit	Data availability		Source
		Annual	Quarterly	
Australia (Sydney)	Thousands square feet	1990–2011	H1 1990–H2 2011	CB Richard Ellis
Belgium (Brussels)		1990–2011	Q4 2000–Q4 2011	CB Richard Ellis
Canada (Toronto)		1990–2010	Q1 1990–Q3 2011	CB Richard Ellis
France (Paris)		1990–2011	Q4 1997–Q4 2011	CB Richard Ellis
Germany (Frankfurt)		1998–2011	Q4 1998–Q4 2011	CB Richard Ellis
Hong Kong SAR		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
Japan (Tokyo 23 wards)		1996–2011	Q4 1996–Q4 2011	CB Richard Ellis
Korea (Seoul)		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
Netherlands(Amsterdam)		2009–2011	Q4 2007–Q4 2011	CB Richard Ellis
Singapore		1988–2011	Q1 1988–Q4 2011	Urban Redevelopment Authority
Thailand (Bangkok)		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
United Kingdom (London)		1990–2011	Q4 1994–Q4 2011	CB Richard Ellis
United States		1990–2011	Q1 1990–Q4 2011	CB Richard Ellis
b) Development completions: Represent the total net rentable area of completed new and significantly refurbished (stripped back to shell and core) floor space that has reached practical completion and is occupied, ready for occupation or an occupancy permit, where required, has been issued during the survey period. The status of the building will have been changed from space Under Construction to Development Completion during the quarter.				
	Unit	Data availability		Source
		Annual	Quarterly	
Australia (Sydney)	Thousands square feet	1990–2011	H1 1990–H2 2011	CB Richard Ellis
Belgium (Brussels)		1990–2011	Q2 2001–Q4 2011	CB Richard Ellis
Canada (Toronto)		1990–2010	Q1 1990–Q3 2011	CB Richard Ellis
France (Paris)		1990–2011	Q4 2008–Q4 2011	CB Richard Ellis
Germany (Frankfurt)		2003–2011	Q1 2003–Q4 2011	CB Richard Ellis
Hong Kong SAR		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
Japan (Tokyo 23 wards)		1996–2011	Q4 1996–Q4 2011	CB Richard Ellis
Korea (Seoul)		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
Netherlands(Amsterdam)		2009–2011	Q1 2009–Q4 2011	CB Richard Ellis
Singapore ¹		1991–2010	Q1 1988–Q4 2011	Urban Redevelopment Authority
Thailand (Bangkok)		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
United Kingdom (London)		1990–2011	Q1 1990–Q4 2011	CB Richard Ellis
United States		1990–2011	Q1 1990–Q4 2011	CB Richard Ellis

¹ Private and public sector office space under construction.*(Continued...)*

(Table 1 Continued)

c) <u>Vacancy rate</u> : Vacant space, which represents the total net rentable floor space in existing properties, which is physically vacant and being actively marketed at the survey date, expressed as a percentage of total stock.				
	Unit	Data availability		Source
		Annual	Quarterly	
Australia (Sydney)	In percent	1990–2011	H1 1990–H2 2011	CB Richard Ellis
Belgium (Brussels) ²		1990–2011	Q2 2001–Q4 2011	CB Richard Ellis
Canada (Toronto)		1990–2010	Q1 1990–Q3 2011	CB Richard Ellis
France (Paris)		1990–2011	Q4 2008–Q4 2011	CB Richard Ellis
Germany (Frankfurt)		1990–2011	Q1 2003–Q4 2011	CB Richard Ellis
Hong Kong SAR		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
Japan (Tokyo 23 wards)		1996–2011	Q4 1996–Q4 2011	CB Richard Ellis
Korea (Seoul)		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
Netherlands(Amsterdam)		1990–2011	Q1 2009–Q4 2011	CB Richard Ellis
Singapore		1988–2011	Q1 1988–Q4 2011	Urban Redevelopment Authority
Thailand (Bangkok)		2005–2011	Q1 2005–Q4 2011	CB Richard Ellis
United Kingdom (London)		1990–2011	Q4 1994–Q4 2011	CB Richard Ellis
United States		1990–2011	Q1 1990–Q4 2011	CB Richard Ellis
II) Property indices				
a) <u>REITs, all property types</u>				
	Definition	Annual	Time period	Source
Australia	S&P/ASX200 A-REIT index	31.3.2000 =1231.333	Jan2002– Dec 2011	Bloomberg
Belgium	Datastream REIT index	16.12.1994=100	Jan2002– Dec2011	Datastream
Canada	Datastream REIT index	5.1.1994=100	Jan2002– Dec2011	Datastream
France	Datastream REIT index	8.7.1988=100	Jan2002– Dec2011	Datastream
Germany	Datastream REIT index	19.12.1988=100	Jan2002– Dec2011	Datastream
Hong Kong SAR	Datastream REIT index	25.11.2005=100	Nov2005– Dec2011	Datastream
Japan	Tokyo Stock Exchange REIT index	31.3.2003=1000	Mar2003– Dec2011	Bloomberg
Korea	Calculated ^{3, 4}	21.5.2001=100	Jan2002– Dec2011	Bloomberg, calculations by authors
Netherlands	Datastream REIT index	1.1.1973=100	Jan2002– Dec2011	Datastream
Singapore	FTSE Straits Times RE Invest Trust index	2.9.2002=333.86	Sep2002– Dec2011	Bloomberg

(Continued...)

(Table 1 Continued)

b) <u>REITs, all property types</u>				
	Definition	Annual	Time period	Source
Thailand	Calculated ^{3,5}	19.11.2003=100	Nov2003– Dec2011	Bloomberg, calculations by authors
United Kingdom	Datastream REIT index	5.1.1965=100	Jan2002– Dec2011	Datastream
United States	FTSE NAREIT US Real Estate Index, equity REIT index	2.1.1973=100	Jan2002– Dec2011	NAREIT
<p>² This is the “availability rate”, which represents the total net rentable floor space in existing properties, which is being actively marketed, either for lease, sublease, and assignment or for sale for owner occupation as at the end of the survey period, rather than vacancy from 2008. ³ Summing of the market capitalizations divided by the sum of the number of shares of the sample. ⁴ Korea Real Estate Investment Trust Co, KOCREF REIT VIII, KR2 Development REIT Co Ltd and Golden Narae Real Estate Development Trusts Co Ltd. ⁵ TICON Property Fund, Millionaire Property Fund, MFC Nichada Thani Property Fund and Bangkok Commercial Property Fund.</p>				
c) <u>REITs, office indices</u>				
	Definition	Annual	Quarterly	Source
Australia	Datastream office REIT index	6.12.1991=100	Jan 2002–Dec 2011	Datastream
Belgium		16.12.1994=100	Jan 2002–Dec 2011	
Canada		26.12.1997=100	Jan 2002–Dec 2011	
France		4.1.1988=100	Jan 2002–Dec 2011	
Germany		2.4.2007=100	Apr 2007–Dec 2011	
Hong Kong SAR		24.5.2006=100	May 2006–Dec 2011	
Japan		10.9.2001=100	Jan 2002–Dec 2011	
Netherlands		31.8.1989=100	Jan 2002–Dec 2011	
Singapore		19.11.2002=100	Nov 2002–Dec 2011	
United Kingdom		5.1.1965=100	Jan 2002–Dec 2011	
United States		18.8.1998=100	Q1 1990–Dec 2011	
III) Construction cost				
	Definition	Unit	Time period	Source
Australia	Producer price index of non-residential building construction	Sep98– Jun99=100	Q3 1996 –Q4 2011	Australian Bureau of Statistics
France	Construction cost index, residential buildings, except residences for communities	2005=100	Q1 1993 –Q4 2011	Eurostat
Japan	Japan building construction started, estimated costs – office	Per square meter	Q4 1991 –Q4 2011	Ministry of Land, Infrastructure, Transport and Tourism, Japan
United States	Class A fireproof steel frame building, average of Eastern, Central and Western	1926=100	Q4 1991 –Q4 2011	Marshall and Swift construction cost

3. Other market series. National equity price indices are used to assess REIT diversification characteristics as well as the general sensitivity of REITs to market conditions.

4. Office supply and supply/vacancy rates for major cities. Office supply data are obtained from CB Richard Ellis (CBRE) for major markets across the United States as well as for 11 major cities located outside the United States: Brussels, Belgium; Toronto, Canada; Paris, France; Frankfurt, Germany; Amsterdam, the Netherlands; London, the United Kingdom; Tokyo, Japan; Hong Kong SAR; Sydney, Australia; Bangkok, Thailand; and Seoul, South Korea. Similar data for Singapore are obtained from the Urban Redevelopment Authority. For each of the cities (countries) under investigation, the total stock of office real estate outstanding (area), as well as completions and vacancies (area) of office space are available. Sometimes these data are available on a quarterly basis, and sometimes they go back further on an annual basis. The frequency and dates for which this major city office supply data are available are reported in Table 1.

By using these supply data as input, the time series of completion and vacancy rates in the office market in the various localities are then calculated as the percentage of completions over existing stock, and percentage of vacancies over total existing stock, respectively. The ratio of completions over existing stock is a flow indicator of new supply that are coming on line, while vacancy rates can be viewed as an indicator of inadequate demand related to the existing stock of space.

5. Degree of securitization of commercial real estate (office). We measure the market share as asset capitalization of listed REITs in each stock exchange as a percentage of investable office stock at the current market price.¹ We focus on REITs that can be identified as “office REITs”, and for which there is no indication of investing outside the cities of our sample. The asset capitalization of each listed office REIT is calculated as the sum of the stock market capitalization at current value, debt at book value and preferred stock at book value. Since not all the office REITs specialize only in office-related real estate, to calculate the degree of asset capitalization in REITs that is accounted for by office assets, we multiply the asset capitalization for each REIT by the share of revenue in that REIT that is based on office business. The country aggregate is then the sum of the office assets of each individual REIT.

The U.S. REIT stock market capitalization and debt and preferred stock values are taken from SNL Financial. Similar estimates are taken and/or calculated for the other countries from Bloomberg. For the other major cities

¹ We are aware of the existence of a significant number of private REITs in a number of jurisdictions (particularly Japan), but we are focusing on listed exchange-traded REITs in this paper.

of the sample, the degree of securitization is then calculated by dividing the asset market capitalization of the REIT by the product of the average office stock value of each city and the total office stock area as related.

3. Development, Structure and Performance of the United States and Other REIT Markets Around the World

In this section, we provide historical and institutional details that are relevant to understanding the development of the REIT markets in the United States and other countries around the world. We aim to elucidate the key characteristics of REITs, the degree to which REIT markets can differ across countries, and how it is in some cases that REITs might have had a moderating influence on the allocation of real investment capital.

3.1 The United States REIT Market

History and Development.

REITs were created in the U.S. in 1960 as a way for individuals to invest in commercial property and as a new source of capital for income-producing property owners and developers.² REITs are trusts, and as such, taxes are not paid at the entity level as long as certain requirements are met. The most important rules are that: i) the REIT distribute most (currently at least 90 percent) of its net income to shareholders, ii) it operates as a mono-line company in terms of owning only equity or debt interests in real property, iii) the ownership of traded shares in the company cannot exceed concentration thresholds, and iv) the firm does not operate as a broker-dealer in terms of buying and selling real estate interests too frequently.

The REIT market grew very slowly during the 1960s, and was effectively ignored by most commercial property market participants. Commercial property in the United States at the time was almost exclusively held by small local operators. Financing sources were primarily insurance companies and commercial banks. Commercial property markets predictably boomed and busted every 15 years or so. For example, the 1950s was a boom period which witnessed substantial increases in supply. This was followed by a bust in the early to middle 1960s, which was then followed by another burst of growth in the late 1960s and early 1970s, followed by a crash in the mid-1970s. Mortgage REITs (REITs that held secured debt interests in commercial property) contributed to the boom and bust of the 1970s by supplying cheap

² For additional details on the structure and history of REITs, see <http://www.reit.com/REIT101/WhatisaREIT.aspx> and <http://www.reit.com/REIT101/HistoryofREITs.aspx>. Also see Chan et al. (2003, Chapter 2) for a comprehensive review of the history and structure of REITs. Krewson (2012) provides a short but excellent introduction to REITs.

and easy construction finance as closely-held subsidiaries of development firms or commercial banks.³

The bust of the 1970s gave the entire REIT sector a black eye, and created suspicion that the REIT structure was flawed and that advisors and other agents associated with REITs were conflicted and incompetent (or worse).⁴ From that time until the early 1990s, REITs were a backwater with almost no growth or visibility in the commercial property investment community. For example, U.S. equity REITs, which are REITs that hold ownership interests in income-producing property (and are the focus of our analysis), had a total equity market capitalization of only \$10 billion in 1990. This represented a market share of less than one percent in the “investable” U.S. commercial property market, estimated to be in the \$2+ trillion range in aggregate.

Details associated with the Savings & Loan (S&L) debacle of the 1980s are well known. The important aspects of the episode for our purposes are that problems were concentrated with relatively small banks, some larger insurance companies, and privately-owned commercial property firms. As a result of getting branded as shady operators in the 1970s, equity REITs (hereafter simply REITs) did not have much access to capital markets and consequently, did not participate in the boom of the 1980s. Wall Street was also not very focused on commercial real estate securitization at that time. Thus, REITs and Wall Street generally side-stepped problems associated with the S&L debacle.

In contrast, private property owners experienced “equal opportunity” financial distress, in the sense that private owners, large and small, competent and incompetent, had to contend with serious financial issues. Assistance would not be forthcoming from traditional financing sources, as they were completely sidelined, dealing with problems of their own. By the late 1980s, there were serious liquidity problems in a sector that needed to recapitalize in the worst way.

Wall Street responded by taking an off-the-shelf investment vehicle—the REIT—and using it to securitize real estate ownership interests. The reorganized firm could then access the broader capital markets—a new source of liquidity that was relatively unaffected by the S&L debacle—in order to recapitalize. The linchpin to this scheme was that a newly formed REIT with access to capital could snap up distressed assets at firesale prices from owners that had no such access to capital. Having access to liquidity when the rest of the sector had none implied significant growth opportunities, which lowered the cost of equity capital and increased initial public offering (IPO) proceeds.

³ For additional background, see Vandell (1999), <http://www.reuters.com/article/2007/08/16/us-mortgagereits-idUSN1526504220070816> and http://www.kahrrealestate.com/RER32_01.shtml.

⁴ See Chan et al. (2003, Chapter 2).

So great were the growth opportunities that IPO proceeds were generally enough to satisfy existing debt obligations, with money left over to fund new investments.

Nonetheless, potential investors were wary of REITs due to the previously discussed reputational problems. This caused investment banking firms to focus their efforts on taking public only the better managed firms that owned higher quality assets. This fact is critically important, as it laid the foundation for a sector that was credible—credible in the sense of having some of the best available talent to manage these firms, with a balance sheet that typically contained better quality assets in better locations.

Two other factors were important in terms of incentivizing distressed property owners to contribute their best assets to a REIT investment vehicle. One was that REIT rules were changed in 1986 to allow for internal management.⁵ This in effect made REITs viable going concerns, whereas the previous structure that allowed only external management made them more like a static pooled asset fund. The second is that tax rules were relaxed so that privately owned assets with a low accounting cost basis could be contributed to a REIT without immediately incurring a capital gains tax liability. Firms that used this structure are referred to as “Umbrella Partnership” REITs, or UPREITs.⁶

Structure and Performance.

This series of events created a REIT IPO boom in the United States that lasted from 1991 to the mid-1990s. Equity capitalization of the sector increased more than ten-fold during this five-year period, going from \$10 billion to over \$100 billion. Some of the most important and best-performing REITs that operate today went public in this time window.⁷ Publicly traded REITs have over the past 20 years easily outperformed the S&P 500 (with a β of less than unity); see the U.S. column in Tables 3a and 3b for corroboration of this point over the past 10 years. U.S. REITs have also handily outperformed indices of privately owned commercial property by about 3 percent per year on a leverage-adjusted basis.⁸ Today, the total REIT equity market capitalization is

⁵ See <http://www.reit.com/timeline/timeline.php> and Chan et al. (2003, Chapter 2).

⁶ In 1992, Taubman was the first firm to adopt the UPREIT structure. Taubman is also a good example of a firm that went public with a portfolio of very high quality (retail mall) assets and well known management. Again, see <http://www.reit.com/timeline/timeline.php> as well as Chan et al. (2003, Chapter 3) for more details.

⁷ Simon Property Group, a retail mall company, is a good example. It went public in 1993, raising more than \$800 million in equity capital. Today, Simon has an equity market capitalization of more than \$50 billion and represents approximately 10 percent of total market capitalization in the equity REIT sector.

⁸ For a comparison of performance private versus publicly held asset investment performance based on the 1980-1998 period, see Riddiough et al. (2005). More recently, according to the Table of the Historical Compound Annual Net Total Returns of REITs on the NAREIT website (<http://www.reit.com/DataandResearchResources/>),

approximately \$500 billion, representing approximately 15 percent of the total investable commercial property available in the United States. Although only 15 percent of the total market, REITs exert a disproportionate influence on the United States commercial property markets, in part because of the managerial talent and better quality assets that reside in the REIT sector.

Of all the operating and financing restrictions placed on REITs, including those listed in Table 2, which collates aspects of the institutional framework of REITs globally, the dividend payout requirement is probably the most important. This restriction causes firms to distribute a high percentage of available cash flow (typically more than 60 percent and often more than 70 percent) as dividends to shareholders. Consequently, REITs can be characterized as cash constrained relative to exchange-listed industrial corporations that do not have any formal obligation to distribute available cash flow to shareholders. This payout requirement in turn causes high-growth REITs to return to the capital markets on a frequent basis to raise money for investment purposes. Doing so imposes a discipline on management, in the sense that there is relatively little free cash flow available around to fund new investment (Jensen 1986). Rather, managers of active firms must go out on road shows with their investment bankers in order to convince outside investors to contribute capital to their firm.

Another important aspect of being a publicly traded firm is that access to equity capital markets allows REITs to operate at lower leverage levels than private firms. Private firms often have difficulty in sourcing reasonably priced outside equity capital, and instead, typically rely on mortgage debt with debt-to-value ratios that exceed 70 percent. This is in contrast to REITs, the majority of which operate at less than 50 percent leverage ratios. Less leverage had beneficial effects during the financial crisis, as there were only a small number of REIT bankruptcies (two or three) in a sector with well over 100 listed firms. Less leverage and financial distress among REITs undoubtedly contributed to the swift rebound in REIT prices after early 2009, whereas widespread financial distress is still haunting housing markets around the United States.

the total return on equity REITs over the last 10 years has been 9.88, while that of unlevered core properties (NPI) has been 6.96. For a study which documents that most real value in REITs was created for US investors during the new REIT era that began around 1992, see Ott et al. (2005).

Table 2 Major REIT Markets: Size and Institutional Framework

	North America		Asia Pacific							Europe				
	US	CA	AU	HK	JP	KR	MY	SG	TH	BE	DE	FR	NL	UK
Year first listed	1961	1994	1971	2005	2001	2002	2005	2002	2003	1995	2007	2003	1969	2007
No. of REITs	179	35	57	8	34	4	14	24	6	14	4	43	7	18
Mkt cap, in billions of USD	446.8	38.1	80.4	16.8	42.1	0.3	4.0	32.1	0.6	7.8	1.9	71.7	12.0	44.1
Required real estate holdings	75%	95%	Any	100%	75%	70%	75%	70%	75%	None	75%	80%	90%	75%
Required dividend payout	90%	100%	100%	90%	90%	90%	90%	90%	90%	80%	90%	85%	100%	90%
Leverage constraint	None	None	None	45%	55-60%	66%	50%	60-70%	10%	65%	55%	None	60%	None
Management structure	Mostly internal	Mostly internal	Both	External except one	External	Both	External	External	External	Mostly internal	Internal	Internal	Internal	Mostly internal
Institutional holding, 2010	67.4%	29.7%	33.4%	39.4%	65.2%	29.1%	16.9%	44.4%	24.8%	31.0%	7.9%	26.9%	NA	96.2%

Note: AU = Australia; BE= Belgium; CA = Canada; DE = Germany; FR = France; HK = Hong Kong SAR; IN = India; JP = Japan; KR = Korea; MY = Malaysia; NL = Netherlands; SG = Singapore; UK = United Kingdom; US = United States.

Sources: Ooi and Har (2010); Chan et al. (2012); EPRA (2011); Bloomberg; Calculations by authors.

What are some of the other factors that have led to the disproportionate influence of the REIT sector on commercial property markets? As publicly traded firms, there are formal governance mechanisms in place, quarterly financial reporting, analyst calls and reports, any number of talking heads featured in the media, and a general level of transparency that imposes a discipline on management. Formal governance and transparency are not the *raison d'être* of private firms.

Perhaps most important of all is price discovery which occurs through exchange traded share prices. This information, which can also create a great deal of share price volatility, is a public good that is made available to all market participants. When market participants pay attention to these price signals and incorporate them into their day-to-day investment and financing decisions, they can, we conjecture, have a moderating influence on boom-bust tendencies in markets. For example, when new office construction is announced and occurs in Washington D.C., and share prices of REITs that hold office property in Washington D.C. react negatively to this information, it sends a signal to construction lenders and other market participants that the additional supply of office space may negatively impact rents going forward. This in turn may constrain additional construction lending. In contrast, private ownership markets only provide information with a time lag, thus implying that capital misallocations can persist for longer periods of time and result in boom-bust outcomes.⁹

3.2 Other REIT Markets Around the World

While the United States experience is in many ways unique, other countries have gone to great lengths – particularly over the last decade - to develop their REIT markets. Table 2 compares the institutional framework of major REIT markets in North America, the Asia Pacific and Europe.

Institutional Characteristics

i) Age. The REIT experience in other countries is very thin compared to that of the United States, with the exception of the Netherlands and Australia, where the first REITs were listed in 1969 and 1971, respectively. In the rest of Asia and the Pacific, REITs are a recent arrival: Hong Kong Chinese, Japanese, Malaysian, Singaporean, and Thai REITs were first established between 2001 and 2005. In Europe as well, REIT legislation enabled the vehicle in France in 2003, and as recently as 2007 in the UK and Germany (Table 2).

ii) Legal Requirements. Like US REITs, Asian and European REITs are subject to strict dividend payout requirements. Unlike US REITs, REITs in

⁹ See Packer et al. (2013) for a formal test of this “moderating influence” hypothesis in the case of the United States.

many other countries are subject to caps on the use of financial leverage. These caps are generally in the neighbourhood of 60 percent. Other requirements, such as the proportion of total investment that must be in real estate, are fairly similar across jurisdictions.

iii) Management Structure. As discussed above, many US REITS came under internal management when regulations were changed in 1986. In effect, internally managed REITs became going concerns, compared to the previous externally managed static pooled asset funds. However, as can be seen in Table 2, while Europe is similar to the United States in having the internal advisor management structure, nearly all of Asia has adopted the external management structure model. Only Australia among the listed Asia Pacific countries has significant internal management, in large part due to the introduction of stapled REITS, where the asset management is carried out by an entity within the overall REIT structure.

The academic literature, which mainly focuses on the United States experience, suggests that external advisor arrangements suffer agency costs because of conflicts of interest between the adviser and the shareholders. As noted above, the United States shifted toward a structure in which internal management was predominant, although in a comprehensive sample of listed US equity REIT filings between 1987 and 2009 analyzed by Deng et al. (2011), 20% were still externally managed. Australia has also shifted.

There may yet be countervailing benefits to the external REIT structure, however. The study by Deng et al. (2011) documents more favorable loan contract terms and less stringent collateral requirements and covenants among external REITs, which suggest that external REITs are viewed as less informationally opaque and subject to fewer bondholder-manager conflicts than internally managed REITs. Furthermore, given the prevalence of the external REIT structure in Asia, it would appear that in the case of these countries, the benefits of external advisorship outweigh the agency costs.

iv) Institutional Holdings. A distinctive feature of US REITs relative to their continental European and North American counterparts is their high level of institutional holdings. Yet most Asian REITs also share this feature. The percentage of institutional holdings in REITs in many Asian countries is quite high, ranging from 30% in South Korea to 40% in Hong Kong and Singapore to around 60% in Japan. With the exception of the UK, institutional REIT holdings in Europe are relatively low: French and Belgian REITs have institutional ownership of 25-30%, while those of Germany are less than 10%.

Are these differences in institutional features associated with the pricing performance of REITs at issuance? One of the major stylized facts coming from the REIT literature is that the IPOs of REITs in Europe and the United States have been significantly more underpriced than those in the Asia-Pacific. One reason offered for this differential underpricing is that European and US

REITs are internally managed and more operational in nature, while Asian REITs are externally managed and fund-like in nature (Chan et al. 2012). However, there does not appear to be a relationship between the underpricing of REIT IPOs and institutional holdings of REITs.

Market Characteristics

i) Market capitalization and IPO volumes. The United States dominates the international REIT landscape, with nearly 180 listed REITs which amount to \$447 billion in equity capitalization. This is more than half of total global REIT equity market capitalization (Table 3a). Far behind that, yet well above any other country, Australia has 57 listed REITs with \$80 billion market capitalization, thus occupying 10% of the total REIT market capitalization. The markets in Europe are still slightly larger than those in emerging Asia, with French and UK REITs (43 and 18 each) respectively accounting for 9% and 5% of the total market capitalization. There are 34, 24, and 8 listed REITs in Japan, Singapore and Hong Kong, respectively, roughly accounting for 5%, 4% and 2% of the total REIT market capitalization.

Despite the rapid growth of Asian REIT markets in the 2000s, the United States has still maintained dominance in the flow of new capital vis-à-vis REIT IPOs. Between 2001 and 2010, the United States had 80 IPOs for a total value of around \$21 billion, Japan had 42 REIT IPOs for a total value of \$15 billion, Australia had 38 REIT IPOs for a total value of nearly USD \$6 billion, Singapore had 21 for a total value of \$6 billion, and Hong Kong had 7 for a value of \$5 billion. In France, the numbers were far lower, at 16 IPOs for \$1.5 billion. In the UK, 10 REITs went public for \$1 billion while in Belgium, 7 REITs raised \$300 million. Clearly, the United States market remains the largest, but in terms of new IPO flow, the Asian markets have overtaken many of the European markets.¹⁰

ii) Returns. Table 3a also reports the return performance based on the national REIT indices for the major REIT markets in North America, Asia and Europe. In the table, we examine the past decade of returns in two periods between mid-2002 (when the J-REIT index first became available) to mid-2012. We divide up the period into two five-year periods, from mid-2002 to mid-2007, when REIT markets globally were quite robust (as were financial markets generally); and 2007-2012, when REITs performed nowhere near as well, due to the global financial crisis and the coincident bust in the real estate markets.

¹⁰ The data in the paragraph are based on Table 3 of Chan et al. (2012).

Table 3a Major REIT Markets: Market Characteristics (A)

	North America		Asia Pacific							Europe				
	US	CA	AU	HK	JP	KR	MY	SG	TH	BE	DE	FR	NL	UK
Mkt cap, in billions of USD	446.8	38.1	80.4	16.8	42.1	0.3	4.0	32.1	0.6	7.8	1.9	71.7	12.0	44.1
(% of global REIT)	54.8%	4.7%	9.9%	2.1%	5.2%	0.0%	0.5%	3.9%	0.1%	1.0%	0.2%	8.8%	1.5%	5.4%
(% of country Mkt)	3.0%	2.1%	6.5%	1.1%	1.2%	0.0%	1.1%	6.1%	--	3.0%	0.1%	3.6%	2.5%	1.4%
IPO volume (2001-10)	21.3	2.0	5.8	4.8	15.5	0.7	1.3	5.6	1.9	0.2	--	1.6	--	0.9
Returns														
REITs (2002-2007)	13.2%	11.3%	8.9%	29.2%	20.1%	12.0%	--	34.0%	1.2%	7.1%	--	43.0%	16.0%	--
Net of market	3.5%	-3.1%	-5.2%	-1.3%	8.6%	-5.3%	--	7.8%	-10.1%	-6.7%	--	31.2%	9.0%	--
Net of property co.	-14.1%	-9.0%	-1.9%	-7.5%	-7.8%	--	--	-19.1%	-2.0%	1.7%	--	17.8%	4.4%	--
REITs (2007-2012)	-3.0%	2.2%	-17.1%	8.7%	-16.2%	-2.0%	20.3%	-9.3%	0.5%	-4.5%	-20.5%	-8.6%	-13.8%	-15.0%
Net of market	-1.0%	5.9%	-9.1%	11.4%	-1.1%	-3.6%	9.1%	-5.8%	-8.2%	5.1%	-12.4%	2.9%	-1.5%	-11.3%
Net of property co.	-0.1%	7.2%	0.4%	13.9%	2.3%	--	4.4%	1.5%	-3.9%	0.6%	-9.2%	11.7%	0.8%	6.5%
REITs (peak to trough)	-75.6%	-58.9%	-77.1%	-38.5%	-71.0%	-43.7%	--	-73.8%	-14.0%	-42.4%	-88.3%	-68.2%	-69.2%	-81.5%
Volatility														
REITs (2002-2007)	2.3%	2.0%	1.6%	3.0%	1.8%	6.1%	--	2.4%	1.5%	1.4%	8.7%	3.6%	2.0%	--
Market	1.8%	1.6%	1.3%	1.8%	2.3%	3.2%	--	1.7%	2.9%	2.1%	2.3%	2.2%	2.4%	--
Property company	2.9%	2.0%	1.6%	2.5%	4.1%	--	--	2.5%	4.7%	1.0%	2.5%	1.6%	1.7%	--
REITs (2007-2012)	5.2%	3.3%	4.3%	3.3%	4.5%	6.9%	1.8%	4.1%	1.4%	2.6%	7.7%	3.6%	4.4%	4.6%
Market	3.3%	3.2%	3.0%	3.7%	3.2%	3.8%	1.5%	3.1%	3.7%	3.6%	3.6%	3.6%	3.8%	3.3%
Property company	7.2%	4.6%	4.3%	5.1%	5.6%	--	2.9%	4.1%	6.0%	1.7%	2.7%	4.5%	5.1%	4.8%

Note: AU = Australia; BE= Belgium; CA = Canada; DE = Germany; FR = France; HK = Hong Kong SAR; IN = India; JP = Japan; KR = Korea; MY = Malaysia; NL = Netherlands; SG = Singapore; UK = United Kingdom; US = United States.

Sources: EPRA (2011); Bloomberg; Datastream; calculations by authors

Most REIT markets performed extremely well in the first period under examination, peaking in mid-2007 and showing a great deal of co-movement. For example, from 2002-2007, the Japanese REIT index rose by more than 20% on a year-over-year basis, and while the United States market also scored a very robust 13.2% annual rate of appreciation. The Australian market was more subdued at 9%. A few European markets also saw remarkable appreciation, with France showing a 43% annual rate of return. We also see exceptional performance in the truncated (from 2005) cases of Hong Kong and Singapore, of around 30% annualized returns in both cases respectively. In the cases mentioned above, with the exceptions of Australia and Hong Kong, REITs outperformed their respective national stock indices.

However, subsequent to mid-2007, national REIT indices generally fell more than the aggregate national market indices. In Japan, Australia, France, Germany, the Netherlands, Singapore, and the UK, negative annual return rates ranged between -9 and -21% - declines were well in excess of the respective broader market indices. Two important exceptions to the general severe downward trend were the United States, as previously discussed, and Hong Kong, where the recovery in real estate values after the short-lived crisis led to an increase in the value of REITs over the period of 9% per year.

iii) Return Volatility. In addition to return, investors of course concern themselves with investment risk. Variation in returns over time, or return volatility, is a predominant investment risk characteristic. It comes as little surprise that the standard deviation of weekly returns, or volatility, turned strikingly higher for REITs post-crisis across almost all of the sample countries.

One of the canonical stylized facts generated by the empirical literature on REITs over the past few decades, at least those focused on Australia, Japan and the United States, is that the volatility of REIT share prices is less than the overall market (see Sawada (2008) for Japan, Newell (2010) for Australia, and Chan et al. (2003) for the United States). To check whether that has still been the case over a period of high general market volatility, we examine the weekly standard deviation of percent returns for various national indices, including the REIT index (Table 3a).

In fact, it appears that over the past ten years, REITs have generally experienced higher return volatility than the major benchmark equity indices. The REIT indices of Australia, Canada, Germany, France, the United Kingdom, Japan, Korea, Malaysia, Singapore, and the United States have all been significantly more volatile than the benchmark market indices. The only exceptions are Belgium, Hong Kong and Thailand. For some jurisdictions, the riskier performance of REITs is a post-crisis (2007-2012) phenomenon, as a somewhat larger group of REIT indices have lower volatility than the national index – Belgian, Japanese, Dutch, and Thai – when the earlier period (2002-2007) is examined. However, the REIT volatility of Australia and the United

States was higher than that of market indices even during the earlier period, in sharp contrast with the relations documented in previous studies.

All of that said, it is generally true that the volatility of national REIT indices is usually less than the comparable indices for listed non-REIT property market developers in the sample countries. For example, whereas return volatilities are roughly equal in Australia, REIT indices are significantly less volatile than listed non-REIT property market developer indices in the United States, Japan and Singapore. For a number of European countries (France, the Netherlands), as well as Hong Kong, the REIT indices showed greater volatility than non-REIT property developer indices ahead of the crisis, but then became relatively less volatile after mid-2007.

iv) Correlations and Market Betas. Commercial real estate is thought to have attractive portfolio diversification qualities due to relative low correlations with stocks and bonds. However, correlations have increased in recent years, at least in part due to the systemic nature of the financial crisis. With this in mind, in this sub-section, we examine the degree to which REITs around the world are correlated with broader market indices – with particular focus on their movement around the onset of the financial crisis.¹¹ We also consider the relations of REITs with indices of listed non-REIT property developers, a less regulated sector that is presumably less transparent and contains greater idiosyncratic risk.

Table 3b reports the correlation between the REIT return index and a benchmark equity return index of each country, with the returns divided into the two five-year sub-periods as before. One fact that immediately stands out is that the correlation coefficients between the REITs and market indices increased for almost all countries subsequent to the crisis. Extremely low REIT-MKT index correlations in the pre-crisis period for countries such as Belgium and France, at around 15-20% before the crisis, soared to 55% and 77%, respectively, during and after the crisis.

Neither the marked increase nor the high correlation of REIT returns with the equity market in the later period are limited to any single region. After the United States, with a correlation of 83% in the latter period, the next six highest correlation coefficients include three from Europe and three from Asia and the Pacific.

¹¹ For recent work that documents the time-varying correlation of REIT and stock returns in the United States context, see Fei et al. (2010), and Case et al. (2012).

Table 3b Major REIT Markets: Market Characteristics (B)

	North America		Asia Pacific							Europe				
	US	CA	AU	HK ⁴	JP	KR	MY ⁴	SG ⁴	TH ⁴	BE	DE	FR	NL	UK
Correlation¹														
REITs														
(2002-2007)	0.55	0.32	0.56	0.28	0.23	0.39	--	0.55	0.11	0.18	0.11	0.14	0.34	--
(2007-2012)	0.83	0.62	0.66	0.47	0.63	0.29	0.32	0.70	0.16	0.55	0.34	0.77	0.73	0.71
Property companies														
(2007-2012)	0.78	0.69	0.67	0.92	0.82	--	0.73	0.87	0.68	0.33	0.59	0.59	0.47	0.62
Beta²														
REITs														
(2002-2007)	0.67	0.54	0.53	0.36	0.16	0.85	--	0.80	0.12	0.12	0.57	0.24	0.32	--
(2007-2012)	1.32	0.69	0.91	0.42	0.94	0.77	0.51	1.03	0.03	0.45	1.17	0.88	0.88	1.08
Property companies														
(2007-2012)	1.74	0.94	0.93	1.17	1.46	--	1.26	1.15	1.21	0.28	0.56	0.96	0.74	1.10
Market share of office REITs, 2011³														
	12.1%	--	18.9%	2.3%	3.4%	--	--	--	--	9.1%	2.3%	2.7%	5.8%	5.8%

Note: AU = Australia; BE= Belgium; CA = Canada; DE = Germany; FR = France; HK = Hong Kong SAR; IN = India; JP = Japan; KR = Korea; MY = Malaysia; NL = Netherlands; SG = Singapore; UK = United Kingdom; US = United States.

¹ Correlations of daily logarithmic changes of the price indices. ² Beta estimates of simple regression of return on various assets classes on return on market. ³ Share of office space held by office REITs. ⁴ Due to availability of the data, sample periods for Hong Kong SAR, Malaysia, Singapore and Thailand started on 25 November 2005, 7 July 2010, 28 July 2005 and 19 November 2003 respectively.

Sources: Bloomberg; CB Richard Ellis; Datastream; calculations by authors.

Relative to listed non-REIT property market developers, REITs in Asia often show less correlation with the broader market, thus suggesting attractive diversification benefits to investors who are seeking property market exposure. In fact, this was the case without exception among Asian countries. Countries where the correlation of the REIT index with the market is significantly lower than the correlation of indices of listed non-REIT property developers with the market included Hong Kong, Japan, Malaysia, Singapore and Thailand.¹² However, the two largest REIT markets of Australia and the United States did not follow the pattern, with roughly equal REIT-MKT and non-REIT property developer-MKT correlations. In Europe, REIT correlations with the market were likely to be greater than those between listed non-REIT property developers and the broader market indices.

Overall, it appears that while REITS do generate some diversification benefits, these benefits were greatly diminished during the financial crisis. This in turn, suggests that the declines in correlation that were documented in earlier studies (for instance, in Australia, the correlation was 0.24 between 1994-2006, compared to 0.71 between 1985-1992; Newell 2010) were perhaps overstated. The time-varying results are consistent with the increased sensitivity of REITs to small cap equity returns during market downturns, as documented in Clayton and MacKinnon (2001). At the same time, REITs show lower correlations as compared to listed non-REIT property developers—this is particularly the case for the Asian REIT markets in our sample.

Table 3b also reports the REIT market beta – the coefficient when excess returns of the national REIT index are regressed on a constant plus excess returns to the national market index – and compares them with the market beta of the listed non-REIT property development companies. REIT betas are, in general, seen to be less than listed proper developer betas. Interestingly enough, that is clearly the case for all of the Asian markets, as well as the United States and Canada. For instance, while the market betas for Japan, Singapore and Hong Kong REITs are all well below one, the betas for listed non-REIT property development companies of the same countries are all above one. By contrast, the market betas for some of the European listed non-REIT property development companies are below those for the REITs, thus suggesting that European REITs may be operating with higher financial leverage than listed property developers – consistent with the report of a private sector industry advisor (Green Street Advisors, March 2012). Just as it had with the correlation coefficients, Australian REITs in the second largest REIT market showed market betas which are quite similar to those of listed non-REIT property developers.

¹² The lower sensitivity of Thai REITs to the broader market returns compared with those of Hong Kong and Singapore recalls Zhu's results (2006) for a sample of Asian economies that those with less flexible housing markets show less sensitivity of house prices to broader market conditions.

v) REIT Office Market Share. Finally, we see in Table 3b that there is considerable cross-country variation in the degree of office market securitization vis-à-vis REITs. In this respect, Australia stands out, with the latest estimate of around a 19% REIT office market share—although that number is itself well below 32% scored earlier before the global financial crisis. The United States is the second most securitized office market, with around a 12% market share accounted for by REITs. Some European countries make up a third group close behind the U.S. – with Belgium, the United Kingdom, and the Netherlands estimated to have between 5 to 9 percent of their office market being securitized by REITs – while the remaining Asian countries (Japan, Hong Kong) – join Germany and France in a group of countries with relatively less securitized office markets.

4. Office Supply Dynamics Around the World: An Overview

Packer et al. (2013) formally examine the link between REIT market development and office supply in the United States, and provide evidence that REIT market development has had a moderating effect on supply outcomes. We would have liked to run similar tests across all the countries covered in this paper, but for most countries, the time series are simply not long enough. So, instead, we document office supply dynamics from around the world, and add case studies as well as regression analysis of the relation of REIT markets and office supply dynamics in the three countries—Japan, Australia and France—which have prominent REIT markets and for which we have sufficiently long time series.

4.1 Construction Activity and REIT Market Penetration

In this section, we specifically examine the dynamics of office supply in the United States and selected European and Asian countries by using data purchased from the CBRE. These data are used together with REIT office price data to construct a time series of REIT office market share. For 7 out of the 13 sample countries with construction data, we have the numbers going back to the early 1990s. In the case of Japan, the data go back to the late 1990s. For the remaining five, three of which are from Asia (Hong Kong, Thailand, Korea), the construction data go back less than 10 years. In all of the sample countries with the exception of Australia and the United States, neither the REIT index data nor the market share data go back beyond 2000. For five countries, they do not extend before 2005. In the case of the REIT indices, these latter constraints reflect the relative youth of the REIT markets.

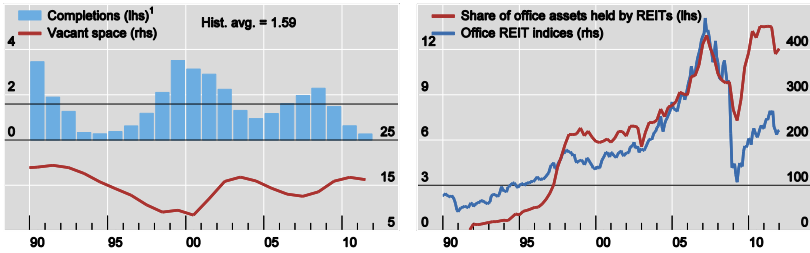
The completion data suggest that, at least for those countries for which we have 20 or more years of data, the commercial property cycle has been much

more subdued over the past 15 years than previously. In the United States, the peaks of net new supply of commercial office property over the past 20 years - 3.5% in 1999 and 2.3% in 2008 - were well below the levels of 1980s when completions on occasion exceeded 10% of the stock. In Australia, Canada, France, Singapore and the UK, net new supply offered in the early 1990s clearly exceeded the peaks of later cycles, and the troughs in net new supply that followed were lower and longer lasting than those seen later. In Japan, the Tokyo data from the CBRE do not predate 1998. However, from the government data, we know that annual investment in private sector (non-manufacturing) building construction between 1990-1992 exceeded that of 2002-2003—the peak of Tokyo office construction over the past decade—by a factor of nearly three times.

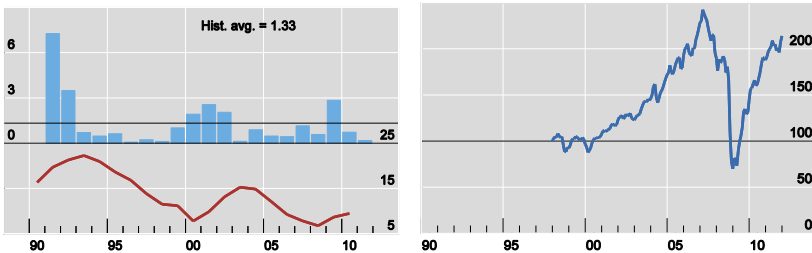
Vacancy rates tell the same story. As noted in Ellis and Naughtin (2010), vacancy rates can stay elevated well beyond the end of an economic downturn. This is because of the lags in commercial property construction and the time that it takes for excess supply to be absorbed by the market. In Figure 1, we see in the 1990s that in Australia, Canada, France, the UK and the United States, vacancy rates were extended for a long period after the 1980s boom, all hitting a peak over the past 21 years in the early to mid-1990s.

Figure 1 Commercial Real Property, Office: Completions, Vacancies, REIT Prices and the Share of Office Assets Held by REITs

United States



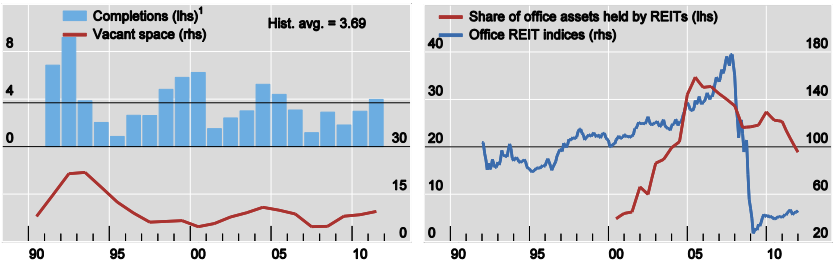
Canada (Toronto)



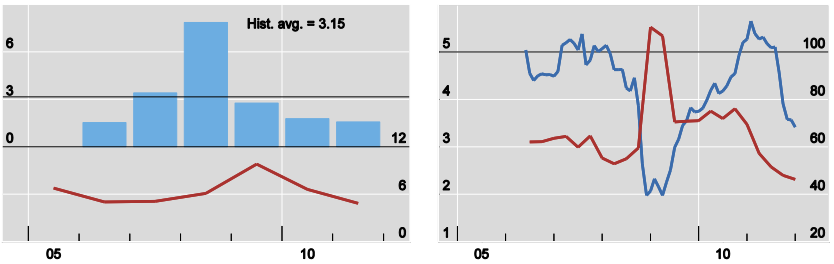
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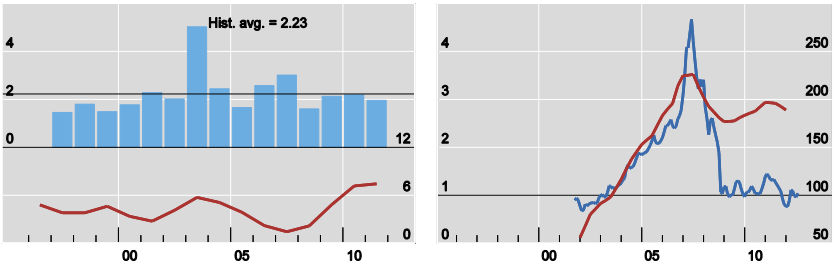
Australia (Sydney)



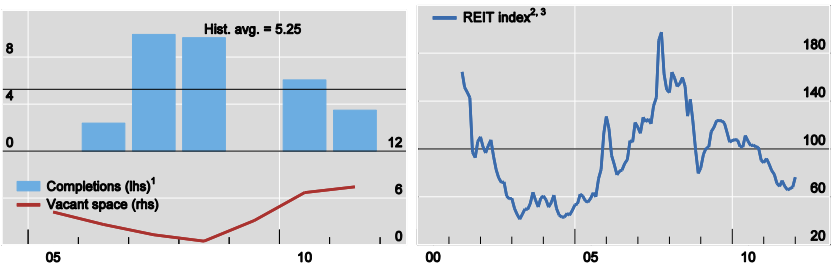
Hong Kong SAR



Japan (Tokyo 23 wards)



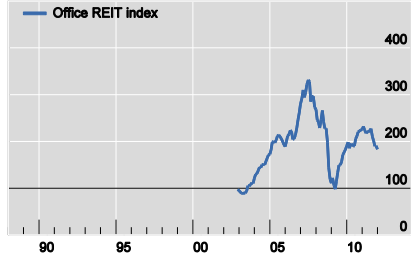
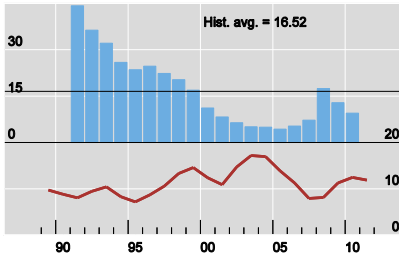
Korea (Seoul)



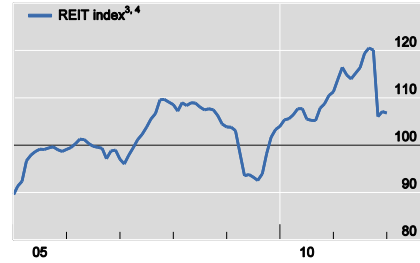
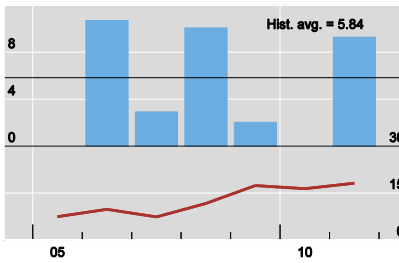
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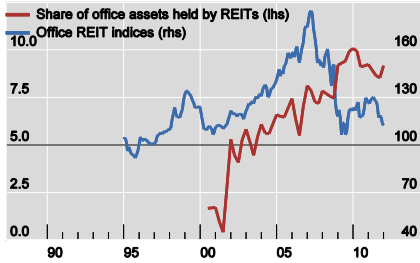
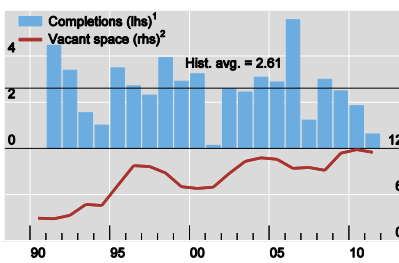
Singapore



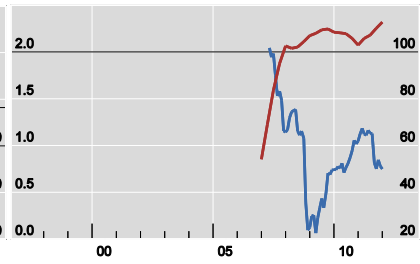
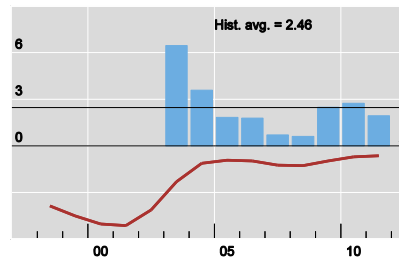
Thailand (Bangkok)



Belgium (Brussels)



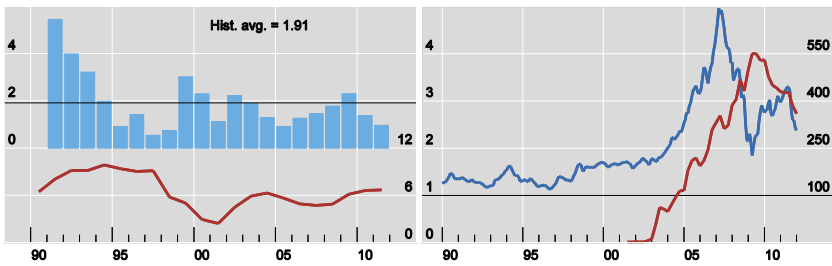
Germany (Frankfurt)



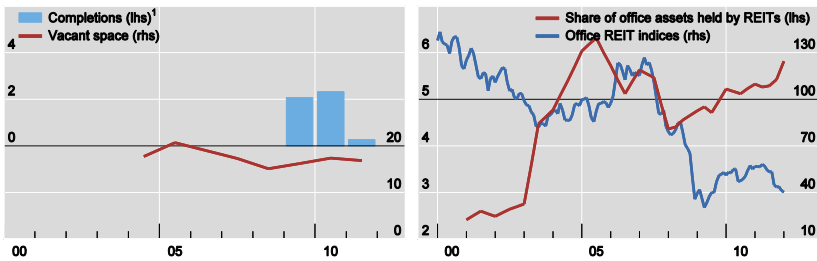
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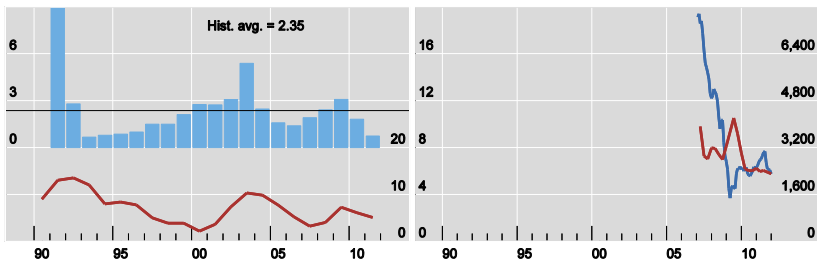
France (Paris)



Netherlands (Amsterdam)



United Kingdom (London, central)



Note: ¹ As a percentage of its total stock, beginning of the period. ² For Belgium, it is availability rather than vacancy from 2008. ³ Korea Real Estate Investment Trust Co, KOCREF REIT VIII, KR2 Development REIT Co Ltd and Golden Narae Real Estate Development Trusts Co Ltd. ⁴ Sum of the market capitalizations divided by the sum of the number of shares. ⁵ Private and public sector office space under construction. ⁶ TICON Property Fund, Millionaire Property Fund, MFC Nichada Thani Property Fund and Bangkok Commercial Property Fund.

Sources: CB Richard Ellis; Bloomberg; Datastream; authors' calculations.

Office construction cycles appear to be correlated across the country samples, but only imperfectly. In focusing on the last 10 years and the larger sample, there is some tendency for construction to peak around the financial crisis, but not exclusively so. The office construction completions of Hong Kong, Korea, Singapore, and the United States all peaked in 2007-2008, those Canada and France later in 2009. However, in the same decade, the UK, Australia, Germany, and Japan (Tokyo) peaked earlier in 2003-2004.

By contrast, the price of prime office real estate, as captured by REIT indices, is much more highly correlated across countries. With the sole exception of Hong Kong, where the REIT index did peak at the same time, but subsequently recovered, all of the office REIT indices of the sample topped out around the same time in mid-2007. Similarly, most of the markets bottomed out around the same time, in early 2009. The fall was sharp just about everywhere, with REIT markets collapsing between around 60%-75% in eight cases, and more than that in two others (Figure 1). What has differed somewhat, however, has been the extent of the recovery from the collapse, with a minority of countries recovering significantly more than the others. While Germany and Singapore gained back around half of the losses, and Canada close to 75%, and Hong Kong more than 100%, all the other REIT markets in the sample (other than the United States) have stagnated since the collapse, gaining back only a small fraction or none of the losses.

Figure 1 also makes clear that the penetration of REITs in the various jurisdictions is not a monotonically increasing function, but rather subject to declines on occasion. In the case of Australia, France Japan, the Netherland, the United Kingdom, and the United States, declining measures of REIT penetration were apparent during the sharp fall in prime office valuations from mid-2007. This suggests that the valuation of assets securitized by REITs had fallen more than other office assets during the sell-off period. However, such a pattern was not invariably the case. In Belgium and Germany, REIT share penetration measures rose even when REIT indices were declining in the late 2000s, and in Hong Kong, the degree of REIT penetration seems inversely related to office real estate pricing. In the next section, we will explore the relationship of the degree of REIT penetration in the office markets and the (office) construction cycle in three of the four largest REIT markets.

4.2 Case Studies

In this section, we highlight the connection between REIT market development and supply response in three countries that have developed REIT markets and for which supply data are available. The three highlighted countries are Australia, Japan and France.

Australia. The data for Australia go further back than most other countries of the sample, to the tail end of the commercial property boom in the early 1990s. As mentioned earlier, construction completions in Sydney at that time

were greater than the peaks of the two cycles that followed over the next two decades.

REITs in Australia have long had relatively significant penetration into the office market. Figure 1 demonstrates that the degree of office market penetration markedly increased in the first half of the 2000s, rising from around 5% in 2000 to over 35% in 2005. Indeed, Chan et al. (2012) document a surge in Australian REITs that came into the market over that period of time, with 25 REIT IPOs which amounted to \$3.3 billion. At the same time, there was a dramatic increase in the so-called “stapled” REITs, whereby the stock of the REIT was connected to the stock of its management company. This effectively allows for an internal management structure that can take more property development risk, compared to the traditional limited property trust (LPT) model in Australia that had involved external managers. According to Newell (2010), between 2004 and 2007, “stapled” REITs grew from 29% to over 75% of overall LPT (A-REIT) capitalizations.

As was true across most countries, the prices of prime properties as embedded in REITs fell from mid-2007, but the earlier rise in Australia had not been as dramatic. Between 2000 and 2007, the REIT index grew by around 70%, a far cry from the many multiples growth evident over the period in Canada, France, Japan, Singapore, or even the United States. However, the collapse between June 2007 and March 2009 of around 75% was among the sharpest of all the REIT markets under consideration in the study, as well much larger than the 50% decline scored by the national index over the same time period. At the same time, the share of properties securitized via REITs declined from above 30% to around 20%, largely reflecting the decline in the value of properties held by REITs relative to other more illiquid properties. By contrast, based on the movement of construction completions to stock ratio, the office construction cycle was not hit too hard by the decline in REIT prices, for by 2011, the starts had snuck back over the twenty-year average.

Japan. Data on construction starts for Japan begin around 1996, just after the bubble and burst period breakpoint identified by Shimizu and Nishimura (2007) for commercial property in Tokyo. The REIT market in Japan began in late 2001 with the index available from 2002. Thus, we have roughly ten years of data after the introduction of REITs.

The early period of office REITs corresponds to both relatively robust construction and rapid appreciation of REIT assets. After four years of relative stagnation from 1996, construction as a share of total stock picked up to well over 4% in 2003, more than twice the period average (see Figure 1). Although completions were more subdued subsequently, they did generally remain above average through 2007, thus hitting the second highest share of new construction completions over the period in that year.

Similarly, REIT markets were quite strong in Japan over the period from their introduction in 2001, rising from initial index values of just over 50 to over 250 by mid-2007. From the IPOs of two J-REITs in September 2001, the total market size had increased to 41 J-REITs by March 2007. Total market capitalization was more than 20 times the original size. By 2007, J-REITs had also grown to about one-third of the total market capitalization of all real estate related companies listed on Section 1 of the Tokyo Stock Exchange. As can be seen in the right hand panel for Japan in Figure 1, our estimates are that the amount of all commercial real (office) securitized by REITs had grown to around 3.5% of all available office property at that time.

Price discovery appears to have considerably improved after the listing of J-REITs. According to a study group, the reporting of real estate appraisal and end of period income and expenditures became common for all properties owned by J-REITs, which led to a large growth of information and data availability on all commercial property (J-REIT Product Property Study Group, 2007). This is consistent with the view that since the introduction of REITs in Asia, the liquidity and efficiency of the real estate markets have more generally increased (Ooi et al. 2006).

From mid-2007, however, the REIT market took a brutal tumble, with the index falling from a peak around 285 in mid-2007 to around 150 by March 2008, and then to around 86 by March 2009 in the wake of the failure of the Lehman Brothers. The percentage fall in both cases, -47% in the first and -43% in the second period, was significantly greater than that endured by the Japanese equity market index (-30% and -36%, respectively). The recovery in the REIT index since early 2009 has been relatively modest by comparison. Concurrent with the J-REIT crash, there was also some consolidation on the real side: office construction spending since 2007 has been subdued and below the period average for each year in the 2008-2011 period, although the decline in spending since the collapse in REIT values was much less pronounced than that seen in REIT valuations.

In October 2010, the Bank of Japan took the unprecedented initiative of announcing quantitative easing measures that included the purchase of J-REITs. The total amount of J-REITs to be purchased was 110 billion yen, a relatively small amount compared to other assets being purchased,¹³ but the policy move still gained considerable attention in the market. In April 2012, the amount for REIT purchases was raised to 120 billion yen.

¹³ The Bank of Japan had also promised to purchase 1.6 trillion yen worth of TSE index-linked exchange traded funds (ETFs), 2.9 trillion of corporate bonds, 2.1 trillion of commercial paper, and 33.5 trillion of government bonds and notes. In April 2012, the amount for ETFs was raised an additional 200 billion, and for REITs, an additional 10 billion.

The justification of the action was that it was for the purpose of reducing risk premia in financial markets. Indeed, the view of a number of analysts was that J-REITs were undervalued compared to other REITs, with price to net asset values of 0.87 at the time of the intervention. To ensure that the Bank of Japan purchases did not distort normal market functioning, the maximum amount of each J-REIT to be purchased was not to exceed 5 percent of the total amount of that J-REIT issued. Purchases of REITs were promised to be roughly proportionate to the total market value of each J-REIT issued.

The announcement of the Bank of Japan purchases in early October generated a bump of around 3% in J-REIT prices; in fact, by the end of the year, J-REITs had risen nearly 20% in value. The Bank of Japan support certainly seemed good for J-REIT stocks, although it had much less impact on the wider equity market. As for land prices, they fell by about 2% in Tokyo in 2011, much less than the 5-7% drop seen in 2010. It is not clear the extent to which the Bank of Japan action contributed either to this deceleration or the lack of a dramatic fall in construction spending over the period.¹⁴

France. Finally, we also estimate the model for France, the third largest REIT market in the world at US \$73 billion in equity market capitalization. After their introduction in 2003, the degree of REIT market penetration steadily increased to around 4% by 2010 (see Figure 1). Like in many other countries, in France, commercial office supply cycles over the past two decades have peaked at much lower levels than during the late 1980s/early 1990s boom. Office prices as captured by the REIT index spiked as did many others in mid-2007, although construction completions as a percent of stock continued to increase, and peaked in 2009.

4.3 Formal Test

To formally examine the connection between REIT market development and construction activity, we develop an empirical test for these three countries. We use the same specification as Packer et al. (2013), who study the United States office REIT market and find that information contained in the REIT share prices affect real resource allocation decisions made by commercial property market participants. Specifically, the results show that REITs have exerted a moderating influence on supply outcomes in rising and falling asset markets in the United States. Our intention is to consider whether such a pattern occurs in other markets as well.

¹⁴ What is clear is that the Bank of Japan has thus far reported unrealized profits on its holdings of REITs, according to its publicly released earning reports. The Bank booked a Y200 million unrealized gain on its holdings between April 2011 and March 2012, more than making up for the Y100 million in losses a year earlier.

The empirical model specification is as follows:

$$S = f(P, C, M)$$

where S denotes the supply of new office space, P is the value of office property, C is the construction cost and M is the REIT market share. In all three country-level cases, the benchmark models include asset price and construction cost as explanatory variables.

We include up to eight quarters of lags for all RHS variables in recognition that it takes time to plan and build new office space. The number of lags included for any given variable is determined by maximizing the adjusted R^2 jointly across all variables in the regression. We also include an AR(1) process in the specification to correct for possible serial correlation in the error term.

All the variable coefficients signs from the benchmark models are as expected, but only the construction cost variable coefficient from Australia is statistically significant (Table 4). The augmented model includes two new variables that differ only on whether office prices increase or decrease from the price of the last quarter. A price increase is denoted as a “strong market” and a price decrease is denoted as a “weak market”. These terms are interacted with the REIT market share variable, where market share is intended to measure the influence that the REIT market has on real resource allocation decisions. The “moderating influence” hypothesis is that increasing market share dampens supply response in a strong market (negative coefficient sign) and strengthens supply response in a weak market (positive coefficient sign).

The “moderating influence” hypothesis is most strongly supported by the Japanese data (see the second column under Japan in Table 4). Specifically, in Japan, the market share of REITs does appear to be associated with subdued construction spending when office prices are rising as well as increased spending when assets are falling. Both of the relevant coefficients are statistically significant.

However, the relationships are not as impressive in Australia and France (Table 4). Although the variables of the market share in boom versus bust periods have the signs that would be expected, they are not statistically significant, and the explanatory power of specifications including the market share variables is barely improved over simple benchmark specifications. This is both in contrast to the above-mentioned results for Japan and those reported elsewhere for the United States (see Packer et al. 2013), where the addition of REIT market-share variables significantly increased the explanatory power of the model.

Table 4 Regression Models for Construction Completions

	Australia				Japan				France			
	Benchmark		With share		Benchmark		With share		Benchmark		With share	
	Coeff	lag	Coeff	lag	Coeff	lag	Coeff	lag	Coeff	lag	Coeff	lag
Constant	3.656 *** (0.267)		2.962 *** (1.008)		4.969 * (0.159)		4.776 ** (0.214)		5.051 *** (0.186)		5.087 *** (0.327)	
Sum of current & lagged Δ REIT price	3.188 (2.120)	3	10.032 ** (4.781)	8	0.63 (1.005)	1	9.959 ** (2.683)	5	0.378 (0.685)	1	2.685 ** (1.235)	1
Sum of current & lagged Δ construction cost	-38.3 ** (15.1)	1	-18.45 (11.31)	0	-3.806 (3.465)	6	-1.029 (1.074)	1	-0.548 (6.081)	0	-5.469 (6.528)	0
Sum of current & lagged market share \times StrongD1			-0.032 (0.031)	8			-0.243 * (0.127)	6			-0.014 (0.144)	1
Sum of current & lagged market share \times WeakD1			0.107 (0.076)	8			0.452 ** (0.181)	6			0.183 (0.158)	1
ρ	0.64 *** (0.108)		0.501 *** (0.172)				-0.45 ** (0.181)		0.797 *** (0.072)		0.817 *** (0.076)	
R^2	0.36		0.45		0.23		0.51		0.64		0.69	
Adjusted $-R^2$	0.29		0.29		0.11		0.34		0.61		0.64	
s.e. of regression	0.65		0.57		0.48		0.36		0.31		0.31	
Durbin-Watson	1.55		1.64		1.64		1.79		1.84		1.85	
Sample (observation)	Q2 97–Q4 11(59)		Q3 02–Q4 11(38)		Q2 02–Q4 11(39)		Q4 03–Q4 11 (33)		Q3 93–Q4 11 (74)		Q2 97–Q4 11 (59)	

Note: The dependent variable is the level of log square feet of construction completions for office. The coefficients of seasonal dummies are not shown. Coefficient standard errors are in parentheses. ρ is the estimate of the coefficient of first-order autocorrelation in the error term.

5. Conclusion

In this paper, we consider the securitization of commercial property equity interests through the so-called listed REIT market. Pulling together data from a large number of sources, we analyze commercial property construction and REIT markets from the Asia-Pacific, Europe and North America. We also conduct several detailed case studies, with a particularly in-depth focus on the United States, Australia, Japan and France.

In the United States, the REIT sector has shown exceptional long-term performance, likely due to formal and transparent governance mechanisms, lower financial leverage, and a concentration of management talent in the sector. In contrast to other regions, the general tendency in Asia is to manage assets through an external advisor structure. REITs in Europe are distinguished by a low level of institutional ownership. Many market performance metrics are strikingly similar across REITs; for example, REITs in most countries showed greatly diminished diversification benefits during the global financial crisis.

We also document a general pattern of reduced levels and time-series variation in office construction activity across many countries over the past 20 years. While evidence suggests that the development of the REIT sector may be responsible for greater stability in the United States and Japan, we do not find similar evidence in Australia and France, which suggests that the importance of REIT market development in ameliorating boom-bust cycles in commercial property construction likely depends on the structural characteristics of those markets.

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References

- Case, B., Yang, Y. and Yildirim, Y. (2012), Dynamic Correlations Among Asset Classes: REIT and Stock Returns, *Journal of Real Estate Finance and Economics*, 44, 3, 298-318.
- Chan, S. H., Erickson, J. and Wang, K. (2003), Real Estate Investment Trusts: Structure, Performance, and Investment Opportunities, *Oxford University Press: New York*.
- Chan, S. H., Chen, J. and Wang, K. (2012), Are REIT IPOs Unique? The Global Evidence, unpublished manuscript.
- Clayton, J. and MacKinnon, G. (2001), The Time-Varying Nature of the Link between REIT, Real Estate and Financial Asset Returns *Journal of Real Estate Portfolio Management*. 7, 1, 43-54.
- Deng, Y., Hu, M. and Srinivasan, A (2011), Information Asymmetry and Organizational Structure, unpublished manuscript
- Ellis, L., and Naughtin, C. (2010), Commercial Property and Financial Stability – An International Perspective, *RBA Bulletin*. 25-30
- European Public Real Estate Association (2011), Global REIT Survey.
- Fei, P., Ding, L. and Deng, Y. (2010), Correlation and Volatility Dynamics in REIT Returns: Performance and Portfolio Considerations, *Journal of Portfolio Management*. 36, 113-125.
- Green Street Advisors (2012), Lost in Translation, Heard on the Beach, Industry report.
- Jensen, M. (1986), Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers, *The American Economic Review*, 76, 2, 323-329.
- J-REIT Product Property Study Group (2007), Report on the Historical Transformation and Prospects of the J-REIT Market – An Analysis and Study Applying 5 Years of Data from the Birth of REITs, Association for Real Estate Securitization.
- Krewson, S. (2012), REIT Roadmap, Cedar Tree Books, LTD: Wilmington DE
- Newell., G. (2010), Listed Property Trusts in Australia, in *Global Trends in Real Estate Finance*, edited by Graeme Newell and Karen Sieracki, Wiley-Blackwell.

Ooi, J. and Har, N. P. (2010), Asian REITs: Playing the Yield Game, in *Global Trends in Real Estate Finance*, edited by Graeme Newell and Karen Sieracki, Wiley-Blackwell.

Ooi, J., Newell, G. and Sing, T, F. (2006), The Growth of REIT Markets in Asia, *Journal of Real Estate Literature*, 14, 2, 203-222.

Ott, S., Timothy, R., and Yi, H. C. (2005), Finance, Investment, and Investment Performance: Evidence from the REIT Sector, *Real Estate Economics*, Spring, 33, 1, 203-235.

Packer, F. and Riddiough, T. (2012), Securitization and the Commercial Property Cycle, in *Property Markets and Financial Stability*, Conference Volume, Reserve Bank of Australia.

Packer, F., Riddiough, T. and Shek, J. (2013), Securitization and the Supply Cycle: Evidence from the REIT Market, *The Journal of Portfolio Management*, 39, 5, 134-143.

Riddiough, T., Moriarty, M. and Yeatman, P.J. (2005), Privately versus Publicly Held Asset Investment Performance, *Real Estate Economics*, 33, 1, 121-146.

Sawada, K. (2008), J-REIT View: J-REIT Market at a Turning Point, Association for Real Estate Securitization.

Shimizu, C., and Nishimura, K. (2007), Pricing Structure in Tokyo Metropolitan Land markets and its Structural Changes: Pre-Bubble, Bubble and Post-Bubble Periods, *Journal of Property Finance and Economics*, 35, 4, 475-496.

Vandell, K. D. (1999), The Mortgage REITs: Dynamos or Duds, Unpublished Manuscript, University of Wisconsin.

Zhu, H. (2006), The Structure of Housing Finance Markets and House Prices in Asia, *BIS Quarterly Review*. 55-69.