THE SIGNIFICANCE AND PERFORMANCE OF THE HONG KONG COMMERCIAL REAL ESTATE MARKET

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ABSTRACT

The Hong Kong commercial real estate market is an important investment opportunity for both local and institutional investors. The purpose of this paper is to assess the significance, risk-adjusted performance and portfolio diversification benefits of Hong Kong commercial real estate (using both direct real estate and REITs) in a mixed-asset portfolio over 2009-2018. Using MSCI annual real estate returns, the risk-adjusted performance and portfolio diversification benefits of Hong Kong commercial real estate over 2009-2018 are assessed. The results highlight a unique investment opportunity of Hong Kong commercial real estate, with both direct real estate and REITs deliver superior risk-adjusted performance compared to the stock market. Direct property also offers high diversification benefits to investors with their marginally correlated returns with stocks, while excellent diversification benefits with bonds are evident for REITs. The superior risk-adjusted performance of Hong Kong commercial property sees both direct property and REITs contributing significantly to the mixed-asset portfolio throughout the entire risk-return spectrum. The strategic real estate investment implications are also highlighted.

Keywords: Hong Kong, commercial real estate, REITs, risk-adjusted returns, portfolio diversification

INTRODUCTION

The property market of Hong Kong plays an essential role in Hong Kong's prosperity and the impact of any major changes or disruption to this market will spill over into other sectors affecting the whole economy. A lot of previous research has examined the significance of Hong Kong property market to its economy and the impact of real estate to portfolio returns, and much of these have focused on the analysis of the direct and indirect property markets, including Newell and Chau (1996). Chau et al (2003) applied return-based style analysis to analyze the investment styles and performance of property companies and the results showed that the performance of a property company was mainly attributable to its investment style characterized by the implied portfolio rather than management skills. Quan and Titman (1997) studied the relation between stock returns and changes in property values and rents based on data from 17 countries and the results found that there were no such relation in the United States, but significant relations were found in a number of countries.

In recent years, real estate performance analysis and the significant of real estate in portfolio diversification benefits have attracted considerable research interest. Newell, Wu, Chau and Wong (2010) assessed the HK-REITs market in Hong Kong over 2005-2008 and found that HK-REITs have shown strong risk-adjusted performance relative to Hong Kong shares and property companies over the period of 2005-2008, and the superior risk-adjusted performance was further enhanced during the GFC, but some loss of diversification benefits was also evident in the GFC. Newell, et al (2013) examined the French REITs market and the results showed that French REITs offered limited portfolio diversification benefits with stocks and more portfolio diversification benefits with bonds over 2003-2012. Newell and Mazuki (2016) studied the significance and performance of UK REITs market and found that the UK-REITs delivered strong risk-adjusted returns since the Global Financial Crisis (GFC), but with limited portfolio diversification benefits with UK stocks. Marzuki and Newell (2017) studied the US commercial real estate market and found that direct property gave the best risk-adjusted returns with improved diversification benefits in the post GFC –period, thus, US direct property exhibited a much stronger role than that of US-REITs in the post –GFC mixed asset portfolio. Newell and Mazuki (2018a and 2018b) assessed the significance, risk-adjusted performance and portfolio diversification benefits of property companies on the UK Alternative Investment Market (AIM) stock market over 2005-2015, and the German REITs market. Marzuki (2018) applied the same risk-adjusted returns analysis to the South Africa real estate market and evaluated the portfolio diversification benefits of commercial real estate in South Africa in a mixed-asset portfolio over the 1996-2016 period.

The purpose of this paper is to assess the significance, risk-adjusted performance and portfolio diversification benefits of Hong Kong commercial real estate (using both direct property and REITs) in a mixed-asset portfolio over 2009-2018. Two specific research questions (RQ) concerning Hong Kong commercial real estate are the primary focus of this research:

- RQ1: How does Hong Kong commercial real estate compare to major asset classes on a risk-adjusted basis?
- RQ2: Does Hong Kong commercial real estate provide added value and diversification in a mixed-asset portfolio framework?

These two research questions enable considerable insights into the role of Hong Kong commercial real estate in a mixed-asset portfolio, and the ongoing strategic implications for it as an effective real estate investment market, particularly for domestic real estate players and cross-border investors looking for optimistic risk-return real estate investment opportunities in a developed market. The strategic real estate investment implications are also highlighted.

Significance of Hong Kong Commercial Property

Hong Kong is a major international financial centre with a mature investment market and providing an economic gateway to the expanding investment opportunities in China. The stature of Hong Kong economy is further reinforced by the city's top ranking (No. 3) of the Global Financial Centres Index (ZYG, 2019) after New York (No. 1) and London (No. 2). With the GDP worth at 363 billion in 2018, and GDP (PPP) per capita now exceeding that of the US, Netherlands, Iceland, Germany and Australia (IMF, 2018), representing approximately 0.59 percent of the world economy, the economic prosperity has seen Hong Kong consistently ranked highly amongst the most competitive economies in the world. Being listed in the top -20 least corrupt countries (14th) (TI, 2019), Hong Kong is also the 7th most competitive market globally, exceeded by the USA (first place), Singapore (second place), Germany (third place), Switzerland (fourth place), japan (fifth place) and Netherlands (sixth place) (WEF, 2018). The Hong Kong economy registered GDP growth of 3 per cent (real) for the whole of 2018, and is expected to grow at around 2 per cent for 2019 amid an expected contraction in private consumption and fixed investment.

Hong Kong property market is an important investment alternative for investors at large. For some adventurous investors and older people with ability to buy, real estate is often an investment of choice. Both residential and commercial properties have come into focus as a potentially rewarding source of income and capital growth. In Hong Kong, real estate is a big part of personal and household wealth, given that real estate value has risen significantly since the global financial crisis (GFC) (Savills, 2019). The income-generating capability of real estate makes it attractive when compared to the interest rates available from most bonds or deposit accounts. Hong Kong has retained its title as the most expensive city in the world in which to buy a home (Demographia, 2018) and the most expensive market to rent (Knight Frank, 2019).

Comparing to the Global universe of commercial real estate (CRE) markets (USD 30.2 trillion, EPRA 2018), the size of investable property market in Hong Kong is very small (accounting for 1% of global CRE universe). The value of its commercial real estate is 7 percent of Asia Pacific's investable property at USD 307 billion, Hong Kong ranks number four in the Asia Pacific region after Japan (USD2,213 billion), South Korea (USD695 billion) and Australia (USD612 billion) among the developed markets (EPRA, 2018). Moreover, Hong Kong enjoys a high level of attention from global investors with its business-friendly environment, as it is reign the top of the Best Countries for Business 2019 among Asian countries and behind the UK (first place) and Sweden (second place) (Forbes, 2018) scoring well on trade freedom and the infrastructure. Although Hong Kong is the second most transparent real estate market in Asia, exceeded by Singapore, in terms of global transparency, Hong Kong (ranks 49th after Singapore at the Global Ranking) still need to progress faster and catch up with the highly transparent markets in the UK, Australia, and the US (the top three highly transparent markets globally, JLL, 2018) in order to maintain its competitiveness and status.

A key factor contributing to the attractiveness of Hong Kong's commercial real estate to both local and international real estate investors is the mature market and high liquidity of the property market resulting from short leases, low agent fees, no CGT, low tax rates, and readily available real estate sales data (Newell, Chau, Wong and McKinnell, 2007). However it is severely competitive for investors to source assets due to the low yield environment as strong demand and limited supply impacted. Hong Kong's property markets have seen a remarkable period of growth since 2009 after the GFC driven by an array of positive drivers both domestic and foreign including quantitative measures resulted in abundant liquidity and extremely low interest rates. Hong Kong's commercial real estate transactions of US$ 22.23 billion in 2010 represented an astounding 120% recovery from 2009 volume and exceeded the volume recorded at the peak in 2007 (US$16.0bn) the pre-crisis level. In Asia Pacific context, Hong Kong commercial real estate transactions over 2009 -2018 amounted to US$277.29 billion, accounting for about 5.06% of total Asia Pacific transactions over this ten-year period and compares with China (4,012 bn; first; 73.19%), Japan (382bn; second; 6.96%), Australia (305 bn; third; 5.57%) and South Korea (146bn; fifth; 2.66%) (Cushman & Wakefield; RCA; 2011-2019).

In 2018, Hong Kong accounted for $50.93 billion in transactions (RCA, 2019) and remained as the most-sought-after city destination for international capital among the core markets in Asia Pacific including Seoul, Singapore, Sydney and Tokyo. From Table 1, it is noteworthy to see that the property transaction landscape both in Hong Kong and Asia Pacific slowed in 2007-2008 after the GFC, rebound was seen in 2008-2009 and with full recovery in 2009-2010, and transaction volume growth remained positive in the subsequent years in general despite declines seen in 2012-2013 and 2013-2014 due to slower growth in China and debt burden rises affecting the trade-dependent market of Hong Kong. Traditional real estate sectors dominate the Hong Kong real estate acquisition landscape in 2009-2018, with the office sector dominating the volume (average 55% of total transaction volume). Under the yield-starved environment in Hong Kong, there was increased demand for industrial assets in recent years due to government's revitalization scheme and strong leasing demand for logistics and data centres in a new technology era with the promise of E-commerce linked gains. Growth in the retail and hotel investment sectors was documented across Asia Pacific in 2017 driven by some portfolio transactions and mega single-asset deals as rising tourism and better economic conditions boosted operator performance. However, volume was down significantly in 2018 due to significant decline in China and Hong Kong with a slower economic growth and the ongoing US-China trade conflict. In recent years, Hong Kong property funds were the largest contributors of commercial real estate transactions seeking value-added property investments. Although capital inflow by Chinese investors fell to the lowest volume quarterly since Q3 2015, Chinese developers with offshore capital retain a keen interest in Hong Kong property and development sites.

Table 1 Change in commercial real estate transactions: Global vs Asia Pacific vs Hong Kong: 2007-2018

Period	Global US$(%)	Asia Pacific US$(%)	Hong Kong US$(%)
2007-2008	-56%	-44%	-47%
2008-2009	-27%	59%	19%
2009-2010	89%	56%	119%
2010-2011	20%	5%	4%
2011-2012	9%	20%	17%
2012-2013	35%	62%	-8%
2013-2014	2%	-18%	-15%
2014-2015	7%	-9%	17%
2015-2016	2%	13%	15%
2016-2017	16%	36%	53%
2017-2018	4%	6%	16%

Source: Authors' own calculation from Cushman & Wakefield Global Investment Atlas Annual Report from RCA data

Development of Hong Kong REITs (HK-REITs)

In the last decade, the current low interest rates and the volatile stock market after the GFC have turned investors' interest to the Asian real estate markets as an alternative source of investment. The REIT market's flourish in Asia Pacific since 2000 have spurred the development of REITs in Hong Kong (ex-Australia, REITs in Australia known as Limited Property Trusts, LPTs have been in existence since 1970s), with Japan led the way in 2001 followed by Singapore in 2002, Thailand (2003), South Korea (2004), Taiwan, Malaysia and Hong Kong in 2005 (Newell, et al 2010). The legal framework for HK-REITs was established in 2003 when the Hong Kong Securities and Futures Commission (SFC) announced the Hong Kong Code on REITs (the Code) to the public. The HK-REITs market developed slowly from initially three REITs to ten REITs in December 2018, with the initial catalyst being the privatization of the large portfolio of Housing Authority's 151 shopping malls and 178 parking lots located in Hong Kong's public housing estates at US$ 2.86 billion that resulted in the listing of The Link REIT in 2005. The slow growth of HK-REITs market was mainly due to the strict regulatory code which dampen attractiveness for sponsors and investors.

Table 2 lists the full details of the current regulatory structure and characteristics of HK-REITs under the Code. The REIT code was revised the first time in 2005 to allow REITs and to invest in properties outside Hong Kong, and to lift the borrowing limit for a REIT from 35 per cent to 45 per cent of gross asset value, which allowed for more flexibility in managing a REIT's asset base and its balance sheet. The second relaxation came in September 2014, allowing REITs to invest up to 10 per cent of their asset value in property development to stimulate the HK-REITs market by removing barriers and increase its attractiveness. However, with all other REITs markets in Asia being tax transparent, this lack of tax advantages by HK-REITs has undermined the attractiveness and the pace of development of HK-REITs market.

Table 2 HK-REITs Legislation

Structure	Unit Trust
Management structure	Both external and internal manager allowed
% invested in real estate	100% ; held for at least two years
Geographical restrictions	No
Property development	Prohibited, but H-REIT may acquire uncompleted units comprising less than 10% NAV
Distribution	> 90% of taxable income
Capital gains tax	No
Withholding tax	No
Tax transparency	No
Leverage	Capped at 45% of gross asset value
Regulation	Hong Kong Code on REITs under the Hong Kong Securities and Futures Commission (SFC)
Listing	Hong Kong Stock Exchange

Source: Author's compilation from APREA (2014), EY (2016) and SFC (2017)

Table 3 provides the general profile of the ten REITs available in the listed real estate investment space in Hong Kong and their establishment timeline, property sectors and location. Over the past fifteen years, HK-REITs sector has grown into a more meaningful niche segment of the global REIT market, with a combined market capitalization of over US$ 35 billion (Daiwa 2019). Being the largest REIT in Hong Kong (by market capitalization), Link REIT has become the second-largest listed retail REIT in the world. Link REIT was actively enhancing its real estate portfolio by strategically disposing some of the suburban retail malls in Hong Kong and investing in value-added assets in Hong Kong and China.

Table 3 **Property Profile of Hong Kong REITs: 2019**

Hong Kong REITs	Year of IPO	Market Cap (US$ billion)	No. of Properties	Property Sector	Location
Champion REIT	2006	4.033	3	Office and retail	Hong Kong
Fortune REIT	2010	2.414	16	Retail, carparks	Hong Kong
Hui Xian REIT	2011	2.646	5	Office, retail, carparks, hotel and serviced apartments	China
Link REIT	2005	25.229	138	Retail, markets, carparks and office	Hong Kong, China
New Century REIT	2013	0.191	6	Hotel	China
Prosperity REIT	2005	0.598	7	Office and industrial	Hong Kong
Regal REIT	2007	0.876	9	Hotel and serviced apartments	Hong Kong
Spring REIT	2013	0.541	86	Offie, retail and carparks	China and UK
Sunlight REIT	2006	1.158	16	Office and retail	Hong Kong
Yuexiu REIT	2005	2.092	8	Office, retail, hotel and serviced apartments	China
Notes: The source is author's compilation from various Hong Kong REIT annual reports, and from Hong Kong Stock Exchange, Daiwa Capital Markets					
Data as at 2 September 2019, Hong Kong Stock Exchange					

Overall, the HK-REITs market not only provide investor choice regarding their listed property exposure and assessing investment properties in both the Hong Kong and China property markets, the HK-REITs market is getting an increasing recognition of its investment attractiveness, offering respectable yields, solid asset backing, and exposure to the robust Hong Kong and China commercial-property markets. This takes on even more investment appeal, given that a strong China REIT code is soon to come out. The subsequent sections of this paper will assess the risk-adjusted performance and portfolio diversification benefits of HK-REITs and direct property in a portfolio over 2009-2018.

DATA AND METHODOLOGY

Data sources

The MSCI annual returns series for Hong Kong direct property, HK-REITs, stocks and bonds were assessed over the period of 2008 to 2018. Due to the limitations of the data available, the ten years' time series data may not be able to cover a full real estate market cycle. The direct property series was represented by the MSCI property index (MSCI) direct property total return series. At Q4: 2018, there were 215 properties with a market value of US$ 710.7 billion in the MSCI. As the series is constructed from the appraisal value of individual property assets, this series was adjusted for valuation smoothing (as per Geltner (1993)) with a de-smoothing parameter of $\alpha = 0.50$. The resulting timeframe for the full period analysis was effectively Q4: 2009 – Q4: 2018. The HK-REITs index used was sourced from HKREITs total return series (composite and various subsector indices). In December 2018, the HKREITs database contained 10 REITs, corresponding to a market capitalization of US$40 billion. Equivalent asset class series for stocks and bonds were proxied to the Hang Seng Index, and Hong Kong ten-year government bonds index.

Methodology

Performance analysis included average annual returns and annual risks over 2009-2018 were assessed. Risk-adjusted returns were assessed using Sharpe ratio. Portfolio diversification benefits were assessed using correlation analysis to identify the potential mixed-asset portfolio benefits for commercial real estate in Hong Kong. The mixed –asset portfolios were assessed using efficient frontier and asset allocation diagrams across the risk spectrum.

Results: full period: 2009 – 2018

In the first subsection, I analyze the performance of commercial real estate in Hong Kong over the full period of 2009-2018.

Risk-adjusted performance

Table 4 displays the risk-adjusted performance of commercial real estate in Hong Kong over 2009-2018. REITs (24.01% p.a.) delivered the highest average returns, with direct property (13.98% p.a.) outperforming both stocks (12.33% p.a.) and bonds (1.82% p.a.). Except for bonds (0.41% p.a.), direct property (6.03% p.a.) recorded a lower risk level than REITs (20.86% p.a.) and stocks (23.04% p.a.). Except for bonds (Sharpe ratio: 4.42; Sharpe ranking #1), the strong performance demonstrated by both direct property (Sharpe ratio: 2.32; Sharpe ranking #2) and REITs (1.15; #3) indicate that these real estate investments channels are the best and second best performing assets compared to stocks (0.54; #4) using Sharpe ratio risk-adjusted performance ranking.

By real estate sub-sector, retail (2.32) was the best-performing sector, well ahead of office (1.50) and hotel (1.43).

Table 4 Hong Kong Commercial Real Estate Risk-adjusted Performance Analysis: 2009-2018

Asset	Average Annual Returns (%)	Annual Risk (%)	Sharpe Ratio
Direct Property	13.98%	6.03%	2.32
Office	11.15%	7.43%	1.50
Retail	18.55%	8.00%	2.32
Hotel	8.61%	6.01%	1.43
REITs	24.01%	20.86%	1.15
Stocks	12.33%	23.04%	0.54
Bonds	1.82%	0.41%	4.42

Notes: The source is author's analysis from MSCI.

Diversification benefits

The inter-asset correlation coefficients for Hong Kong commercial real estate over 2009-2018 are shown in Table 5. The results indicate that Hong Kong direct property (r=0.17) offered superior diversification benefits with stocks than for HK-REITs (r=0.85) with stocks. HK-REITs (r= -0.07) were seen to provide more effective diversification benefits with bonds than for the Hong Kong direct property with bonds (r=0.45).

Within the direct real estate sub-sectors, hotel (0.06) and office (0.06) were found to be a better stock portfolio diversifier than retail (0.33). In addition, hotel (0.09) offered much stronger diversification benefits for fixed-income instruments than retail (0.28) and office (0.45) could offer.

In the context of an inter-property investment strategy, Hong Kong direct property was significantly correlated with HK-REITs (r=0.34), which could provide a certain degree of diversification in the multi-asset portfolio structure through an effective mixture of private and public property components. In contrast, diversification within the various HK direct property (average r=0.66) subsectors was not desirable, given the very strong relationship between the various subsectors.

Table 5 Hong Kong Commercial Real Estate Correlation Analysis: 2009-2018

	Direct Property	Hotel	Office	Retail	REITs	Stocks	Bonds
Direct Property	1.00						
Hotel	0.83	1.00					
Office	0.87*	0.59*	1.00				
Retail	0.87*	0.85*	0.53*	1.00			
REITs	0.34	0.25	0.23	0.42	1.00		
Stocks	0.17	0.06	0.06	0.33	0.85*	1.00	
Bonds	0.45	0.09	0.45	0.28	-0.07	-0.16	1.00

Notes: The source is author's analysis from MSCI.
* Significant correlation <5%

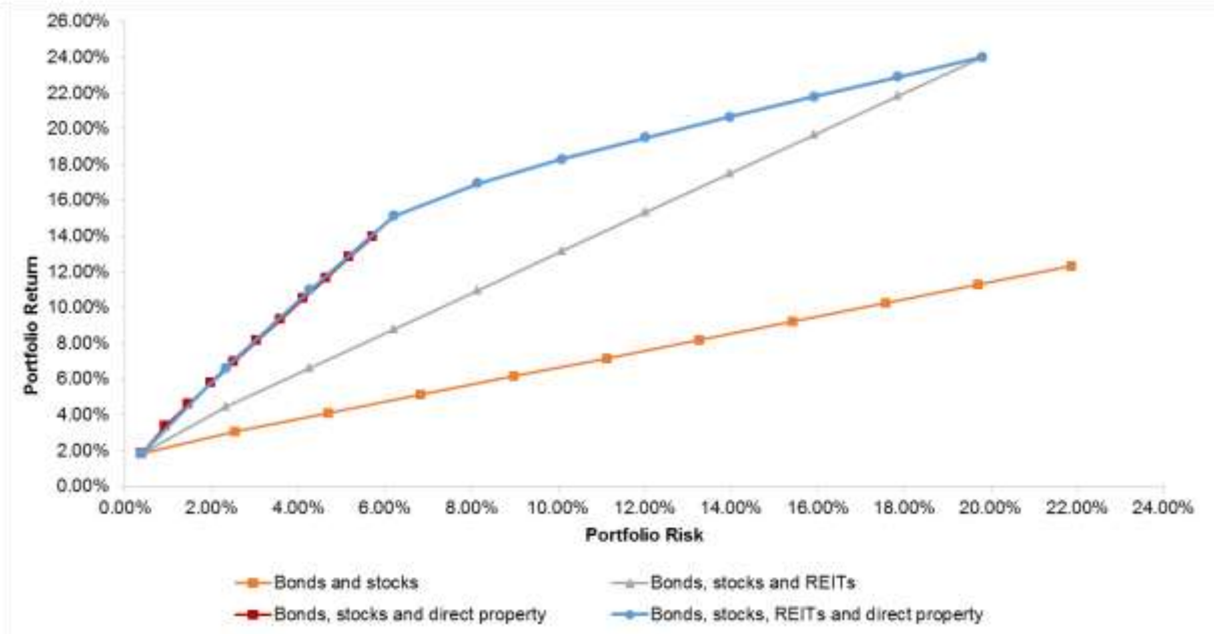
Mixed-asset portfolios

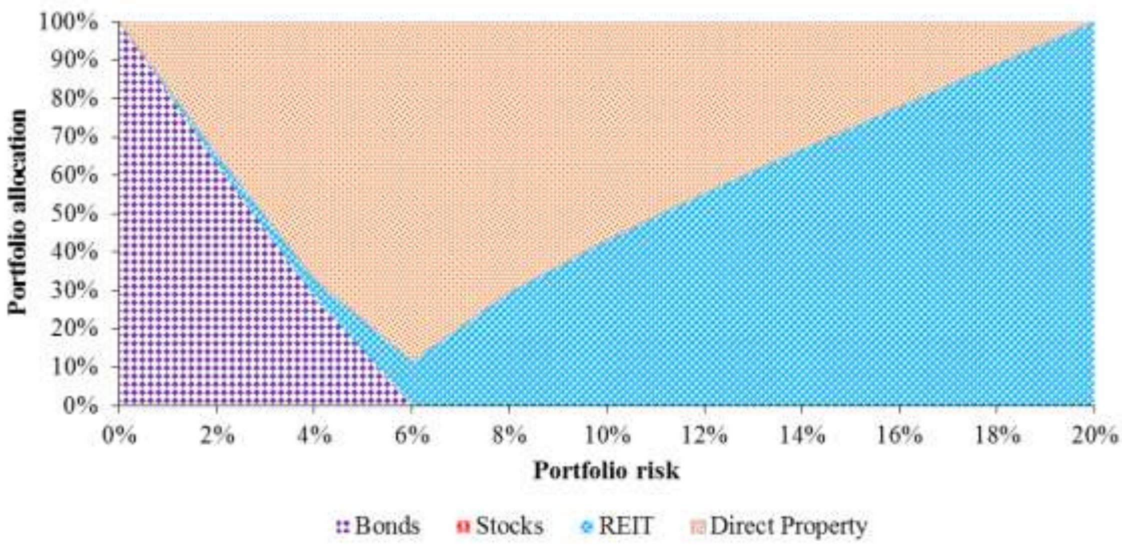
Table 6 presents the efficient frontier of various portfolio mixes and the asset allocation diagram for commercial real estate in Hong Kong over 2009-2018. A baseline portfolio (Portfolio 1) comprised of financial assets (stocks and bonds) was constructed to evaluate the performance enhancement of adding commercial real estate in Hong Kong to missed-asset portfolios. The inclusion of direct property (Portfolio 2) and HK-REITs (Portfolio 3) resulted in upward shifting of the efficient frontier curve compared to the baseline portfolio. However, the efficient frontier of Portfolio 2 composed of financial assets and direct real estate was over a limited risk return band. The portfolio with financial assets and HK-REITs provided a more significant coverage across the risk-return spectrum. The three-asset framework with the Hong Kong direct property component resulted in a much steeper and shorter efficient frontier, which signifies stronger portfolio return enhancement without significant increase in portfolio risk. In contrast, the three-asset framework with a HK-REITs component gave a more diverse coverage of the portfolio risk spectrum, evident by the longer efficient frontier curve.

When the mixed-asset framework was enlarged to include all assets (Portfolio 4), the overall risk-return curve exhibited significant improvement across the entire risk-return band; this being the efficient frontier with the highest efficiency. In the four-asset portfolio asset-mix, the greater risk-adjusted returns of the Hong Kong direct property saw it co-existing with bonds, and to a lesser extent with HK-REITs in the conservative to moderate portfolio risk-return spectrum, before complementing HK-REITs in the upper-half of the risk spectrum. Stocks did not form any part of this optimal portfolio.

Table 6 also presents the different asset weightings of Portfolio 4. The conservative optimal asset-mix (delivering the lowest level of portfolio return (1.86% p.a.) and risk (0.39%) was monopolized by bonds. However, this changed when bonds were omitted entirely, which occurred when the portfolio return and risk reached the moderate level of 15.14% p.a. and 6.21%, respectively. At this point, the percentages of direct property and REITs increased to 88.46% and 11.54%, respectively. Form this point, direct property's strong role starts to decrease, complementing the REITS in the upper –half of the risk spectrum. Stocks did not form any part of this optimal portfolio.

Table 6 Hong Kong Commercial Real Estate Efficient Frontiers and Asset Allocation Diagram: 2009-2018





Note: The source is author's analysis from MSDI

A constrained optimal asset allocation analysis was then performed to reflect a realistic real estate allocation in institutional investor portfolios. The first scenario involved the imposition of a cap of 10% each for both Hong Kong direct property and REITs (Table 7 Panel A), while the second scenario saw the total allocation for direct property and REITs capped at 10% (Table 7 Panel B). Meanwhile, allocation in stocks and bonds were not constrained in both scenarios.

The first scenario still resulted in both forms of Hong Kong commercial property investment vehicles being prominently featured across the entire portfolio risk-return spectrum, and with the majority of the time at the 10% cap limit. The results are presented in Table 7 Panel A.

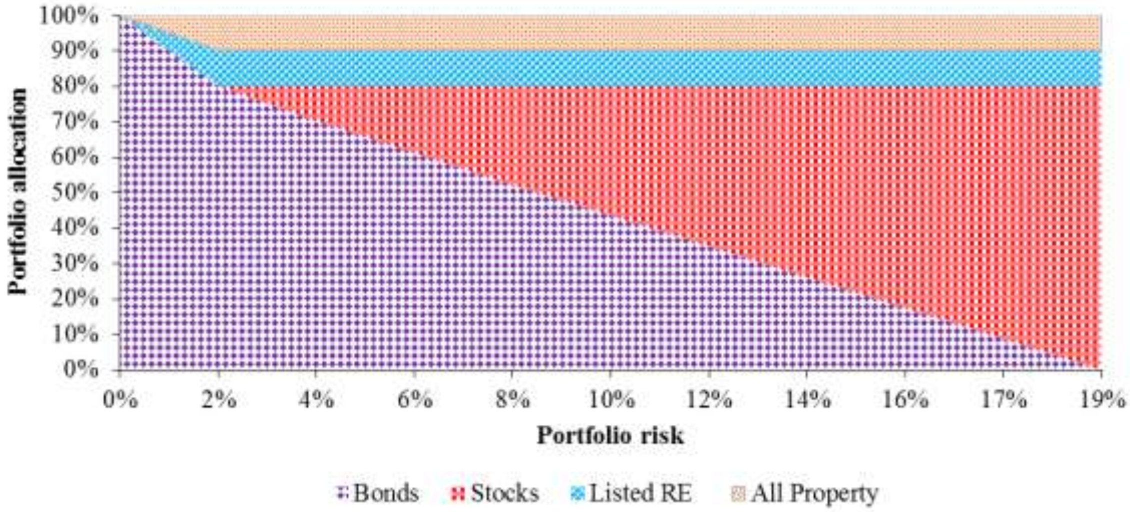
However, the increased competition for allocation between the Hong Kong direct property and HK-REITs in the second scenario resulted in the HK-REITs, being superior in the risk-adjusted performance, dominating the capped allocation in the portfolio risk-return spectrum. Direct property did not form any part of this optimal portfolio. This signifies the stronger added-value role of the HK-REITs within the ambit of the 10% capped allocation to commercial real estate. Results presented in Table 7 Panel B. It is also apparent in the limited exposure to real estate assets, bonds and stocks had more active roles in shaping the portfolio risk-return profiles. This saw bonds dominating the lower half of the portfolio compositions, and gradually taken over by stocks as the risk level increased.

When the maximum allocation of total of direct property and REITs are limited to 10%, the optimizer showed that the most optimum way of constructing the portfolio is to only allocate to REITs, not to direct property. This shows that in the changing dynamics of the portfolio allocation, when there is a very high return asset, most of the time that asset will be included in the portfolio, therefore .it is not optimum from the perspective of the analysis to include direct property within the 10% confined allocation.

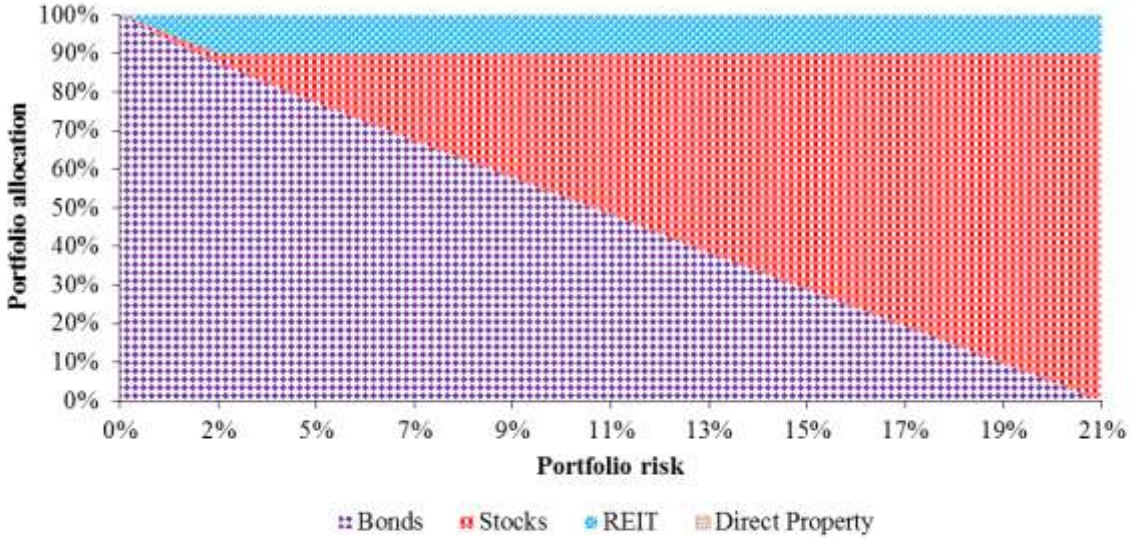
Overall, both direct property and HK-REITs deliver superior risk-adjusted performance compared to the stock market. Direct property also offers high diversification benefits to investors with their marginally correlated returns with stocks, while excellent diversification benefits with bonds are evident for REITs. Part of this demonstrated smaller portfolio diversification benefit by REITs sector can possibly be attributable to the expected co-movement by the REITs market with the Hong Kong stock market that was much dominated by large property company stocks. The superior risk-adjusted performance of Hong Kong commercial property sees both direct property and REITs contributing significantly to the mixed-asset portfolio throughout the entire risk-return spectrum.

Table 7 Hong Kong Commercial Property Constrained Asset Allocation Diagram

Panel A



Panel B



Note: The source is author's analysis from MSDI

REAL ESTATE INVESTMENT INPLICATIONS

The real estate market in Hong Kong is an important market available to both local and institutional real estate investors seeking high quality Hong Kong commercial property exposure. Hong Kong is viewed as one of the most dynamic and sophisticated commercial real estate markets in Asia. The development of HK-REITs in 2005 provides additional investor choice for listed property exposure on the Hong Kong stock market. This paper has highlighted the performance and added-value of Hong Kong commercial real estate over the ten-year period since the GFC, with both Hong Kong direct property and HK-REITs offering significant risk-adjusted returns over the stock market. While past performance is no guarantee of future performance, the full period analysis for 2009-2018 using MSCI data indicated the competitive performance of Hong Kong commercial real estate compared to the other major Hong Kong asset classes.

The findings presented in this study confirmed the results of previous studies on two fronts. First, when the mixed-asset portfolio was enlarged to include both forms of commercial property, Hong Kong direct property was seen to be optimally configured in the lower half of the portfolio risk-return spectrum, while HK-REITs assumed a more significant role at the higher-end of the portfolio risk-return spectrum. This indicates that accessibility to private property investment opportunities could alter the dynamics of the property allocation in a mixed-asset portfolio.

Second, investors' risk tolerance is crucial in determining the optimal allocation in both the private or listed property asset spaces, especially when the total property allocation in a portfolio is constrained. Hong Kong direct property was found to be the most suitable form of property investment for investors with conservative to moderate risk-return requirements. Also, the results indicate that a certain degree of redundancy occurred between private and public property over the ten-year period. This was particularly observable in the constrained asset allocation analysis. Most importantly, this research adds to the diverse existing body of knowledge on Hong Kong commercial property's role in a mixed-asset portfolio, both for direct property and REITs. This is particularly important for global pension funds seeking Hong Kong property exposure with both Hong Kong direct property and REITs playing an important role.

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