

Chinese Residential Property Markets: Applying Diversification Principles and Practices

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Abstract

This research examines the portfolio allocation benefits of five selected Chinese residential property markets; Beijing, Shanghai, Guangzhou, Tianjin and Chengdu. The six years of reliable quarterly rent and capital growth data from DTZ Property Consultants was converted to annualised total returns. The results illustrated that the selected Chinese residential property markets provided an average 19% annual return apart from Shanghai at just below 7%. Based on the Markowitz constrained mean-variance model, the optimum residential portfolio allocation is anchored by a Beijing residential property with the portfolio exposure to the Guangzhou and Tianjin residential property market. This achieved a 25% improvement in risk adjusted returns to that of a single location residential property portfolio. Similarly, the benefits of diversification by combining an investor's primary location with an additional residential property in an alternative location, leads to either a higher return or a lower risk profile. In highlighting the benefits of diversification, defined long-term data series and more knowledge on the Chinese residential property markets will increase Chinese investor appetite for executing a successful long term residential property portfolio strategy.

Key words: Chinese residential property markets, investment measurements, diversification analysis.

The Authors would like to acknowledge the support of DTZ Property Consultants in supplying the Chinese residential property data.

1. Introduction

China has one of the strongest economies in the world. In part, the rapid economic growth has been fuelled by Chinese entrepreneurs providing a dynamic and innovative private sector. Many of these successful Chinese entrepreneurs are self-made millionaires and are financially wealthy.

Bain and Co (2011) have classified Chinese individuals with more than RMB 10 million (US \$1.6m) in investable assets as high net wealth (HNW) investors. Currently, there are over 500,000 Chinese in this bracket, double the number of three years ago. These high net wealth (HNW) Chinese investors have an average RMB 30 million (US \$4.7m) investment portfolio, across a range of investment asset classes which includes an average allocation of RMB 4.1million (US\$645,000) to property.

HNW investor's property allocation would primarily be limited to residential properties, as generally, it is an easily understood affordable physical asset. In detailing the benefits of residential property as an investment, performance can be driven by local factors and government policies. This can lead to a range of returns across the different Chinese residential property markets.

The residential property data is supplied by DTZ Property Consultants. To match the Chinese HNW individuals requirements both as prospective investors and occupiers the research selected high-end residential properties within the selected cities. The six years of reliable quarterly rent and capital growth data has been converted to total returns. This will allow performance comparison across the selected Chinese residential markets.

To better understand the performance of Chinese residential property markets, this research examines high end residential property markets in five leading Chinese cities; Beijing, Shanghai, Guangzhou, Tianjin and Chengdu. Please see Table 1 for the characteristics of these major Chinese cities.

Table 1

Leading Chinese Cities

	Size ¹ (sq km)	Location	Population (million)	Economic Activity (GDP 2010, CNY billion,)	Key Industry Activities
Beijing	16,801	Northern China	19.6	1,377	Central and local government, regional headquarters for State Owned Enterprises, culture (media and communication), information technology
Shanghai	6,340	Eastern China	23.0	1,687	Finance, regional headquarters for multi-nationals, exporters/importers, local government
Guangzhou	7,434	Southern China	12.7	1,060	Manufacturing, transportation, biotechnology, local government
Tianjin	11,760	Northern China	12.9	911	Manufacturing, electronics, aerospace, petroleum, maritime industry
Chengdu	12,132	South West China	14.0	555	Information technology, finance, food, medicine, aerospace, local government

Source: Higgins and FangFang 2012

Table 1 details the selected Chinese cities for this research on their residential property markets. Each city demonstrates unique characteristics which provide the determinants that drive the respective residential property markets.

In addition, the research highlights the significance of diversification, as the performance across residential property markets may vary. Asset allocation strategy across the selected property markets can outperform a single residential property market. This approach is particularly relevant to Chinese HNW individuals, who traditionally have strong local exposure to a specific residential property investment market.

In recognising future performance is separate from past returns, historical property performance and an asset allocation approach can highlight how important a portfolio strategy is when making investment decisions for an illiquid asset. In addition as part of the investment decision making process, property market research is important as to understand current market conditions including future supply and demand determinants. These can vary in the short-term, with new residential developments and the implementation of major economic projects (for example: free trade zones). This information needs to be collected and analysed for a Chinese investor to make an informed decision.

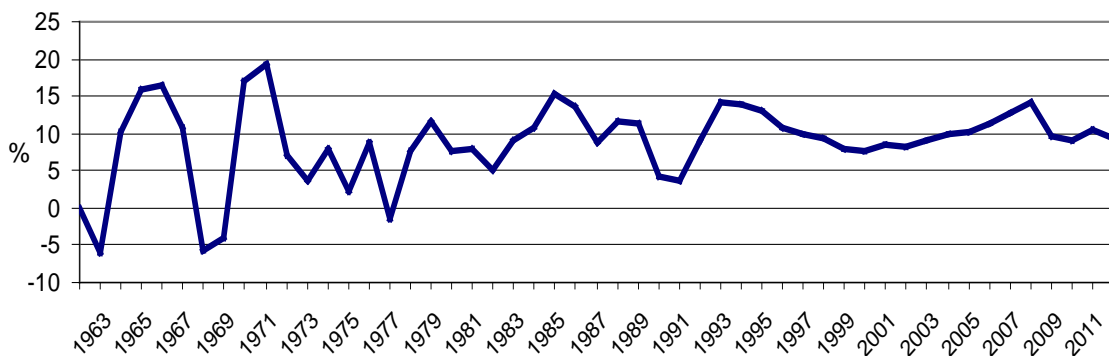
¹ Under administration of the city

Following this introduction, Section two provides a literature review on the Chinese residential property market. Section three details the selected property data and associated methodology. Section four provides the empirical findings and the implications for HNW individuals. The last section provides the concluding comments.

2. Literature Review

The Chinese economy has experienced strong growth over the past 40 years. It has been driven in part by rapid urbanisation with the traditionally large Chinese rural population forming a major migrant labour force, moving from the countryside to cities. The level of Chinese economic growth per year is shown in Figure 1.

Figure 1 **China's Economic Growth (annual % GDP)**



Source: World Bank 2012

Figure 1 shows Chinese economic growth in the last 40 years, the China's economy has grown by just below 9% per annum over the examined period. Part of this impressive growth is underpinned by the major population movement into the major cities. The rapid urbanisation is forecast to continue with a prediction that the current China's urbanisation rate of 44% will in 2015 reach 52% of the total population (Liu 2011, World Bank 2012).

The rapid growth in the Chinese urban population has led to a supply of motivated low cost labour. This, with strong capital support has created several successful high value-added industries. As the workforce becomes skilled, improved wages create an emerging middle class, with strong demand for quality residential accommodation. This is evident in major Chinese cities, where strong economic activity provides well paid employment opportunities (Li 2007).

When examining new supply, the Chinese residential property development market appears fragmented. As in any given city, even the largest developer does not command a new supply market share of more than 10%. Well connected local developers appear to provide the majority of new Chinese residential property supply. The spread of developers and the availability of development finance can create waves of new residential developments in specific locations, leading to spectacular property cycle booms and subsequent declines (Higgins and FangFang 2012, Lynn and Wang 2010).

Zhang (2008) extensively researched the Chinese residential property market. The strong market fundamentals based on location are explained with an overlay on the attractiveness of residential property investment compared to alternative asset classes. The key residential property characteristics are:

- i) Historically sound stable income returns
- ii) Generally an easily understood asset class
- iii) Physical tangible asset unlike shares
- iv) Limited alternative investment channels
- v) Scarcity of land, provides locational value
- vi) Availability of bank loans for residential property

Source: Zhang 2008

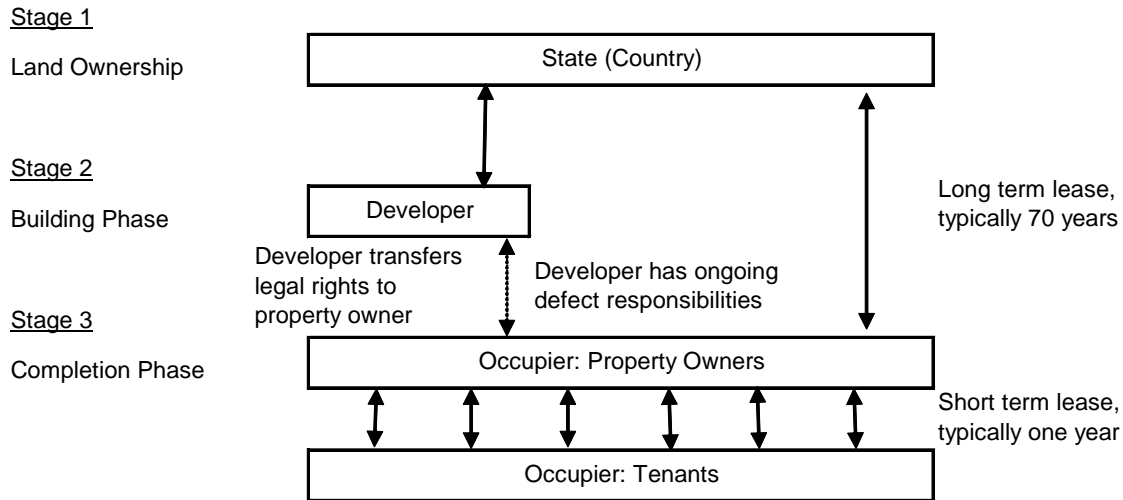
Alongside the investment benefits, the risks associated with property needs to be understood. Baum (2009), Higgins and FangFang (2012) and Rowland (2010), detailed risks associated with residential property investment. These can relate to physical deterioration with obsolescence, property market inefficiency, illiquidity and the requirement for leverage in the vast majority of property investments.

In addition, Kahn (2007) noted that the Chinese legal and regulatory environment is an important consideration. Under the current system, the Chinese Government have legislated that the State retains the title of ownership, but sells the marketable and renewable land use rights to residential developers under a long lease of up to 70 years. This can then be transferred to the property purchaser.

The Chinese residential property legal ownership structure is shown in Figure 2.

Figure 2

Chinese Residential Property: Legal Structure



Source: Higgins and FangFang 2012

Figure 2 shows the legal structure associated with Chinese residential property developments. The Chinese Government terms and arrangements provide the stakeholders with an ownership framework, although legal and regulatory risk is still a key factor when considering the Chinese residential property market (Higgins and FangFang 2012, Lynn and Wang 2010, Wei *et al* 2009).

Bain and Co (2011) and Zhang (2009) reported that Chinese residential property markets can be affected by Government policies, both directly and indirectly. On a broad level, a positive impact was the Chinese Government response to the GFC was a stimulus package of RMB 4 trillion in 2009 and 2010. Likewise at a specific residential property investment level, the Chinese Government has enacted real estate market policies aimed at curbing soaring house prices in specific locations.

3. Data and Methodology

3.1 Data

The availability of quality data is always an issue in undertaking Chinese property research. For this research, DTZ Property Consultants provided their residential rent and yield database for five leading Chinese cities; Beijing, Shanghai, Guangzhou, Tianjin and Chengdu. The data series covered the challenging global economic cycle of the 2005 – 2011 period. In matching the characteristics of the selected property markets with the HNW Chinese investor criteria, Table 2 details the submarkets in these locations.

Table 2

Selected Chinese Residential Property Markets

Location	Series	Type/Grade	Measure
Beijing	Capital Value	Luxury Apartment	RMB / sqm
	Rent	Luxury Apartment	RMB / sqm / mth
Shanghai	Capital Value	High-end (>RMB 30,000)	RMB / sqm
	Rent	Non Serviced Apartment, high-end	RMB / sqm / mth
Guangzhou	Capital Value	Mid high-end	RMB / sqm
	Rent	Mid high	RMB / sqm / mth
Tianjin	Capital Value	Heping, mass market	RMB / sqm
	Rent	Service Apartment (adjusted to deduct service component)	RMB / sqm / mth
Chengdu	Capital Value	Central, mid high-end	RMB / sqm
	Rent	Mid high-end	RMB / sqm / mth

Source: DTZ Research 2011

Table 2 shows the five selected residential property markets. DTZ Property Consultants sourced the property data from a basket of properties. The data is reviewed by a management committee to ensure it is representative of current property market conditions.

For the equivalent market rent, the operating expenses associated with the residential apartments needs to be defined and the associated costs deducted. Please see Table 3.

Table 3

Residential Property Operating Charges

Type	Comments	Change / period covered
Rental Income Tax	Cost directed at the owner. Charge varies with location	5% - 10%
Leasing Agent Fees	A leasing agent earns a commission for finding tenants and handling all aspects of lease negotiations.	Generally each party pays 35% of 1 st month's rental
Management Fee (inc. Strata Title Fee)	Common practice for Chinese property managers to combine individual management of premises and building (strata title) management. This includes collecting rent and dealing with tenant queries alongside, property services (inc maintenance and security) for a residential apartment complex.	5-10% of gross rent pa
Maintenance Fee	Decorations and replacement of the residential dwelling property fixtures and fittings ie A/C system.	Less than 1% of the property value pa
Vacancy Factor	Leasing up period	Allow 2-6 weeks gross rent

Source: DTZ Research 2011, Higgins and FangFang 2012, Zhang 2008

Table 3 illustrates a range of costs that can be incurred when owning a Chinese residential investment property. Outgoing charges vary depending on the type of residential property, level of building services and the agreement with the tenant. For the purpose of this research, the owners' outgoings have been determined at 18% of the gross rent. In addition, owner's income has been annually smoothed, as leasing agents' lease documentation normally provide for a one year lease term (Higgins and FangFang 2012).

3.2 Methodology

In recording the performance of the selected Chinese residential property markets, an investment portfolio can be constructive relative to defined risk and return levels. The Markowitz mean-variance constrained model provided the basis for this analysis. The optimum asset allocation can be determined where the line from the risk free rate (China short term interest rate) crosses the efficient frontier. For further information on modern portfolio theory, please see leading investment text books, for example: Haugen (1997).

The portfolio allocation of the assets will change the risk and return profiles. In investment analysis, a single measure of performance is common; the "*risk adjusted returns*" is based on the Sharpe (1964) model, where the investment return minus the risk free rate (China short term interest rate) is divided by the investment risk.

As this research covers residential property markets which are illiquid and indivisible, the physical allocation may be difficult to implement across the five Chinese residential property markets. Therefore, the analysis also includes an allocation limited to two residential property markets, that of the investor's prime residential location and best residential property investment location. This information would be beneficial for the HNW investor with an average property allocation of RMB 4.1 million.

4. Empirical Findings

The first step is to examine performance of the selected residential property markets over different time periods. Table 4 details the residential property markets quarterly return and annually for 1, 3 and 6 years.

Table 4

**Chinese Residential Property Markets: 2005-2011
Annualised Total Returns**

	3 months	1 year	3 year	6 year	Risk (SD)
Beijing	6.12%	11.95%	20.28%	20.17%	11.73%
Shanghai	-4.25%	-19.31%	-2.76%	6.97%	20.11%
Guangzhou	-1.03%	17.69%	16.61%	24.49%	23.60%
Tianjin	13.16%	6.10%	23.01%	25.29%	16.74%
Chengdu	3.14%	3.50%	22.32%	19.47%	15.58%

Table 4 details the performance of the Chinese residential property markets. The recent short term performance appears irregular compared to the three and six year annual returns. The Shanghai residential property market has experienced a recent decline in residential property values with the fall impacting on the long term (six year) performance. It would appear both Beijing and Tianjin has maintained long term positive performance, although in both instances recently at a lower level.

Compared to the annual six year returns, Figure 3 highlights performance variations across the Chinese residential property markets. The major upside turning points appear random while the downside maximums appear to be confined to 2008 and late 2010. This may relate to the impact from the Government policies introduced to curb rising house prices.

Total returns can best be displayed in an index form. Please see Figure 3.

Figure 3 **Chinese Residential Property Markets: Total Returns 2005 - 2011**

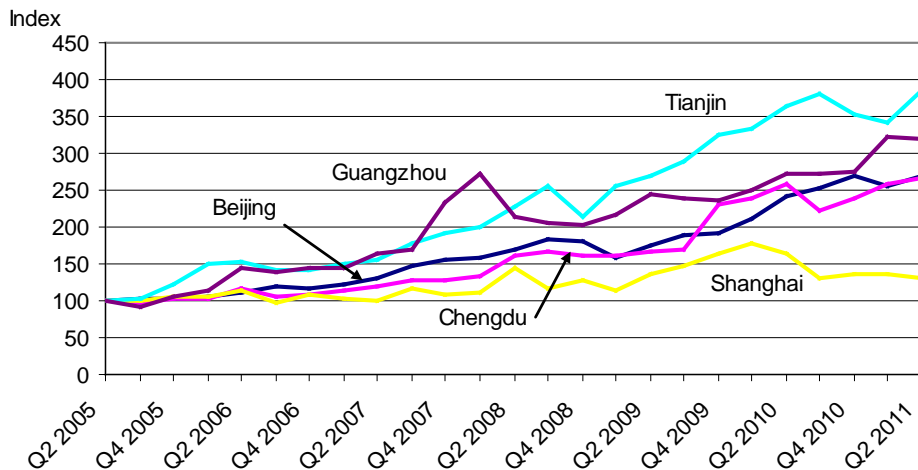


Figure 3 details the performance of the Chinese residential property markets, particularly Tianjin which provided a 285% return over the reported six year period. In part, the impressive returns could relate to the close proximity to Beijing, with the new one hour high speed rail link, and the ability of the city to attract multi national corporations, leading to strong growth in white collar workers. The repricing of the residential property as new demand enters the market forms a key part of locational theory (Higgins and FangFang 2012).

In addition, the residential property market turning points in Figure 3 suggest that the markets operated separately and are influenced by local factors. This can be shown by examining the correlation matrix for the residential property markets, please see Table 5.

Table 5 Chinese Residential Property Markets 2005 - 2011 Annualised Total Returns: Correlation Matrix

	Beijing	Shanghai	Guangzhou	Tianjin	Chengdu
Beijing	1.00				
Shanghai	0.03	1.00			
Guangzhou	0.28	-0.07	1.00		
Tianjin	0.10	0.52	0.29	1.00	
Chengdu	0.40	0.64	-0.16	0.62	1.00

Table 5 illustrates a range of correlation figures, with close to zero being preferred. The major cities of Beijing, Shanghai and Guangzhou appear to have nominal performance relationship, while Tianjin and Chengdu have mixture correlation readings which suggest some similarity in past residential property market determinants.

Table 6 details the annualised total returns descriptive statistics for the selected Chinese residential property markets.

Table 6 Chinese Residential Property Markets 2005 - 2011 Annualised Total Returns

	Return	Rank	Risk	Rank	Risk Adjusted Returns	Rank
Beijing	20.17%	3	11.73%	1	1.48	2
Shanghai	6.97%	5	20.11%	4	0.35	5
Guangzhou	24.49%	2	23.60%	5	1.04	4
Tianjin	25.29%	1	16.74%	3	1.51	1
Chengdu	19.47%	4	15.58%	2	1.25	3

Table 6 illustrates the strong annualised returns of the Chinese residential property markets (19% plus) apart from the Shanghai residential property market. The volatility appear to range (11.73% - 23.60%) across the Chinese residential property market with the Chinese capital city: Beijing, having the lowest recorded risk profile.

The single risk adjusted return measure (Sharpe Ratio) highlights the performance spread across the Chinese residential property markets. Both Beijing and Tianjin appear to performance very well with risk adjusted return reading of 1.48 and 1.51 respectively. This compares to the Shanghai residential property market risk adjusted return reading of 0.35. The mixed correlation matrix readings in Table 5 indicate the diversification benefits that can be achieved by investing in several Chinese residential property markets.

Modern Portfolio Theory has increasingly gained general acceptance in developed countries as the preferred approach to diversify real estate assets. In China, it is now evident that local residential property markets have different demand and supply profiles, for example, please see Table 1, for industry activities in the selected Chinese cities. The variations in returns, risk and correlation matrixes provide the input for the Modern Portfolio Theory model.

The outputs of Modern Portfolio Theory model, specifically efficient frontier calculations, can demonstrate the best asset class weighted allocation overtime to provide superior risk adjusted returns. This can offer considerable improvement in performance to that of a selected residential property market. The Modern Portfolio Theory efficient frontier optimal allocation model covering the five Chinese residential property markets is shown in Table 7.

Table 7 **Chinese Residential Property Markets 2005 – 2011
Efficient Frontier Optimum Allocation**

	Performance	Allocation				
		Beijing	Shanghai	Guangzhou	Tianjin	Chengdu
Return	21.98%	63%	0%	4%	29%	0%
Risk	10.04%					
Risk Adjusted Return	1.91					

Table 7 illustrates the Chinese residential property market optimal allocation has close to 60% exposure to the Beijing residential property market with another 29% in close by Tianjin. This portfolio mix provides a high risk adjusted return of 1.91, which compares to

the top single residential property location (Tianjin) of 1.51, a 25% premium. In recognising the improved risk adjusted return, Beijing and Tianjin are less than one hour tin trip apart.

The illiquid and substantial cost of property restricts the benefits of diversifying across the residential property markets to one or two residential property locations. This is evident by the Chinese HNW individual allocation to property of RMD 4.1 million. This would suggest that, on average, HNW individuals would have one investment property. The preferred location of the residential investment property, allocation weighting and the level of the combined return is shown in Table 8.

Table 8

**Chinese Residential Property Markets, Annualised Total Returns 2005 – 2011
HNW Investors - Property Investment Allocation**

Primary Location	Allocation	Property Investment Location	Allocation	Return	Risk	Risk Adjusted Return
Beijing	59.24%	Guangzhou	40.76%	21.93%	13.35%	1.43
Shanghai	50.00%	Beijing	50.00%	13.57%	11.78%	0.92
Guangzhou	55.25%	Chengdu	44.75%	22.24%	13.77%	1.41
Tianjin	67.00%	Chengdu	33.00%	23.36%	14.95%	1.38
Chengdu	59.66%	Guangzhou	40.34%	21.49%	12.19%	1.53

Table 8 details the benefits of diversification by combining the investor's primary location with a residential property in an alternative location, based on the Markowitz efficient frontier model. The risk adjusted returns can further highlight the benefits of a diversified residential property portfolio with higher returns or lower risk profiles. All residential property markets benefited from an additional property location with improved risk adjusted return performance apart from Beijing and Tianjin, where an additional property would significantly lower the risk reading but also the return readings.

An example of diversification benefits is a Shanghai property investor's second property being located in Beijing. This would offer an increased annualised returns of 94% with a 41% lower risk profile. The Beijing property would represent half the residential property allocation including the investor's main Shanghai residence, see Table 9.

Table 9

**Shanghai HNW Investor: Property Investment Allocation
Quarterly Total Returns 2005 – 2011**

Property Location	Return	Risk	Risk Adjusted Returns
Shanghai property (50%) and Beijing property (50%)	13.57%	11.78%	0.92
Shanghai properties (100%)	6.97%	20.11%	0.35
Difference (%)	94.67%	-41.42%	

Table 9 shows the changes in Shanghai Property investor’s performance by diversifying the property portfolio to a second location: Beijing. The additional performance would equate to an additional return of 6.60% and a lower risk profile. In understanding the value of diversification based on historical data, it is important to understand current Chinese residential property market conditions.

5. Conclusion

This research covers the portfolio allocation benefits of five selected Chinese residential property markets; Beijing, Shanghai, Guangzhou, Tianjin and Chengdu. The six years of reliable quarterly rent and capital growth data from DTZ Property Consultants was converted to annualised total returns with all residential property markets providing an average 19% annual return part from Shanghai at just below 7%.

On providing return, risk (standard deviation) and correlation data, the application of Modern Portfolio Theory demonstrated the attraction of diversification across the selected five Chinese residential property markets. As part of the associated efficient frontier model, the weighed allocation for the five Chinese residential property markets can demonstrate the preferred residential property market mix to achieve the optimal portfolio allocation.

In recording different performance profiles across the Chinese residential property markets, a diversified portfolio of Chinese residential properties anchored by a Beijing residential property, would provided a risk adjusted return improvement of 25% when compared to a single residential property market investment strategy. Similarly, the benefits of diversification by combining an investor’s primary location with an additional residential property in an alternative location, leads to either a higher return or a lower risk profile.

In highlighting the benefits of diversification, defined long-term data series and more knowledge on the Chinese residential property markets will increase Chinese investor appetite for executing a successful long term residential property portfolio strategy. This style of investment analysis would provide an astute Chinese investor with an advantage over the current speculative Chinese residential property investor.

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