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Money into Property: Keeping on Track in Asia Pacific Real Estate Capital Markets

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Abstract:

Owing to the increasing level of interest in the Asia-Pacific real estate capital markets, this paper makes the first attempt to quantify the size of real estate capital markets in the region. In terms of total commercial real estate stock and investment grade stock of selected Asia-Pacific markets, a top-down approach is applied. In terms of invested stock (real estate capital market), or the actual holdings of commercial real estate, it is possible to provide approximate figures for public and private equity holdings via a bottom-up approach. Estimates for the size of the real estate capital market will provide an indication of the potential for growth in the investment market in Asia-Pacific.

This paper examines eight real estate capital markets in Asia-Pacific countries. The total commercial real estate stock in this study was approximately USD 4.8 trillion, with US$ 2.1 trillion of investment grade stock. The size of the real estate capital market stood at US$ 1.5 trillion at the end of 2004. In addition, US$ 180 billion of capital has come into the real estate markets from 2003 to 2004.

Key Words: Real estate capital markets, Asia-Pacific countries, total stock, investible stock, invested stock.

1. Introduction

The commercial real estate market is difficult to measure. A number of previous studies have attempted to quantify the size of European and North American real estate stock by using indirect approaches, but the Asia-Pacific region has been largely omitted. Owing to the increasing level of interest in the Asia-Pacific real estate market, this paper makes the first attempt to estimate the value of total commercial real estate stock, investible stock and invested stock of Asia-Pacific markets.

With the growing real estate capital flows, Asia-Pacific has also experienced stronger growth in the past few years. Investment activities have not only taken place with inter-regional investors but also with international investors. This research also analyses the investment activities within the region. The main aim of this research is to improve the market transparency in the region for both the commercial and academic sectors.

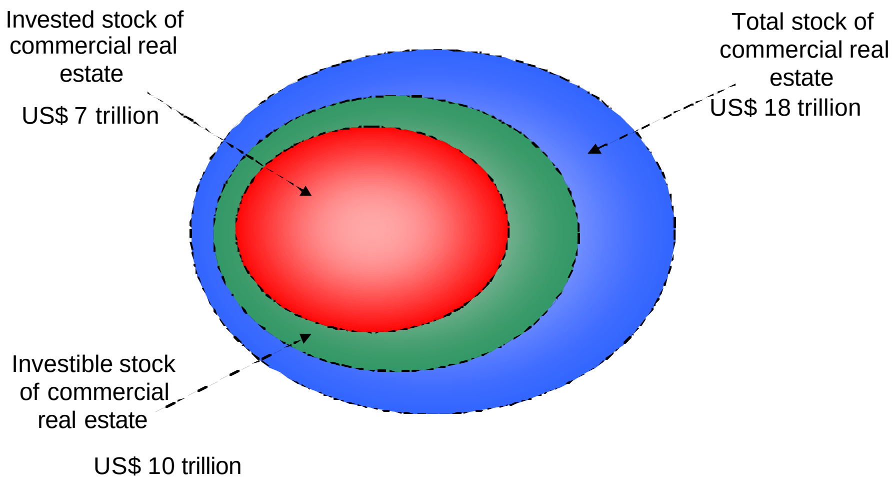
2. Asia Real Estate Market Dimension in Global Real Estate Context

Total Stock

There is no publication which has up to date information for the total stock in the Asia-Pacific region. DTZ Research has developed a top-down approach to estimate the total stock and investible stock. In terms of invested stock or the actual holdings of commercial real estate we are able to provide approximate figures for public and private equity holdings via a bottom-up approach. Estimates for total stock and investible stock will provide an indication of the potential for growth in the investment market in Asia-Pacific.

In 2005, Deutsche Bank Real Estate Research and DTZ Research estimate that there are around USD 18 trillion for global total stock; USD 10 trillion for global investible stock and USD 7 trillion for invested stock.

Global Commercial Real Estate Stock



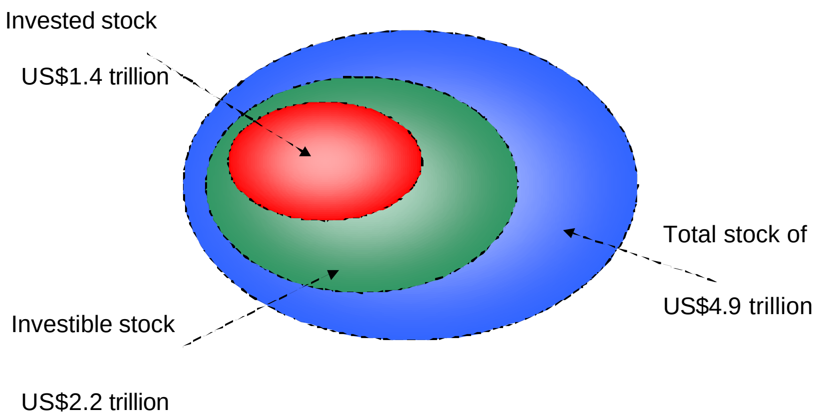
Source: RREEF/DB Real Estate Research, DTZ Research

In order to estimate the value of total stock, a starting point is to note that commercial real estate stock in every country should be highly correlated with GDP, since real estate is one of the major factors of production. Using this relationship, total commercial real estate stock for each country could be estimated, with reference to the USA (details see Appendix A).

The principal weakness of this approach is that it assumes that the real estate capital-output ratio is constant across all countries. Of course, the composition of GDP also varies somewhat across the 9 countries considered in this analysis. Therefore, to partially account for this, the formula (details see Appendix A) has been applied after removing the contribution of agriculture, forestry and fishing as well as mining and energy supply. Exchange rate fluctuations can also influence estimates of total stock; therefore, estimates of GDP at purchasing power parity exchange rates have been used in this analysis. In addition, most of the Asian currencies are pegged to the US dollar, which might eliminate the effect of the exchange rate. This approach is unlikely to result in significant errors for countries that are similar to the USA in terms of composition of output and productivity rates. However, for less developed economies the approach will tend to overestimate total stock to some extent.

The total stock of commercial property across the 9 selected countries was around USD 4.9 trillion by the end of 2004. Japan accounts for the majority (50% of the total stock) followed by China (30% of the total stock). Those two countries account for almost 80% of the total commercial stock among the 9 countries, because of the size of their non-farm GDPs. Australia, South Korea and Taiwan account for the next largest share of total commercial real estate stock, which stands at around USD 757 billion. Hong Kong, Singapore, Malaysia and Thailand are relatively small by comparison, accounting for 6% of the total. This is owing to the size of the economy in Hong Kong and Singapore, as well as the economic structure in Malaysia and Thailand.

Asia Pacific Commercial Real Estate Stock[1]



Source: RREEF/DB Real Estate Research, DTZ Research

[1] Asia Pacific figures only covers 9 selected countries: Australia, China, Hong Kong, Japan, Malaysia, Singapore, South Korea, Singapore, Taiwan and Thailand.

Investible Stock

The benchmark for investible stock is the USA, which has around USD 4.4 trillion. The investible stock estimate for each country is then adjusted by a measure of relative wealth as a proxy variable for development (GDP_A / P_A= GDP per capita). The formula implies that less developed countries such as China, Thailand and Malaysia would have a lower ratio of real estate value to GDP (details see Appendix A). The qualitative adjustment is also applied based on the ratio of investible stock to total stock; the ratio of investible stock to GDP and the economic condition of each country. Qualitative adjustments have been made in co-operation with local experts in Deutsche Bank and DTZ Asian offices.

The service sector comprises the largest component of economic growth in Singapore and Hong Kong. Both countries are city states and have the largest commercial real estate sector. Therefore a qualitative upward adjustment has applied for both markets. Malaysia and Thailand were known as Newly Industrial Economies (NIEs), and both economies experienced property booms in the 1990s. Although the property market experienced a serious downturn in 1998 and 1999, there has been a significant recovery in economic growth in recent years, with real estate markets believed to have progressed more than indicated by raw GDP figures. The following table shows the investible stock for the sample countries.

Investible commercial stock

Country	**Investible Stock** USD Billion	**Investible Stock to GDP Ratio**	**Investible Stock to Total Stock Ratio**
Australia	168.15	29%	70.00%
China	478.57	7%	19.82%
Hong Kong	75.98	39%	94.68%
Japan	1,138.38	32%	75.00%
Malaysia	33.44	13%	40.46%
Singapore	48.23	39%	93.61%
South Korea	157.32	25%	51.29%
Taiwan	103.40	18%	45.00%
Thailand	35.00	11%	30.74%
Total	**2238.47**		

Source: RREEF/DB Real Estate Research, DTZ Research

Looking at the ratio of investible stock to total stock, Hong Kong and Singapore have the highest ratio, because of the highly developed service sector and high density of the population in both cities. Around 70% of the total stock is investible stock in both Japan and Australia, which also show highly developed real estate markets. In China, only 1/5 of the total stock is investible. Most of this investible real estate is located on the east coast with the rest of the country dominated by sub-standard properties.

Invested Stock and Owner occupation ratios

In order to estimate the invested stock of commercial real estate in each country, real estate holdings of different investor groups have been aggregated.

Invested stock in Asia-Pacific stands at around USD 1.4 trillion at the end of 2004. As with investible stock, the invested stock was dominated by Japan which took around 62% of the Asia-Pacific investment market in 2004. Both China and Australia accounted for another 25% of the total invested stock. The rest of the countries are relatively small compared to those dominant economies in the region.

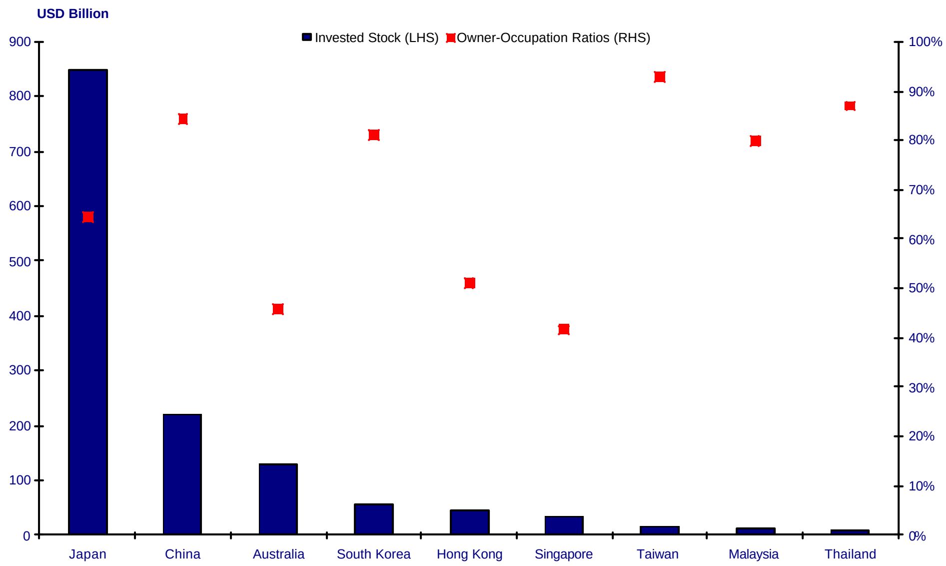
The implied owner-occupation ratios are simply non-invested stock as a share of total stock. The results of this approach should be treated as broadly indicative of the actual owner-occupation ratio given the potential for errors.

More developed investment markets would have a higher degree of investor participation; therefore, their owner-occupation ratios should be lower than those less mature investment markets where real estate investment activities are still in their infancy. .

Singapore, Japan, Hong Kong and Australia have the lowest rates of owner-occupation which reflect developed institutional and commercial lending sectors. The lowest owner-occupation ratio is attributed to Singapore followed by Australia, and Hong Kong. The common characteristics of those economies with the lowest owner-occupation ratios are: a highly developed service sector and an active institutional investment market.

On the other hand, China, Malaysia, Taiwan and Thailand have the highest rates of owner-occupation. This could also be explained by low rates of participation by key investors including quoted property companies, institutions (insurance and pension funds) as well as the lack of a developed local commercial lending sector and relatively poor institutional structure[2].

Invested Real Estate Stock and Implied Owner-occupation Ratios



Source: RREEF/DB Real Estate Research, DTZ Research

3. Asia Pacific Real Estate Capital Markets

In this part, a breakdown of the Asia-Pacific real estate investment market is presented in which consideration is given to the source of capital, namely public or private and debt or equity. The term 'public' refers to listed capital, i.e. debt or equity, which is quoted in securities markets. By implication 'private' capital refers to unlisted debt or equity. To be clear, private equity here is defined as investments held by all unlisted equity vehicles. This definition therefore includes pension funds, insurance companies, private property companies as well as unlisted indirect vehicles and, as such, is wider than the definition usually implied by this term.

[2] Chin H and Dent P (2005), An Analysis of the Level of Maturity in South-East Asian Property Markets, Pacific Rim Property Research Journal, 11(4), pp.355 - 372

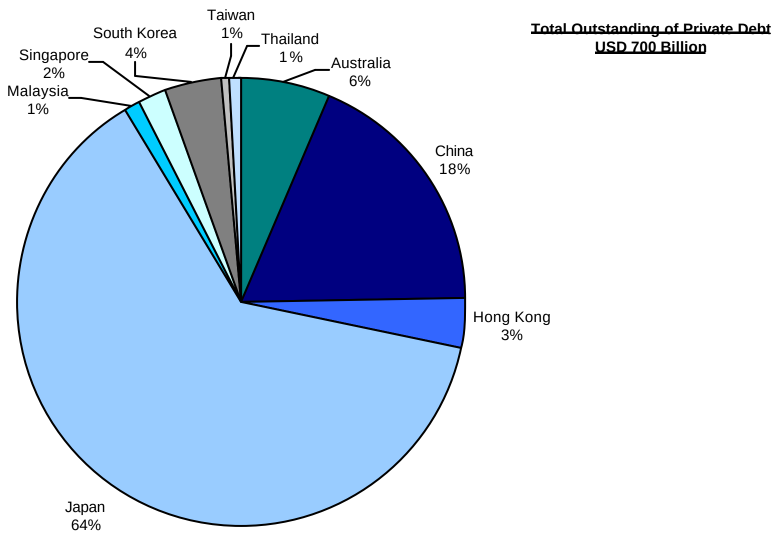
Private Debt:

In 2004 total outstanding private debt in Asia-Pacific stood at USD 673 billion across the eight countries included in this study. This represents around 40% of total invested stock across the region.

The most well developed private debt sectors are found in Japan, Australia Hong Kong and Singapore. Japan has the largest outstanding private debt (USD 444 billion) followed by China, South Korea and Australia. Malaysia, Thailand and Taiwan have relatively small amounts of private debt, with less than USD 10 billion. This can be explained by the size and immaturity of the commercial real estate markets in these countries.

Private debt has grown 10% between 2003 and 2004. Growth has been particularly strong in Japan, China and Australia. In Japan, low finance rates and an active real estate investment market have been the key reasons for the expansion. In China, private debt has grown fast in the past decade, because of the soft landing policy[3] and the fast growing commercial real estate market. Although, the Chinese government introduced a hard landing policy last year, the amount of outstanding private debt continued to grow steadily although a slow down in growth is anticipated. Hong Kong, Singapore, South Korea, Malaysia, Thailand and Taiwan have remained stable in their level of outstanding private debt over the last two years.

Private Debt: Outstanding of Commercial Bank lending by Country (2004)



Source: RREEF/DB Real Estate Research, DTZ Research

Public Debt:

The total value of public debt outstanding in 2004 net of called and matured securities stood at USD 81 billion.

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[3] Low lending rates and loose lending criteria for the property sector

The value of outstanding CMBS, excluding issues backed by residential property, stood at USD 41 billion in 2004, a USD 28 billion increase from 2003. This represents substantial growth of over 30% in a year. Outstanding property company corporate bonds were at just over USD 41 billion[4].

It is worth paying attention to the CMBS markets in Asia as there has been strong growth in the past 24 months together with the on-going REITs developments.

Japan's real estate market has had a strong capital inflow in recent years, owing to J-REITs and some private investment funds. The amount of outstanding CMBS reached USD 32 billion in 2004. Net CMBS issuance is expected to grow in 2006 owing to the active J-REITs.

CMBS markets are relatively new to Singapore and Taiwan. The Singaporean CMBS market began in 2002, the same year that REITs emerged there. In Singapore, the outstanding amount of CMBS stood at USD 2.31 billion. Retail and office buildings are the favourites for securitisation. Around 85% of the new issuance of CMBS in 2004 were issued by REITs[5]. This may be driven by the stable cash flows and sound financial management which characterises these vehicles. In Taiwan, the first CMBS deal was done in 2004. The total amount of CMBS in 2004 was USD 0.45 billion.

There has been no CMBS issuance in Hong Kong since 2000. The last CMBS issue in Hong Kong was in 1997 and the company (Sino & the Ng family) has since gone bankrupt. Owing to the lower fees and low cost of borrowing in recent years, most players and private funds have preferred to raise their capital through bank lending. With the rising interest rates and emergence of REITs in Hong Kong, we are expecting to see few CMBS deals in Hong Kong in the short term. There are also no CMBS in China and Thailand. This could be explained by the lack of structured financial instruments in the real estate sector; for example, there is no REIT structure in China.

Public Equity

Public equity holdings on a pure equity basis reached USD 71 billion in 2004 across the Asia-Pacific. Listed property company holdings (quoted property companies and REITs) represent at the aggregate Asia-Pacific level USD 68 billion with the rest made up of listed property vehicles, most notably the German open-ended funds.

Quoted property company growth over 2003 was around 26%, reaching USD 68 billion in 2004. Japan holds the largest share of assets of this type with over USD 28.9 billion in 2004 owing to its strong quoted property sector as well as a growing J-REITs market. Following Japan, Australia has the strongest quoted property sector, because of its well-structured LPT market.

Singapore and Hong Kong are in the next tier with USD 6.1 billion and USD 3.3 billion held by their quoted property sectors respectively. Traditionally, both countries have strong quoted property sectors. With the newly-emerged REITs market in Singapore, the quoted property sector has increased 7% from 2003. With 3 REITs[6] listed in Hong Kong in Nov 2005, the public

[4] Data are obtained from Deutsche Bank Research, Moodys and Standard & Poors
[5] Moodys (2005), International Structured Finance: Special Report
[6] The Link REIT which includes over 150 government-owned shopping centres and has a market cap of over HK$19 billion, is the world's largest IPO of a property trust. Two further REITs have been launched over recent months, including: 1) Prosperity REIT from Cheung Kong Holding (the IPO raised HK$1.92 billion and the share price increased 13.4% within the first week); 2)GZI REIT (this was the first REIT in Hong Kong to be focused on trading Mainland China property; the IPO raised HK$ 1.8 billion and the share price jumped 22% the first trading day). GZI REITs will be a benchmark for Chinese development companies seeking to raise capital through the HK REIT market.

equity holdings are expected to increase significantly in the next few years. With the emergence of the new REIT structure in South Korea, REIT holdings are also expected to increase in the medium term.

Taiwan, Malaysia, Thailand and China all have smaller quoted property sectors with a total of USD 3.2 billion. This is in part explained by the fact that quoted property companies in these countries are disproportionately active in the residential sector and commercial property companies tend to be relatively small.

The introduction and growth of the REIT structures increases liquidity in the market and, just as significantly, provides important platforms for investing in less mature countries notably China and India. Despite the increased liquidity in the market, the structure of real estate ownership and the dominance of a small number of highly powerful owners restricts the overall liquidity in the market

Private Equity

At the end of 2004, total private equity in Asia-Pacific stood at USD 527 billion. Of this the single largest investor group were private companies and individuals with an estimated USD 351 billion in real estate holdings across Asia-Pacific.

This can be proven by the results from the first DTZ Research Asia Pacific Investors Survey, which suggests private property companies are moderately active in Asia-Pacific real estate markets. 71% of them stated that they are currently engaged in cross-border real estate investment. Those which are not currently investing cross-border do show strong interest in cross-border investment for the medium term.

The holdings for pension funds also increased 20% to USD 74 billion. The average asset allocation of pension funds ranged from 0.2% in South Korea to 5% in Australia. Compared to Western Europe, the level of exposure to commercial real estate for pension funds is typically very low. With the poor performance in other asset classes and the aging population problem, many pension funds are looking to increase their allocation in real estate in the next 3 to 5 years. [7]

In general, commercial real estate is regarded as a riskier investment in Asia, thus, there are various restrictions[8] for insurance companies to invest in real estate. Even so, insurance companies made up USD 99.7 billion of private equity in 2004. There is a moderate growth (7%) in insurance funds holdings in commercial real estate from 2003.

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[7] There are no commercial real estate holdings for pension funds in China, Hong Kong, Singapore and Taiwan. Pension funds in these countries are not permitted to invest in commercial real estate. Traditionally, commercial real estate is not regarded as a financial asset and commercial real estate investment is also considered to carry higher risk with low-liquidity.

[8] In Japan, real estate holding for insurance companies could not exceed 20%. In Singapore, there are no restrictions for insurance companies on holding real estate in Singapore. However, real estate carries a "concentration risk limit" of 35% of the fund's value. Any insurance company with real estate holdings exceeding this limit is subject to a charge. In Taiwan, the cap on commercial real is 30% of total assets. In Hong Kong, there is no limit for the amount of real estate which can be held by an insurance company. However, the Office of the Commissioner of Insurance in Hong Kong states that they evaluate a company's asset-liability ratios using a weighting for each asset category. The more liquid the asset is, the higher the weighting. Real estate has a low weighting under their valuation guidance. In effect, this has limited the value of real estate held by insurance companies in Hong Kong.

4. Asia Pacific Real Estate Capital Markets

Investors seeking exposure to Asia-Pacific real estate can obtain this in three ways

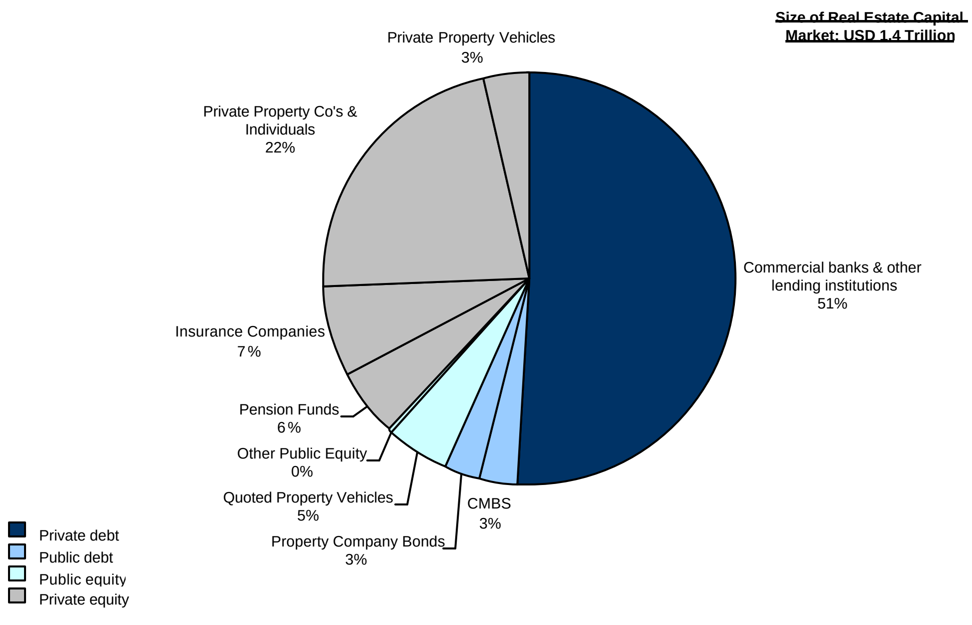
- Direct acquisition of physical property assets from the invested stock;
- Acquiring publicly traded securities, such as real estate equities, property company corporate bonds or commercial mortgage backed securities; or
- Investing in property assets indirectly via either a listed or unlisted vehicle.

Simply aggregating the direct real estate holdings of the investor groups, the Asian Pacific real estate market has been split into quadrants: private debt, public debt, public equity and private equity

The total size of the real estate capital market in Asia Pacific stood at USD 1.4 trillion. Commercial lending accounts for 51% of the total. Private debt has outperformed public debt market, demonstrating the level of the market maturity.

Equity represented USD 598 billion of the overall market. Private equity significantly overshadowed public equity. Within private equity, private property companies, individuals and private vehicles dominated representing 25% of the overall capital markets.

<u>Asia-Pacific Commercial Real Estate Capital Market</u>



Source: RREEF/DB Real Estate Research, DTZ Research

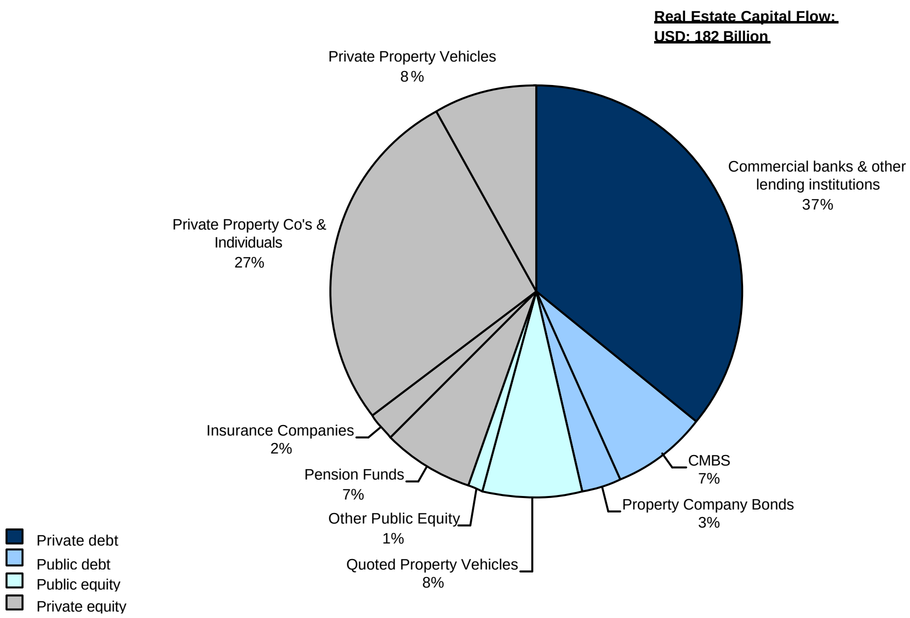
5. Asia Pacific Real Estate Capital Flow

Official data on net investment by the various investor groups is not available. Therefore, it is estimated from stock data using the methodology discussed in Appendix A. Investors committed around USD 182 billion in additional capital. Investment on the private equity side came primarily from private property companies and individuals which, added USD 50 billion in additional capital. Strong growth in private equity was driven by pension funds and other private vehicles.

However, overall the market was driven by private debt. Commercial banks lent an additional USD 65 billion. Owing to a lack of alternatives commercial bank lending seems to be the most efficient method of raising capital in Asia Pacific emerging markets.

Public equity also added 8% to the size of the capital market in 2004, due in large part to investment from REITs. On the public debt side, considerable growth was seen from CMBS which added USD13 billion. Relatively speaking, corporate bonds grew more modestly with only USD 5 billion in incremental growth

Asia-Pacific Commercial Real Estate Capital Flows (2003 to 2004)



Source: RREEF/DB Real Estate Research, DTZ Research

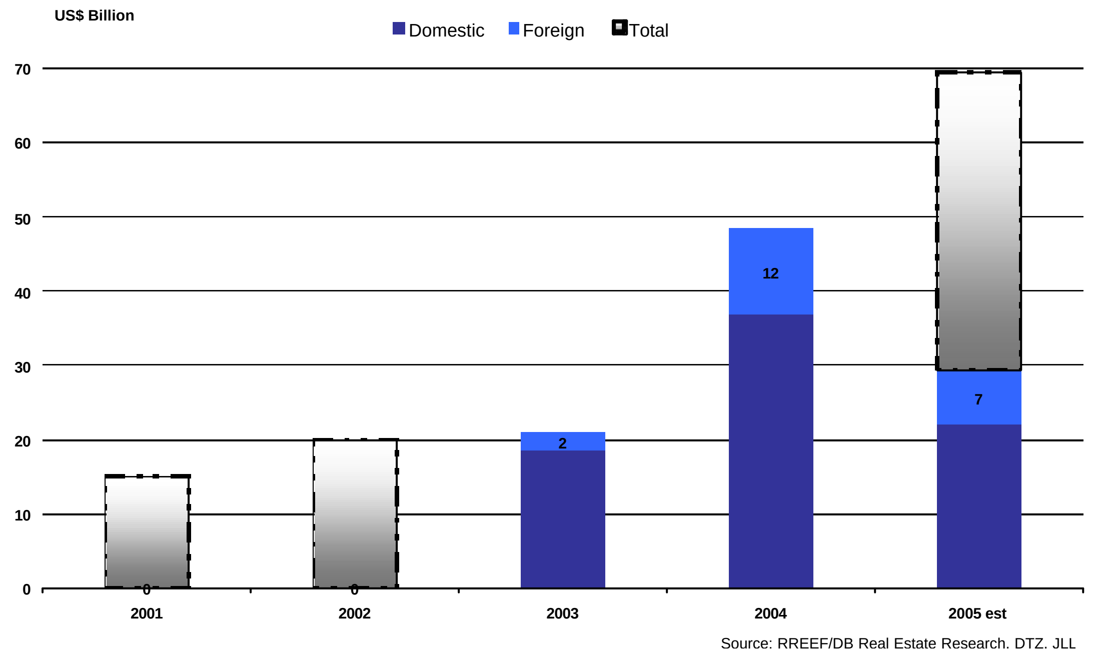
6. Asia Pacific Real Estate Investment Activities

Transparency is a major issue for many Asia Pacific property markets. This section will draw some key points for Asia Pacific real estate investment activities.

Because of the fast growing interest in cross-border investment, the Asia Pacific region has been in those investors' radar since 2002. The amount of the total transactions has increased from

USD 15 billion in 2001 to USD 70 billion in 2005[9]. As to cross-border investment, it also increased from USD 2 billion in 2003 to USD 7 billion in the first half of 2005. This trend seems to be continuing in the short to medium terms considering the amount of the capital going into real estate globally.

Asia-Pacific Real Estate Investment Activities from 2001 to 2005

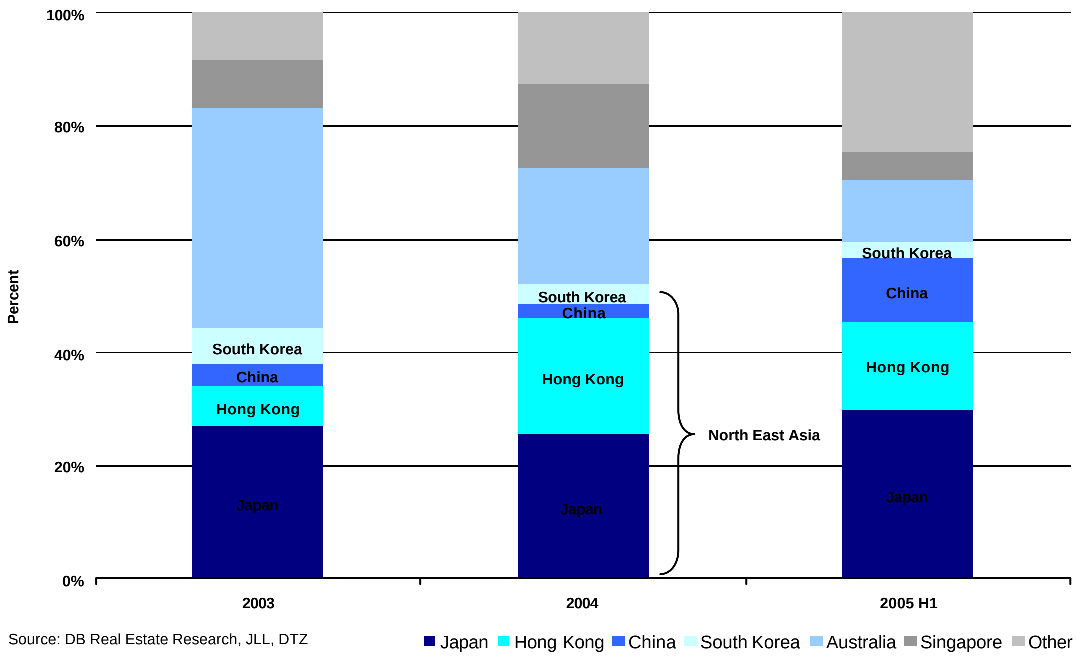


The following chart shows the investment activities across the region. Australia has decreased its share from nearly 40% of the total transaction activities in to just over 10% in the first half of 2005. It shows that the market transparency has improved across the region. North-East Asia took up around 60% of the investment activities in the whole region and the trend is likely to continue considering the amount of the capital flow into the market and the compression of the cap rates.

Owing to the lack of suitable product, low level of transparency and the lack of a diverse range of investment vehicles in many Southeast Asian countries, such as Thailand and Malaysia, the amount of the investment activities are relatively low[10].

[9] Estimated figures.
[10] Liquidity ratio is around 3% in Thailand and 4% in Malaysia.

<u>**Real Estate Purchasing Activities by Country**</u>



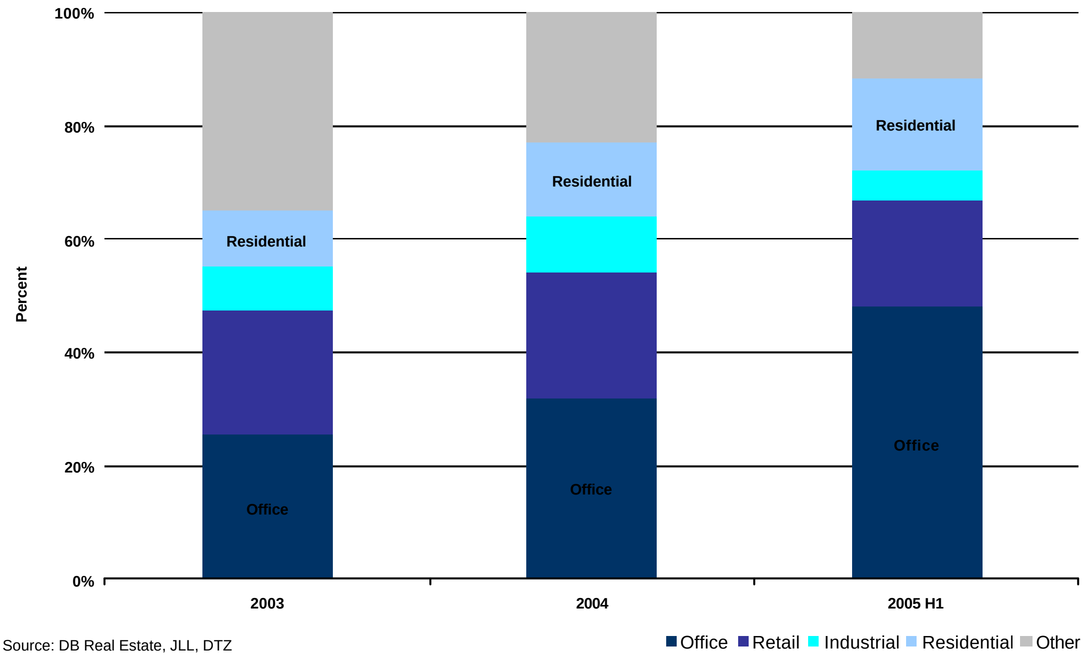
Source: DB Real Estate Research, JLL, DTZ

Office still is the most favoured sector of all investment whether domestic or cross-border. This could be explained by the fact that the office sector is believed to be the most liquid commercial sector in Asia.

Rapid service sector growth and increased household income has also contributed to the interest in office properties and retail. Both sectors have accounted for 90% of the cross-border investment activities. This scenario is also confirmed by DTZ's Asia Investor's Survey.

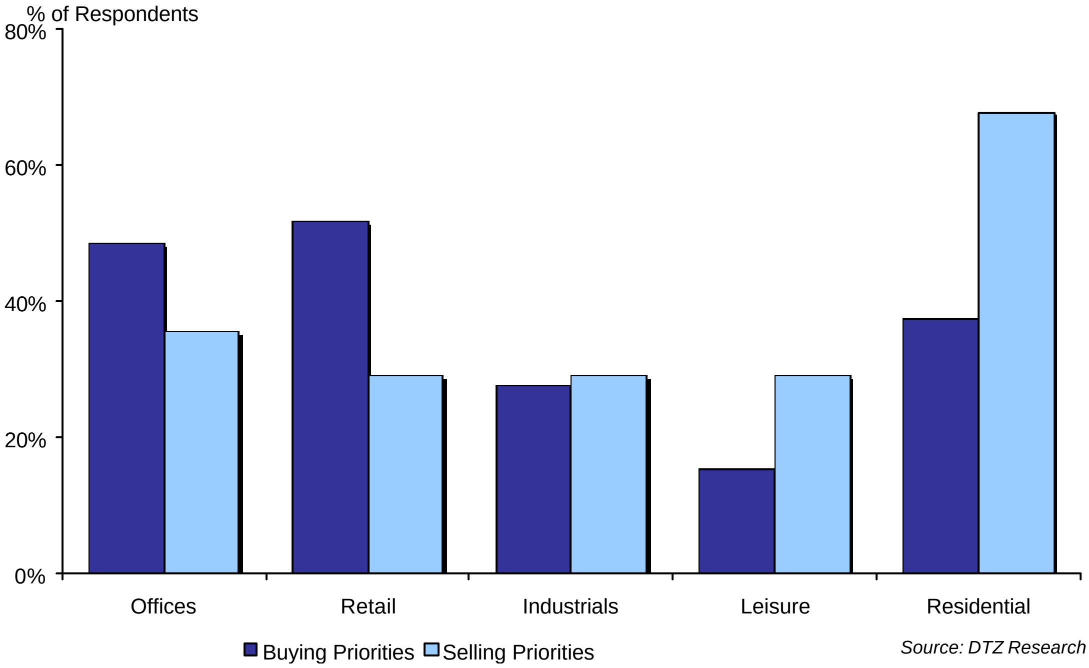
Interestingly, the share of the residential sector also increases from 10% in 2003 to 20% in 2005 H1, especially in China, owing to the increase of the middle-income group and the fast immigration to east coast cities in China. The demand for modern housing has increased drastically in the past 5 years.

Real Estate Purchasing Activities by Sector



Source: DB Real Estate, JLL, DTZ

Cross-border Buying and Selling Priorities Sectors over the Next 12 Months



Source: DTZ Research

According to DTZ Research, the majority of purchases were made with private capital (around 60%), but there are still considerable amounts of un-identified sources of capital, owing to the lack of market transparency and a business culture characterised by an unwillingness to share information. DB Real Estate Research and DTZ Research believe the amount of the private capital could reach around 70% to 80% of all transactions.

7. Conclusion

Although, China has introduced the hard landing policy, the demand for private debt finance at the Asia-Pacific level is expected to remain strong. Lending activity is still driven primarily by domestic investment.

With the growing REIT markets in Hong Kong, Japan, Singapore, Taiwan and Malaysia, the outlook for these quoted vehicles is very positive.

Purchasing activity within the Asia-Pacific commercial real estate market is expected to remain strong in 2006 because many institutions and private property vehicles are looking to increase their cross-border real estate holdings. Key sources for new investment are likely to be Singapore, Hong Kong, Australia, the US and Germany.

Indeed, results from DTZ Research's survey of Asia-Pacific real estate investors suggest that almost 40% are seeking to increase purchases of cross-border real estate in 2006 and 2007. Only 25% of our respondents did not invest in cross-border real estate in Asia.

In terms of non-domestic real estate purchasing priorities in 2006, China was the most favoured location, followed by Australia, Japan, South Korea and Hong Kong.

On a sector basis investors indicated they still favour the office and retail sectors for the next 12 months. Whilst cross-border demand continues to be strong from a number of nationalities and investor groups, competition for good quality stock is expected to put further downward pressure on yields in a number of markets such as Seoul, Shanghai, and Tokyo.

Appendix 1

Total Stock

The total stock of commercial property is estimated using the following formula:

$TS_A = TS_{USA} * GDP_A / GDP_{USA}$

Where TS_A refers to total stock in country A and GDP_A is the non-agricultural GDP for country A. GDP_A is measured at purchasing power parity exchange rates and is defined as total GDP less output from agriculture, forestry and fishing as well as mining and energy supply. The source for this data is the International Monetary Fund World Economic Outlook Database and Asian Development Bank.

Investible Stock

The starting point involves assuming that the USA investment market could, over time, evolve in such a way that the proportion of total stock in the investment market is similar to that currently reported in the US (approximately 70%). The USA estimate (70% of total stock) is then used as a benchmark for estimating investible stock for other countries. For each country, the estimate is adjusted first by the ratio of that country's non-agricultural GDP at PPP exchange rates to the USA's (as was the case with total stock) and second by a measure of relative wealth (GDP per capita) as a proxy for development. Therefore less (more) developed countries should have a lower (higher) ratio of real estate value to GDP. In other words, investible stock is estimated using the following formula:

$IS_A = IS_{USA} * GDP_A / GDP_{USA} * (GDP_A / P_A) / (GDP_{USA} / P_{USA})^{1/3}$ [11]

Where IS_A refers to investible stock in country A and P_A is the population in country A. The source for the GDP per capita data is the International Monetary Fund World Economic Outlook Database.

In principal, this formula was developed for the DTZ Money into Property series (UK, Europe, USA and Asia). It might not be able to apply in every single market and, on various occasions, qualitative adjustments are essential to reflect the real figures on investible stock.

Invested Stock

In order to estimate the invested stock of commercial property in each country, the real estate holdings of different investor groups have been aggregated.

Private Debt

Private debt refers to all real estate debt that is not held in the form of listed financial securities. Loans granted and subsequently securitised prior to maturity are not included in this data. Instead the value of the debt outstanding in this form (i.e. commercial mortgage backed securities) is classified as public debt. Private debt data has been compiled largely from individual National Statistics agencies or Central Bank of each country. This, of course, raises the possibility of inconsistencies in definitions across countries. The aim was, where possible, to obtain data on the volume of debt outstanding commercial real estate. If not, the data on the volume of debt outstanding to real estate will be used.

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[11] Pramerica Real Estate Investors (2003), A Bird Eye of Real Estate Markets, March, USA
Pramerica Real Estate Investors (1999), Global Commercial Real Estate, March, April, USA

The data source for each country are:

Australia: Australian Prudential Regulation Authority
China: People's Bank of China [12]
Hong Kong: Hong Kong Monetary Authority
Japan: Bank of Japan
Malaysia: Central Bank of Malaysia (Bank Negera Malaysia)
Singapore: Monetary Authority of Singapore (MAS)[13]
Taiwan: Central Bank of Taiwan (Central Bank of China)
Thailand: Bank of Thailand [14]

Public Debt

Public debt refers to real estate debt held in the form of listed financial securities, i.e. property company corporate bonds and commercial mortgage backed securities (CMBS). Data on the value of debt outstanding in the form of corporate bonds was obtained from Bloomberg. Data on CMBS issuance has been obtained from rating agencies Standard & Poors and Moodys as well as Deutsche Bank Research.

Public Equity

Public equity refers the commercial real estate holdings for listed property companies as well as REIT/LPT companies. The consolidated holdings of the **quoted real estate companies** in each Asian Pacific market has been obtained from Bloomberg. In terms of other public equity, German Open-ended fund is the other capital that we recorded and it was obtained from PMI.

Private Equity

Private equity refers to the commercial real estate holdings by insurance companies, pension funds and other private investors and vehicles.

Information regarding the real estate weighting and holdings of **life and non-life insurance companies** are stated below:

Australia: OECD and APRA.
China: China Insurance Regulatory Commission[15]
Hong Kong: Commission for Census and Statistics
Japan: Bank of Japan
Malaysia: Central bank of Malaysia
Singapore: Monetary Authority of Singapore (MAS)
Taiwan: Central Bank of Taiwan
Thailand: Department of Insurance (DOI)

Information on real estate holdings of **pension funds** are obtained from the following sources:

Australia: APRA (Superannuation fund)
China: People's Bank of China/National Statistics[16]
Hong Kong: Hong Kong Monetary Authority
Japan: Japanese Ministry of Health, Labour and Welfare and Bank of Japan[17]

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[12] estimated figures
[13] construction and property sector
[14] official data is only available till 2003. The data for 2004 is estimated
[15] Chinese insurance companies are not allowed to invest in commercial real estate
[16] Chinese pension funds are not allowed to invest in real estate
[17] Estimated figures (2% of the total assets)

Malaysia: Employees Provident Fund
Singapore: Singapore Central Provident Fund Board
Taiwan: Central Bank of Taiwan
Thailand: Central Bank/National Statistics (Government Pension Fund)

Estimates of real estate held by private individuals and private property companies are derived from the residual of outstanding debt from public equities, insurance companies and institutions. This residual is the remaining debt after allocating total outstanding debt to the various investor groups. The residual is attributed to private individuals and private property companies.