ESSAYS ON FOREIGN DIRECT INVESTMENT IN CHINA

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THESIS ABSTRACT

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China has experienced high inward foreign direct investment (IFDI) and outward foreign direct investment (OFDI) flows over the past three decades since it implemented the 1979 equity joint venture law in the late 1970s and the Go Abroad policy in the early 2000s. As a result of these two forms of investment, China has experienced dramatic changes in its economy. This thesis aims to explore China's FDI (Foreign Direct Investment) from a firm, sector and regional perspective.

This thesis includes three empirical studies and is a sector-level analysis focused on investigating the home-country sectorial determinants that impact OFDI relative to IFDI in China. In this study, I explore the extent to which the interplay of the home country's push factors, such as market size, capital, import, technology, export, real effective exchange rate, and labour productivity, has enabled China to transition from a predominantly host country to a home country for Chinese MNE and eventually to a more advanced stage of economic development. The findings of this study indicate that capital, import, export, and real effective exchange rate have a positive impact on the increased share of OFDI relative to IFDI. The findings also show that market size proxied by sector-level GDP per capita has a negative and significant effect.

The second empirical study evaluates the effect of leverage on the internationalisation of Chinese firms from 2009 to 2017. I adopt a novel estimation method using a linear probability model with high dimensional fixed effects on data comprising 200,000 firm-year observations obtained from the ORBIS database. The findings indicate that leverage proxied by debt to asset, debt to capital and long-term debt to asset has a negative impact on the probability of Chinese firms pursuing international investment opportunities.

The third empirical study investigates the effect of regional IFDI on regional house prices in 31 provinces in China from 2006 to 2019. This study adopts a novel approach using a panel quantile estimation with non-additive fixed effects. The results indicate that IFDI has a positive and significant impact on the majority of the quantile estimations. Furthermore, the findings show that IFDI has more influence on low house prices than high house-priced provinces in China.

Additionally, the results show that income, land cost, and human capital have a positive effect across most of the quantiles in the house price distribution. In contrast, house supply, unemployment, and pollution have a negative impact.

DEDICATION

I dedicate this to my mother and father, whose strength, love and guidance continue to inspire and motivate me.

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LIST OF ABBREVIATIONS

EJV	:	Equity Joint Venture.
ECM	:	Error Correction Model
FDI	:	Foreign Direct Investment.
FDIRE	:	Foreign Direct Investment to the Real Estate Sector
IDP	:	Investment Development Path
IFDI	:	Inward Foreign Direct Investment.
ISIC Rev 4	:	International Standard Industrial Classification of all Activities of the United Nations Revision 4.
MCMC	:	Markov Chain Monte Carlo Methods.
MNE	:	Multinational Enterprise.
NACE Rev 2	:	European Classification of Economic Activities Revision 2
NPV	:	Net Present Value
OFDI	:	Outward Foreign Direct Investment.
RMB	:	¥ Chinese Renminbi (Yuan)
SEZ	:	Special Economic Zones
SOE	:	State Owned Enterprise
UNCTAD	:	United Nations Conference on Trade and Development.
VAR	:	Vector Auto Regression

CHAPTER 1 INTRODUCTION

1.1 Background and Motivation

During the past five decades, foreign direct investment (FDI) has become progressively more important to emerging markets, with a growing number of emerging economies succeeding in attracting substantial and increasing amounts of inward FDI (IFDI) (De Mello, 1997). Lipsey (2001) indicates that global FDI flows increased rapidly in the 1970s. This increase was particularly notable in developing countries, where IFDI became a significant component of capital inflow (Dunning and Narula, 1996). The rise in IFDI can be attributed to its growth-enhancing capabilities, so much so that it has been at the forefront of discussions about enhancing economic growth in the global economy (UNCTAD, 2019). A plethora of studies, such as Finlay (1978), Buckley (2010) and Bodmand and Le (2013), indicate that IFDI contributes tremendously to the economic development of an economy through capital inflow, technology and knowledge transfers that fill the technology gap in the host economy. Loungani and Razin (2001) also indicate that IFDI has proven resilient during financial crises. For example, in East Asian economies, such investment was highly stable during the 1997-1998 financial crisis. In contrast, other forms of private capital flow, such as portfolio equity and debt flow, particularly short-term inflows, were subject to significant reversals during the same period (Dasgupta and Ratha, 2000; Lipsey, 2001). For these reasons, developed and developing countries have promoted measures and policies to understand and establish incentives that attract FDI (Blomstrom and Kokko, 1997; Moosa, 2009). It would seem that developing countries have been quite successful in attracting IFDI, so much so that between 2000 to 2019, the share of global FDI flows to developing countries soared from 17% to 47% (UNCTAD, 2019). While the positive impact of IFDI on economies is well understood, Buckley (2010) and Bodmand and Le (2013) indicate that there is comparatively much less research on understanding (i) the next crucial and significant stage of the contribution of IFDI in the development of economies and (ii) the social impact of IFDI, in particular, in terms of its impact on housing affordability. The three empirical chapters of this thesis are built around these two themes and discussed in more detail in the following paragraphs.

Central to developing my hypotheses for (i) above is the understanding of the Investment Development Path Theory (IDP). According to Dunning (1981, 1986) and Dunning and Narula

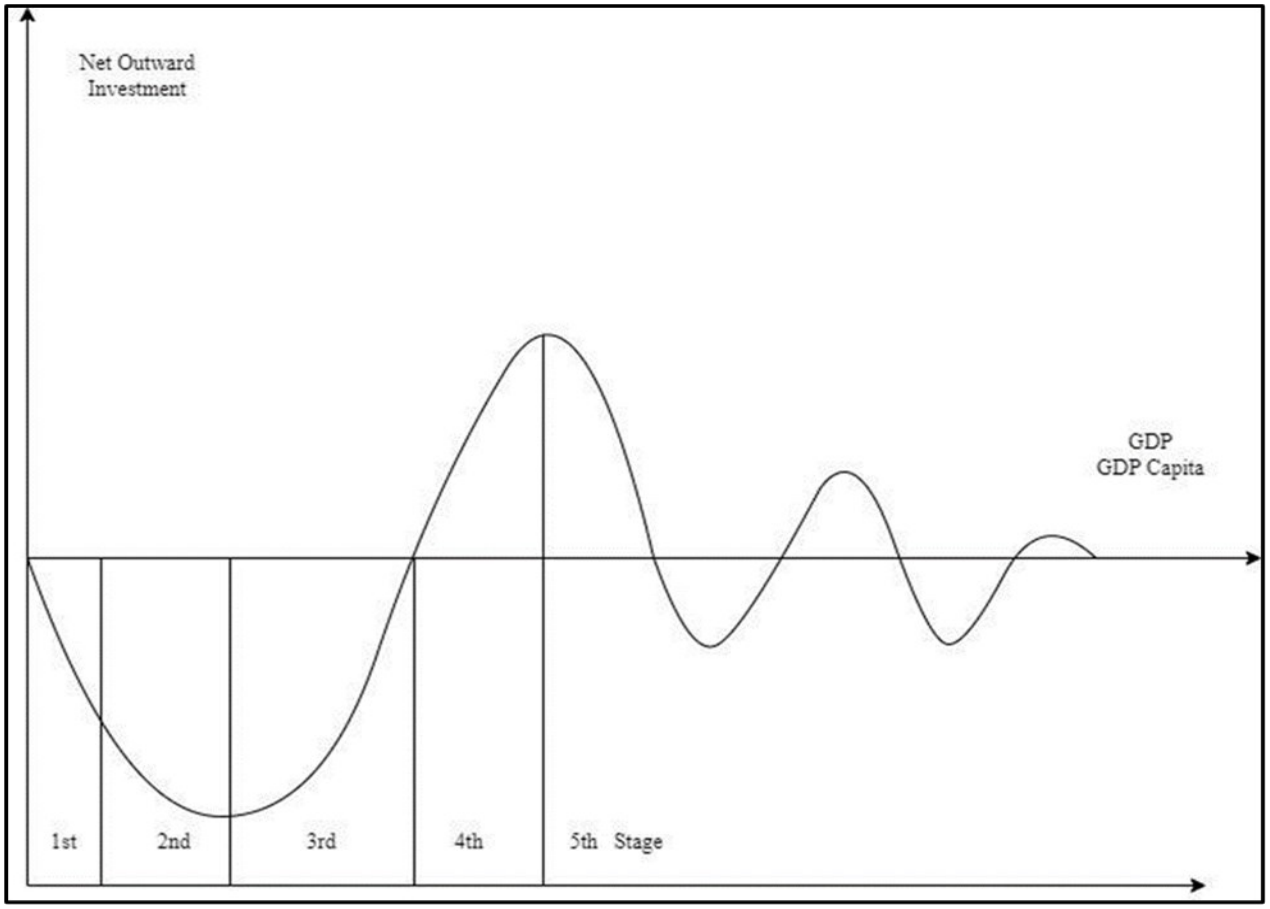
(1996), the IDP theory holds that a country's economic development level is related to that country's IFDI and outward FDI (OFDI) positions. It is a framework that explains the interrelationship between IFDI, OFDI and the economic growth of an economy. Countries tend to transition to a more advanced stage of economic growth, and these phases are categorised according to the ability of those countries to be outward and inward investors (Dunning and Narula, 1979). Based on IDP theory, each economy goes through five stages of development; each stage is defined by the country's FDI position and per capita GDP. In each stage, the factors and motivation of FDI are directly linked to the internal ownership, locational and internalisation (OLI) advantages under the eclectic theory and external elements like the government and competition (Dunning, 2003). In the earliest stage, the economy's infrastructure will be inadequate to support vertical (low labour cost seeking) IFDI. However, as the country develops, foreign investment will increase (Barry et al., 2003). As time progresses, the transfer of knowledge and technology to the host country by foreign multinational enterprises (MNEs) will enable domestic firms to evolve and develop firm-specific assets that will allow the emergence of OFDI (Dunning, 1988). Dunning et al. (2001) argue that during the earlier stages of economic development, OFDI and exports will not be in capital-intensive sectors. Structural transformation occurs as the sectorial orientation of the country changes from labour- to capital-intensive as technological progress and human capital development increase. I will now present a more detailed description of the five stages described in the IDP theory, and a graphical representation of the theory is provided in Figure 1.1.

1.1.1 Stage 1

The first phase of the IDP theory refers to least-developed countries with a negative net OFDI and low IFDI and, thus, net recipients of FDI (Narula and Guimon, 2010). According to Dunning (1981), countries in Stage 1 have a GDP of less than $400 per capita. The IFDI that these first-stage economies attract is primarily resource-seeking (Makino et al., 2002). They have negligible or non-existent OFDI (Dunning and Narula, 1996) because the inward investment is mainly centred on extractive industries such as oil (Asiedu, 2002). Their ownership-specific advantages are negligible and technological capability is non-existent (Dunning et al., 2010). According to Dunning and Narula (1996), countries in Stage 1 engage mainly in imports and have low exports in low and medium capital and labour-intensive sectors. As the countries begin to develop, the quality of the country's capabilities, including their institutional capabilities and social infrastructure, improves (Wang et al., 2012). Dunning and Narula (1997) argue that the degree

of government involvement is limited to providing and upgrading basic infrastructure, human capital generation and research and development capabilities.

Figure 1.1 - The Pattern of the Investment Development Path.



Source: Dunning and Narula (1996) and Narula & Guimon (2010).

1.1.2 Stage 2

In Stage 2, economies have a GDP per capita of between $400 and $1,500. IFDI begins to rise, while OFDI remains low (Narula and Guimon, 2010). The country begins to implement trade liberalising and FDI-incentivised policies and attracts considerable amounts of IFDI (Dunning and Narula, 1996). The location advantages of the host country start to improve in terms of GDP per capita, labour market, trade openness, infrastructure and political and economic institutions. The domestic market grows, and spending power increases, making some domestic production by foreign firms a viable proposition (Dunning et al., 2010). At first, this is likely to take the form of import-substituting manufacturing investments based on their ownership of intangible assets

such as technology, trademarks and managerial skills (Dunning and Narula, 1996). In export-oriented sectors, IFDI is still focused on natural resources and primary products with some forward vertical integration into labour-intensive, low-technology sectors depending on the host country's ability to provide the necessary infrastructure (transportation, communication, skilled and unskilled labour) (Dunning, 1981).

The firm-specific advantage of local firms will have increased from the previous phase if the government has implemented policies that encourage asset accumulation (Dunning and Lundan, 2008). Ownership advantages will be established because of the development of primary industries, and the production process will move to semi-skilled and moderately intensive goods (Dunning et al., 2010). Exports and OFDI emerge but remain minimal (Barry, Gorg and Mcdowell, 2002). This may either be in market-seeking OFDI to countries at a lower stage in the IDP or non-market-seeking directed to more advanced countries (Dunning and Narula, 1996). The extent to which OFDI is generated depends on the home country's government-motivated push factors, such as subsidies, imports, exports, technology and economic performance (Dunning and Lundan, 2008).

1.1.3 Stage 3

In Stage 3, the per capita GDP rises to $4,000, and OFDI increases much faster than IFDI (Narula and Guimon, 2010). Technological capabilities and income increase and are geared toward standardised, high-quality products (Dunning, 1981). Advantages in labour-intensive industries deteriorate, domestic wages rise, and OFDI increases (Dunning et al., 2010). The ownership advantage of foreign MNEs begins to deteriorate as domestic companies gain competitive advantages that allow them to compete with foreign firms in the same industry (Dunning and Narula, 1996). The ownership advantages of the domestic firms in the host country begin to increase because of an increasing stock of human capital brought about by increased expenditure in education, vocational training and research and development capabilities (Stoian, 2013). The increase in the location advantages in terms of capital availability, favourable government policies and increased economic performance will enable further economies of scale, rising wages and more technology-intensive production. This ultimately results in an upgrade in the host country's macroeconomic environment, thus enabling the transition from a recipient country to a home country for potential MNEs.

1.1.4 Stage 4

Domestic firms from host countries will begin to show characteristics of multinationality. A country is in stage 4 when its outward direct investment OFDI stock exceeds or equals the IFDI stock, and the rate of outward investment is growing faster than that of inward investment. During this stage, domestic firms have the capability and competitive advantage to compete with foreign firms in their domestic market and internationally (Dunning and Narula, 1996; Dunning and Lundan, 2008). The sector orientation of the country has changed from a labour-intensive economy to a country that embodies predominantly capital-intensive sectors. The IFDI directed to Stage 4 countries is from developed countries motivated by strategic, efficiency and asset-seeking opportunities. Some IFDI will also originate from economies at a lower stage of the IDP and are likely to be market-seeking, asset-seeking and trade-related (Dunning et al., 2010). The local market is significantly more competitive, as neither local firms nor foreign MNEs have a distinct and sustainable competitive advantage. Labour costs in Stage 4 are high, and producers and manufacturers require extensive capital for higher innovative activities.

Dunning et al. (2010) indicate that, in this stage, both OFDI and IFDI acquire foreign assets and technology through cross-border M&As and by establishing joint ventures to gain strategic assets. The ownership and location-based advantages obtained from the IFDI activities, government policies, and economic growth produces the continuous increase of OFDI. MNEs will seek to maintain competitive advantages by relocating production processes to offshore locations. To protect their ownership advantages through internalisation, firms will move exports to engage in OFDI (Dunning and Narula, 1996). The ownership advantage of countries in this stage is broadly similar, and intra-industry production will become more important (Dunning et al., 2010). Government policies are implemented to protect and upgrade the resources and capabilities of domestic assets and firms (Narula and Guimon, 2010). However, the government does not take an active role in managing IFDI and OFDI; its function is to maintain supervisory and regulatory positions to ensure an efficient market mechanism (Dunning and Lundan, 2008).

1.1.5 Stage 5

Economies in Stage 5 obtain advanced knowledge and are well-developed, with the highest endowment of technology-intensive assets. Domestic firms are more able to pursue international investment compared to countries in Stage 4 (Duran and Ubeda, 2005). As illustrated in Figure 1.1, the net outward investment (NOI) position of the economy first falls and later fluctuates

around the zero level. The competition between domestic firms and foreign MNEs is significantly higher as both conduct business internationally, and each continues to acquire strategic assets to sustain a competitive advantage. This is the scenario for advanced industrial economies such as the US (Dunninad and Narula, 1996). In this stage, governments assume the role of strategic oligopolists, considering the behaviour of other governments in the formation and execution of their macro-organisational strategies. They are more likely to proactively promote efficient markets and cooperate with firms to reduce structural constraints and transaction costs. They also support upgrading technology and human capabilities to strengthen location-specific advantages.

Thus, the interrelationship between IFDI, OFDI and economic growth is established by adopting the IDP paradigm. Because of the dynamic nature of international business, Duran and Ubeda (2001) modified the IDP to improve its explanatory power. In their new method, inward and outward flows and stocks replace NOI because IFDI and OFDI are different in nature. Their modification includes using GDP per capita and accounting for trade and technological capability.

Having described the IDP theory, I can now develop the three research questions of this thesis further. The benefits of IFDI have been discussed in studies such as Asiedu (2002), De Mello (1997), Zhang and Daly (2011) and Pradhan (2011). In addition to economic growth, host economies also benefit from technological spillovers, improvement in management practices and growth in employment. Some studies have shown that when host economies, in turn, start generating a substantial amount of OFDI, this accentuates the benefits of IFDI (see, e,g). Further to this, the IDP theory postulates that in countries where OFDI starts to increase as the share of IFDI, these economies will reach a higher level of economic development and prosperity, Figure 1.1. There is, however, very little work that tries to understand the factors that enable the share of OFDI to grow as a share of IFDI, and therefore this is where the first empirical chapter will contribute. Continuing along the same theme, the second empirical chapter will investigate the determinants of OFDI with a particular emphasis on understanding how finance enables firms in their quest to internationalise – an area of research which is virtually non-existent. As discussed earlier, almost every less developed and developing country is devising policies to attract IFDI so enable their economies to grow. The work in the first two chapters will enable such economies to get a better understanding of how they improve their share of OFDI to IFDI, and this will enable them to (i) accentuate the benefits of IFDI and (ii) attain an even higher level of prosperity through enabling more OFDI.

As developing countries become richer, especially through the context of IFDI and OFDI, it becomes necessary to understand what impact foreign investment is having on society beyond economic growth, technological transfer and management know-hows. Within this context, the final empirical contribution of this thesis focusses on the impact of the IFDI on the host economy but from a perspective that is largely ignored in the literature. One of the most basic needs of human beings is housing. Housing affordability is currently a big issue that many economies are trying to address, and the literature also indicates that significant differences exist in regional house prices within the same economy (see, for example, Bissoondeeal, 2021). This study intends to investigate the impact of regional FDI on regional house prices. In particular, my study will shed light on whether differences in FDI are leading to regional disparities in house prices. To the best of my knowledge, this is the first study to make such an investigation.

In summary, therefore, the thread that runs through this thesis relates to foreign investment. The first two empirical chapters will contribute to our understanding of how less developed and developing countries can improve their OFDI positions, enabling them to achieve a higher economic level of development. The third and final empirical chapter will shed light on the potential housing affordability disparities that developed, and less developed countries might experience once they successfully attract IFDI and generate significant OFDI.

1.2 China

The focus of this study will be on China. There are multiple reasons for this choice. (i) As discussed earlier, a number of developing and less developed countries are devising policies to attract FDI with the intention that this will, in turn, speed up economic development. With this in mind, I want to focus on studying developing or less developed countries so that the findings can be used to support such countries in their quest for economic development. However, not many countries in that category offer a rich dataset that will enable me to investigate the issues I identified earlier. China is one of the very exceptions in this category that provide a rich dataset. (ii) As previously discussed, one of the key contributions of this thesis will be to investigate what enables a less developed/ developing economy to attain a significant amount of OFDI compared to the amount of IFDI it generates that propels the economy to a higher level of economic growth. There are, however, not many economies that have been able to achieve a significant amount of OFDI in relation to IFDI and achieved remarkable growth in their economy. China is one of the very few exceptions. Not only has China been able to generate a significant amount of OFDI in relation to IFDI, but in the year 2000, OFDI exceeded IFDI, as Figure 1.2 illustrates.

Figure 1.2 The flow of IFDI and OFDI flows from 1979 to 2015.

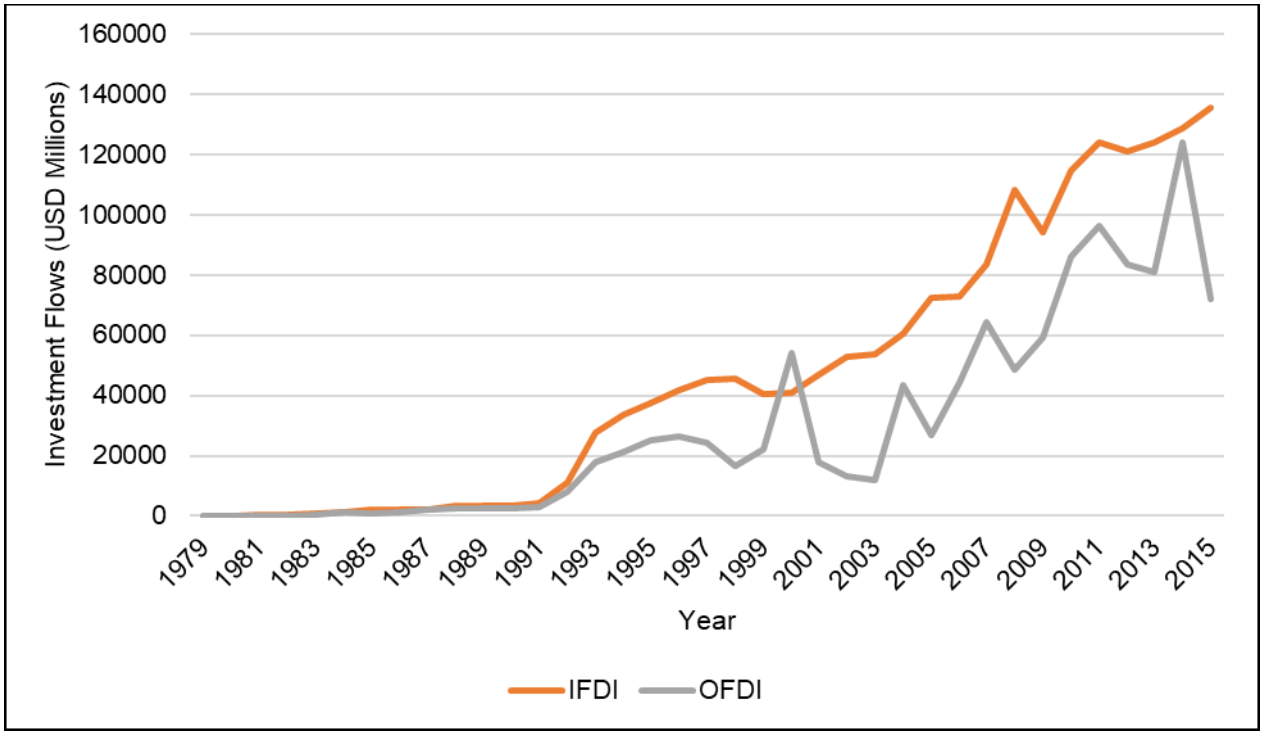


Figure 1.2 illustrates the flow of IFDI and OFDI flows from 1979 to 2015. Data was obtained from UNCTAD.

Whilst at an aggregate level OFDI only temporarily exceeded IFDI, at a sectoral level, there are several sectors in China where OFDI exceeded IFDI and has maintained that tendency. I will illustrate the trends in OFDI and IFDI at a sectoral level in the first empirical chapter (Chapter 3). Therefore, such sectoral data provides me with a unique opportunity to investigate what factors contribute to the growth of OFDI in relation to IFDI, which, as the IDP theory predicts, will eventually enable countries to achieve a much higher level of economic prosperity. (iii) The dynamic market's dynamic nature of China, specifically its state-capitalism practice, offers rich research opportunities for empirical tests of its IFDI and OFDI structure from a novel perspective. (iv) There are not many developing/ less developed countries that have regional data on FDI and house prices. Once again, the availability of such data for China provides me with the unique opportunity to contribute to a research area where research is virtually non-existent.

1.3 Position in the Literature and Preview of Results

In the earlier sections, I outlined my research questions; in this section, I will position my research questions more explicitly in the literature and preview the results from the three empirical chapters.

1.3.1 First empirical chapter

The majority of existing studies, such as Asiedu (2002), Chakarabarti (2003), Mossa (2009) and Boateng et al. (2015), Blonigen and Piger (2014), Bevan and Estrin (2004), Kolstad and Villanger (2008) and Asiedu (2008), focus on host country determinants of IFDI. Perhaps not to the same extent, but some studies also examine the determinants of OFDI, and most are for developed countries. Investment Development Path theory suggests that countries that attain a substantial share of OFDI in relation to IFDI will attain higher economic prosperity. Therefore, for countries relying on FDI to boost their economies, it becomes necessary to understand the drivers of OFDI/IFDI, enabling them to reach a higher level of economic development. Such studies are, however, lacking in the literature. One reason may be due to the fact that many developing or less developing countries have not attained a sufficiently high level of OFDI. China is an exception, but even in its case, at the aggregate level, OFDI only exceeded IFDI temporarily. At a sectoral level, however, OFDI has exceeded IFDI and maintained that tendency in many sectors. This, therefore, provides us with a unique opportunity to investigate the drivers of OFDI/IFDI. This is the first study to explore the drivers of OFDI/IFDI using Chinese sectoral-level data.

The specific variables I include in my model to explain OFDI/IFDI are market size, capital formation, import, export, labour productivity and real effective exchange rate. I constructed a unique sector-level dataset integrating firm-level data from ORBIS and national-level data. The dataset used is comprised of China's sectors from 2009 to 2015. As discussed earlier, the use of sectoral data has enabled us to investigate what factors enable the growth of OFDI as a share of IFDI. In addition, the use of sectoral data within the context of panel econometric analysis enables me to circumvent issues that will arise using a short sample that will arise in a time series context. Therefore, I also adopt a fixed-effects estimation method that takes into account time and sector dummies to control for the average difference across sectors and time in the dataset. The results of the empirical chapter find clear evidence of heterogeneity between the sectors. Some sectors contribute more to the increased share of outward investment than others.

Notably, the results also depict that exchange rate, capital, export and import are positive and statistically significant. This indicates that the availability of capital and imports to China's sectors are essential to the country's increase in OFDI relative to IFDI. These results, therefore, provide some insights as to what macroeconomic factors less developed and developing countries can target to influence the growth of OFDI/IFDI and consequently achieve a higher level of economic growth. In particular, these are capital, trade and exchange rate.

1.3.2 Second empirical chapter

Continuing within the broad theme of trying to understand the drivers of OFDI, the second empirical chapter explores how finance, particularly corporate leverage, facilitates Chinese firms' propensity to pursue outward investment. The second empirical chapter moves the focus from a macro to a firm-level perspective. Shifting the focus deeper into the firm-level analysis, I explore the notion that outward investment decisions are not predominantly based on macroeconomic factors but also on firm-level characteristics. Many studies on the dynamic between leverage and investment are present in the existing literature (Dudley, 2012; Chen et al., 2014; Melgarejo-Duran and Stephen, 2020). But importantly, these studies predominantly focus on the extent to which leverage decisions impact domestic investment (Lang et al., 1996; Aviazian et al., 2005). There are not many studies that look at leverage and international investment. When it comes to OFDI and leverage within the context of developing countries, there are even fewer studies, and most of them seem to contribute to the discussion on leverage and exporting (e.g., Egger and Kesina, 2013). By using a unique firm-level data based on Chinese firms, this study provides novel insights into the relationship between leverage and OFDI. A further contribution of this chapter is that I make a methodological contribution to the debate on leverage and OFDI. In particular, I employ the novel method of using a linear probability model, which allows us to incorporate high dimensional fixed effects into the model to account for heterogeneity in both the parent and subsidiary firm, country-specific factors constant across time, country-specific factors that change across time, and time-specific factors in contrast to other commonly used methods such as probit and logit.

For the second empirical chapter, I utilise a unique ORBIS cross-border merger and acquisition dataset from 2009 to 2017 to examine the impact of firm leverage on the probability of Chinese MNEs pursuing international investment. Guided by the literature and the availability of data, I also include firm size, profitability and tangibility as control variables in my model. I also experiment with different measures of leverage (Debt to Asset, Debt to Capital, and Long-Term

Assets). The result of the study finds that all measures of leverage are negative and statistically significant in explaining the probability of firms pursuing international investment. The implication of such a finding is that over-leveraged Chinese MNEs are potentially restricted from pursuing international investment. This may be because of limitations in their ability to seek additional debt financing or generate internal funding due to the overleveraged state of their firm's finances. Therefore, the lesson for less developed and developed from this analysis is that high levels of debt by their domestic firms will restrict their ability to internationalise and also slow down the generation of OFDI at a national level.

1.3.3 Third empirical chapter

Whereas the first two chapters sought to investigate how China can generate a substantial amount of OFDI, which will ultimately help them reach a higher level of economic development, the third and final empirical chapter seeks to understand the impact of successful attraction of IFDI and generation of OFDI on the home country beyond economic growth, technology transfer and managerial know-how. In particular, it seeks to understand whether the success of FDI in China is inadvertently contributing to housing affording in China.

The real estate sector has long been a significant industry in China's economy, supporting social welfare, government revenue, and citizens' livelihood (Hui and Chan, 2014). In addition, the continued development of the housing market has contributed to an enhanced significant expansion in demand in other industries, such as construction and building materials in the retail industry (Ren et al., 2012). Moreover, studies such as Gholipour (2014) and Song and Gao (2007) indicate that China's economy, especially its investment, consumption, and financial sector, is linked to movements in the real estate sector. China has undergone several policy reforms over the past four decades, which have considerably restructured its real estate sector to ensure its effective and economic contribution to China's economy (Yang and Chen, 2014).

Tsai (2018) indicates that the rapid appreciation in real estate prices may also cause considerable adverse effects on an economy. Firstly, as real estate is a significant consumer need, the rapid appreciation in housing prices leads to a substantial burden in living costs on households (Gholipour, 2014). Also, given its classification as an investment and source of wealth, the increase in real estate prices can contribute to income disparity in an economy (Glaeser et al., 2017). Moreover, historical data indicates numerous examples of economies

being affected by extreme market turbulence and economic loss after experiencing a sharp increase in real estate pricing followed by a slump. This is evident in the 2008 subprime mortgage financial crisis in the United States (US) (Martin, 2010). In this context, the fast growth of the housing market and its possible adverse effects on several economies has been the focus of much debate (Wang et al., 2017).

According to (Rabinovitch, 2013) and Bloomberg (2021), China's persistent increase in housing prices over the years is suggestive of a housing bubble far more detrimental than the 2008 US financial crisis. Moreover, it is noteworthy to clarify that studies such as Tsai (2018) highlight that FDI contributes to the speculative nature of China's real estate prices. Wang et al. (2017) and Azarhoushang et al. (2019) also indicate that masking in China's real estate expansion and FDI growth are regional disparities in house prices and FDI. In line with this, Hu (2002) argues that the benefits of FDI are not evenly distributed across the different regions in China as some areas have location-specific advantages that other regions do not possess. Furthermore, Huang et al. (2010) indicate that China's provinces have significantly distinct macroeconomic conditions, like economic development, income per capita, employment rate, and human capital. Huang (2010) further indicates that these distinctions in macroeconomic factors and the inequality in FDI distribution in China further worsened the regional house price disparity.

Therefore, taking the discussions in the preceding paragraph, this empirical chapter aims to explore whether IFDI may be inadvertently contributing to rises in house prices and, therefore, unaffordability. It does this by employing a rich dataset comprising of regional-level variables. In particular, this chapter utilises regional-level data comprising 31 of China's provinces to examine the impact of regional IFDI on the corresponding house prices. Previous work has been conducted at the national level or has used a much smaller number of regions. The model also controls for income, unemployment, human capital, land cost, and house supply. I adopt a novel approach of using a quantile estimation with non-additive fixed effects to ascertain the extent to which FDI affects the different quantiles of the house prices distribution. By adopting a panel dataset, I aim to account for potential heterogeneity among the provinces. The third empirical chapter also investigates the impact of environmental emissions, i.e., pollution, on regional house prices in China - a perspective that has seldom been explored in the existing literature in the context of China.

The main findings from the third empirical chapter are as follows. First, there appears to be considerable heterogeneity in terms of the impact of IFDI on different regions. Second, the

impact of IFDI on house prices is generally positive. This can potentially be viewed as an adverse impact of IFDI on society from the perspective of the unaffordability of house prices. Therefore, the lesson for less developed and developing economies from the analysis of this chapter is that while IFDI and OFDI help generate higher levels of economic development, it can also worsen housing unaffordability issues. Third, I also find that pollution, which may be a consequence of IFDI, has an adverse impact on house prices.

1.4 Thesis Structure

The remainder of the thesis is organised as follows. The following chapter, Chapter 2, provides an overview of how institutions in China operate. This knowledge will enable me to interpret the findings in more depth. The chapter also outlines China's experience with IFDI and OFDI and the policies that have impacted IFDI and OFDI. It presents an overview of the housing market which will be useful for the third empirical chapter. Chapter 3 contains the first empirical chapter, which essentially investigates the drivers of OFDI/IFDI. Chapter 4, the second empirical chapter, investigates how leverage influences the ability of domestic firms in China to generate OFDI. Chapter 5, the final empirical chapter, essentially investigates whether IFDI is having an adverse effect on housing affordability in China. Chapter 6 concludes by providing a final overview of the findings of the three empirical studies.

CHAPTER 2 OVERVIEW OF CHINA'S INSTITUTIONAL CONTEXT AND FDI

2.1 China's FDI and FDI Policies

Before the economic reforms of 1979, China's economy was closed, and the total volume of its foreign trade amounted to only 7% of its national income (Yao et al., 2017). After 30 years of isolation, China decided to open its economy in 1979 by implementing the 'open door' policy to liberalise trade and allow FDI inflow (Zhang and Van Den Bulckey, 1996). The government implemented these IFDI promotion policies to introduce and acquire advanced technology, equipment, and management methods from foreign countries (Chen, 2018). IFDI was also regarded as an effective way to acquire capital, given the absence of domestic capital at the time (Chen, 2018). Since then, it has gradually taken a number of measures to improve the investment climate and its attractiveness to existing and potential foreign investors (Dunning and Narula, 1996). By 1987, foreign trade volume had increased to 25% of GDP, and by 1998, it to 37% (Ross et al., 2019). Even during the East Asian Crisis, FDI inflow was significant in keeping the economy afloat. During that time, exports, a factor of aggregate demand, decreased due to currency devaluation and the reduced demand from Asian countries, including Japan (Yao, 2018). Some state-owned companies were unable to sustain foreign trade, and foreign companies were crucial in promoting Chinese exports (Chow, 2018). To stimulate exports and improve its macroeconomic condition, the government adopted a variety of measures, including lowering export tariffs and introducing tax incentives. This led to the second component of the open-door policy in the 1980s and 1990s, which included the establishment of special incentive zones to encourage export-oriented manufacturing FDI (UNCTAD, 2012). These zones have since played an important role in attracting FDI and made a significant contribution to economic development (see Table 2.1).

These zones encouraged foreign MNE investment because the Chinese government offered special incentives to foreign investors, reflected in the Equity Joint Ventures Income Tax Law, the Foreign Enterprise Tax Law and Industrial and Commercial Tax Provisions (Chen, 2018). The government also introduced a series of laws and regulations to encourage further FDI inflow, including the Chinese-foreign equity ventures in 1983, a Law that enables enterprises to operate exclusively with foreign capital, and the Chinese-foreign contractual joint ventures in 1988 (Wei, 1999). With these economic reforms, the FDI inflow increased from $430 million in 1980 to $46.9 billion in 2002 (UNCTAD, 2020).

Table 2.1 Special Economic Zones in China

Special Incentive Zone	Year of Establishment	Number of Cities
Special Economic Zones	1980, 1988	5 Cities
Coastal Open Cities	1984	14 Cities
Economic Costal Open Zones	1985, 1988	10 Cities
Economic and Technology Development Zones	1992	32 cities
New High Technology Industrial Development Zones	1992	52 cities
Province capital and open cities	1992	24 cities
Border open cities	1992	13 cities

This table gives an overview of the different special economic zones (SEZ) established in China from the 1980s to the 1990s. The details of this table are obtained from Wei et al. (2009).

There has been an uneven regional implementation of the open-door strategy for FDI from the SEZ, open coastal cities to the inland regions in China. This enabled the coastal region to gain more than other areas (Wei et al., 2009). Consequently, gaps in economic development and income between the coastal and inland regions have increased since the late 1980s. The gains from FDI are more apparent in the coastal areas, regions with FDI policy incentives, leaving the economic development of the inland regions lagging (Wei et al., 2009). The outflow of skilled labour and capital from inland to coastal areas has been increasing (Chen et al., 2018). The Chinese government gradually amended its FDI policies to enhance a more balanced distribution to resolve this. The implementation of these policies has enabled IFDI to serve as a catalyst that encourages the development of domestic business, economic restructuring and economic growth (Suna, 2009).

The mechanism through which IFDI enables growth in China's economy is through the transmission effect of advanced technology (Barthelemy and Demurger, 2000; De Mello,1997),

knowledge transfer (De Mello and Sinclair, 1995) and the promotion of export in capital-intensive industries (Todo, 2003). Through these channels, IFDI has contributed to developing and restructuring Chinese sectors (Dunning and Narula, 1996). Moreover, given a sufficient degree of absorptive capacity in the Chinese economy, newly transferred technology, knowledge, and capital inflow from foreign MNE engendered the ownership advantage of domestic companies in China (Dunning and Narula, 1996). Thus, enabling them to compete with foreign MNEs in their host country and seek outward investment opportunities in the global market (Zhang, 2001; Wei et al., 1999). China's ability to internationalise can thus be attributed to its IFDI, coupled with its economy's policy and economic restructuring.

China's four decades of economic reform and attraction of IFDI seek to upgrade industrial structure, enhance competitiveness, and integrate China into the global economy (Alon et al., 2012). However, the Chinese government saw uncertainty concerning further growth and made a strategic decision to implement the Go Abroad policy in 2000 as part of its 10th Five-Year Plan. This strategy sought to bid farewell to the Mao-era ideology of self-reliance, urging Chinese firms to take advantage of increasing world trade and invest in global markets. This revealed China's ambitions for global leadership and evolved to reflect China's transition from an investment- to an innovation-driven economy.

By 2002, China's FDI and economic development had grown significantly, opening up a new era of FDI development policies that involved China joining the WTO and incorporating the WTO's principles (Li et al., 2003). These included: tariff reductions, the abolition of non-tariff barriers to industrial products, the abolition of import quotas and the phasing out of quotas on exports of textiles and clothing to developed countries. Li et al. (2003) believe that the effect of WTO accession on China's economic growth came through gains from specialisation in international trade and investment and increased efficiency in its industrial sector. As a result of these additional reforms, OFDI tripled.

China's institutional context offers a unique perspective because of the significant involvement of the Chinese government in the country's financial and business landscape. Wright et al. (2005) and Meyer and Nguyen (2005) indicate that understanding the institutional context can help explain the characteristic behaviour of outward-investing Chinese firms. Given the context of government control in China's economy, the institutional environment is likely to have had an extensive and profound impact on the internationalisation decision of Chinese firms. Liu and Li (2002) highlight that Chinese OFDI in the 1980s through to the 90s was directed by the

government towards supporting the export functions of state-owned manufacturing firms, providing stability to the supply of domestically scarce natural resources, and towards the acquisition of information and learning on how to operate in international markets. Notably, Chinese MNEs in the energy and mineral resource sectors were encouraged to pursue international investment opportunities to meet the growing demand in China (Buckley et al., 2010).

China's venture into OFDI was a gradual and steady process. In 2015, China became the world's largest outward investor after the US, with $196.2 billion in OFDI (UNCTAD, 2017). The number of Chinese MNEs increased to 24,400 globally, and $1.1 trillion in OFDI stock was accumulated internationally (UNCTAD, 2020). A significant amount of OFDI stocks were established after the 2008 financial crisis (Agrawal and Khan, 2011), after which growth was substantially higher as the flows in 2015 were three times the level in 2009. The amount of China's OFDI outflows to OECD countries increased from 14.5% in 2009 to 20% in 2015 (UNCTAD, 2020) primarily due to the restructuring of OFDI policy as the Chinese government eased various financial restrictions and offered incentives to foster OFDI from private companies, especially those in high-tech industries.

There were also modifications in the bureaucratic administration and policy reforms in state-owned enterprises (SOEs), which encouraged Chinese OFDI. These adjustments accelerated the upgrading of China's economic structure, which was the primary goal of the 10th Five-Year Plan (Sauvant and Chen, 2014). Another likely reason for the increase in OFDI was the disconnect between the Chinese government and private MNEs. Here, OFDI is regarded as an escape mechanism (Boddewyn and Brewer, 1994). Chinese MNEs took advantage of the changes in bureaucratic administration and conducted OFDI to mitigate institutional, financial and market constraints in China (Knoerich, 2014). Luo and Tung (2007) state that MNE strategies are affected by institutional factors and that Chinese MNEs pursue international investment to secure benefits from the government. The global expansion also serves as a springboard for Chinese MNEs to counteract domestic institutional constraints and market limitations.

To some extent, China is a state-controlled political economy where the state plays a dominant role in driving economic transactions and performance (Chang, 1994; Huang, 2010). The state designs and controls both formal and informal institutions and regulatory, economic, and business activities through formal policy at the central and local levels. The state also creates

the administrative system and arranges government ownership within various industrial sectors. In addition, the state helps shape informal institutional frameworks such as firm-government relationships, political connections and inter-bureau or inter-firm network ties that impact business behaviour (You et al., 2007). The rise of China's political and economic success is embedded in its state capitalist framework. China faces external and internal pressure to enhance national wealth. China's economy and society depend on learning and obtaining resources from other economies to enhance its capabilities and gain successful participation in the global economic stage.

Five important institutional elements are particularly emphasised by the state and successfully enhance the FDI position of firms. The first institutional elements refer to the approval process. The state streamlined the approval procedure and decentralised approval authority for both IFDI and OFDI. Secondly, the state gradually relaxed foreign exchange control, especially in examining capital resources and exchange risks. Thirdly, in providing concrete investment support, the state-supported investment projects for credit, capital, information, subsidies, and tax collection. In addition, the state also aimed to set up more efficient supervision structures on the post-investment performance of OFDI enterprises. Lastly, the state has sought better international protection for firms' global investment by establishing bilateral trade investment treaties and multilateral and regional protection mechanisms.

The IFDI and OFDI institutional regime relates to the wide presence of government ownership of firms in the economy. Since the market reform in the 1970s, the Chinese government has maintained control of the economy. The central and local government agencies provide financing to the SOE-dominated sector; the government also directs funds to SOEs via state-owned banks. As the market economy improves further, SOEs pursue financing from domestic and international financial markets. Through listing their stocks on the exchange market, SOEs are metamorphosed into corporations and joint stock companies. In a joint stock company, state ownership encompasses one type of share and as the dominant shareholder government exerts tight control over both political and economic purposes. For example, SOEs are the main players in OFDI relative to other types of companies and behave aggressively in their outward investments.

According to Li (2009), Chinese SOEs have faced significant criticism from global stakeholders for their lack of accountability, transparency, and trustworthiness in their drive to pursue globalisation. Luo and Tang (2007) indicate that when Chinese SOEs pursue international

investment, their motives and strategies may be predominantly economic, such as maximising profits, or they may include political aspirations that take precedence over economic ones. Pistor and Xu (2005) and Bruton and Jiang (2008) further indicate that the impact of the state and adoption of the administrative governance framework in SOE business activities make economic efficiency unclear. Recent studies suggest that highly concentrated ownership gives the state substantial discretionary power to use the resources of companies and results in problems such as insider control and the exploitation of minority shareholder interest (Bruton and Jing, 2008). Control by the government may also create a fertile environment to nurture corruption (Luo and Tung, 2007). A recent study by Lin et al. (2020) suggests that the newly transformed SOEs are "dynamic dynamos" rather than "dying dinosaurs", indicating that state ownership may impact the performance of Chinese MNEs, including outward investment.

In 2016, global OFDI dropped by 2% (UNCTAD, 2010); however, China's OFDI increased by 34.7%, with OFDI in nonfinancial sectors such as hotels and catering, culture, sports and entertainment, and real estate growing at an unusually faster rate [1] (Wang and Gao, 2018). The Chinese government had begun to notice a substantial amount of capital outflow from these non-financial sectors. In order to control this, the government introduced OFDI regulation policies. A weakening renminbi and China's rapidly declining foreign reserves were a cause of worry for the Chinese government. As of the end of 2015, Chinese policymakers began to implement OFDI regulation measures such as strengthening the legitimacy inspections of international investments. This and also closely observing OFDI in real estate, hotels, cinemas, entertainment and sports sectors were regarded as "irrational" due to their weak linkages to the real economy. In 2017, China's National Development and Reform Commission (NDRC) established a framework categorising OFDI into "encouraged", "restricted", and "prohibited" classifications [2] (Goldman and Potter, 2022). After several regulation policies, Chinese OFDI flows dropped by 29% in 2017, with no new OFDI projects in real estate, sports and entertainment. Aside from the aforementioned reason, OFDI has also presented three main challenges. Firstly, some Chinese MNEs have low awareness of legal compliance and a weak sense of social responsibility, which

[1] From 2008 to 2016, China's ODI flow registered an average growth rate of 27.8 per cent. However, over the same period, the three sectors—namely, hotels and catering services; culture, sports and entertainment; and real estate—grew at an alarming average annual rate of 111.4 per cent, 187.6 per cent and 54.1 per cent, respectively, which was well above the average growth of China's ODI flows (NBS, 2018).

[2] In August 2017, the NDRC, MOFCOM, the PBC and the Ministry of Foreign Affairs jointly issued the Guidance on Further Directing and Regulating the Direction of Overseas Investments, classifying China's ODI into 'encouraged', 'restricted' and 'prohibited' categories. The 'restricted' category includes real estate, hotels, cinemas, the entertainment industry and sport clubs (Wang and Guo, 2018)

has compromised the reputation of Chinese businesses and products and China's global image. As China's capital is spread across international markets, Chinese companies have begun to impact domestic communities in OFDI destinations (Pan et al., 2020). Yet, some companies only value commercial efficiency and exploit unethical business practices such as poor production safety standards, excessive overtime, hiring employees without work contracts and security and causing frequent labour disputes (Wang and Guo, 2018). Widely exposed misbehaviour of this nature has adversely affected the reputation of Chinese MNEs' products and services.

Secondly, substantial Chinese OFDI can unfavourably impact the country's balance of payment and exchange rate stability. Harmful and ineffective investment decisions and risks often result in financial losses and deter the investment profits inflow to China (Wang and Guo, 2018). Some companies illegally amass foreign exchange, transfer assets internationally, and engage in money laundering (Karhunen and Ledyaeeva, 2022). Capital flight camouflaged in OFDI activities has taken several forms. Thirdly, capital structure mistakes and high firm leverage decisions have caused significant economic losses. This is attributed to SOE's overinvestment in negative NPV (Net Present Value) projects without adequate transparency, regulation and monitoring (Brandt and Li, 2003). Due to their state ownership links, Chinese companies, especially SOEs, predominantly rely on large-scale borrowing to finance international investment. As such, high levels of debt impose serious financial pressures, increasing the probability of capital chain ruptures and aggravating China's financial risks (He and Kyaw, 2018).

Aware of the aforementioned risks, the NDRC (National Development and Reform Commission) implemented two regulations in 2017. The first was the Code of Conduct of International Investment by private business, issued on 18 December. It necessitates private enterprises to enhance their internal management structures, comply with legal obligations at home and overseas, fulfil social responsibilities, protect the environment, and reinforce overseas risk management. With regards to SOEs, the equivalent code for SOEs is currently being drafted. The second is the Administrative Measures of Overseas Investment by Businesses (order 11), issued on 26 December, which came into force on 1 March 2018[3]. However, it is essential to note that despite these risks, the positive impact of China's investment has been widely confirmed. These effects include enhancing productivity and domestic employment, increasing

[3] Order No. 11 contains regulatory mechanisms to improve collaborative supervision— including online monitoring, interviews, written inquiries and random verification— and project monitoring, including the introduction of project completion reports, significant adverse event reports and inquiries into important issues (Wang and Guo, 2018)

domestic exports, facilitating economic growth and development, expediting trade structure upgrades, and accelerating investment development.

2.2 Capital and Housing Markets

In the following sub-sections, I will present an overview of China's capital and housing markets, emphasising how the government influences them. The discussions on the capital markets will be particularly relevant for the second empirical chapter, where I investigate the impact of finance on the ability of Chinese firms to internationalise. The discussions on housing markets will be relevant for the final empirical chapter, where I investigate the impact of IFDI on house prices.

2.2.1 China's Capital Markets

Emerging economies increasingly pursue outward FDI (Narula and Dunning, 2000; Stoian and Mohr, 2016). OFDI from emerging markets has become increasingly important as the share of OFDI generated by emerging economies is rising, in contrast to the significant decline of OFDI from developed economies (UNCTAD, 2019). In China, OFDI, in the form of cross-border M&A (Mergers and Acquisitions), has become the vehicle of choice in investment in developed and emerging countries (Sauvant and Masheck, 2009). Contrary to the developed country MNEs, which often base their international investment strategy on obtaining market power and creating synergies, emerging market MNEs are not limited to traditional methods. One significant intent of international investment by MNEs from emerging economies is gaining strategic assets such as technology, brand and management expertise (Cuervo-Cazurra, 2012; Ramamurti, 2012). The acquisition and transfer of global knowledge and technological know-how enable firms from emerging markets to compete more effectively with international competition in both domestic and international markets (Narula and Dunning, 2000).

China offers an intriguing insight into the phenomenon of international investment and outward cross-border M&A by emerging market MNEs. China is a late entry into the global markets, as its overseas investment flows surged after the implementation of trade liberalisation policies by its government in the late 1970s and 1990s. As a result, Chinese MNEs have emerged as the most aggressive outward investing firms in emerging markets in the last few decades. Unlike the 1950s-1970s, when the country's firms remained focused on domestic markets and pursued only limited OFDI, the international strategies of these firms have expanded since the late 1990s (Pradhan, 2011). Large-scale cross-border greenfield investment and the increasing pursuit of

international acquisitions of a variety of firm-specific advantages like access to the new market, technology, know-how and natural resources significantly changed the OFDI profile of China (Buckely et al.,2008; Pradhan, 2008; Pradhan 2017).

Capital markets promote investment opportunities and economic growth by facilitating and diversifying firms' access to finance (Beck et al., 2010; Gupta and Yuan, 2009). Therefore, capital structure and investment decisions are related to the effectiveness of a country's capital markets. The existing literature describes several necessary conditions to achieve a solid and stable capital market which can be grouped into four interrelated pillars: macroeconomic stability, an effective banking system, high institutional quality and an adequate regulatory and supervisory framework (Betkaert et al., 2005; Rojas-Surez, 2014). Berkaert et al. (2005) note that developed economies has stable capital markets, resulting from their efficient institutional quality. MNEs from developed countries have expanded their international activities due to the effectiveness of their home country institutions and capital markets. China offers an interesting perspective because its institutional quality is less advanced than developed countries, but its MNEs are global players. The expansion of their capital markets began later than that of developed countries and is less advanced, but it has 123 MNEs listed on the Fortune 500.

The Chinese state maintains the majority of the shares in listed companies (Lau et al., 2000). Chinese SOEs have become increasingly important in their foreign business activities since the onset of the 'Going global' policy in 1999 (Ramamurti, 2009). Their SOEs are the principal beneficiaries of enhanced government support for OFDI projects (Lin et al., 2020). In numerous cross-border M&A deals, the Chinese government is the largest shareholder in the acquiring firm (Chen and Young, 2010), and as a result, Chinese SOEs have established a significant presence in the global market, as of the 123 Chinese firms in the Fortune 500, 75 are SOEs (Lin et al., 2020).

The banking system in China is dominated by four state-owned commercial banks holding from half to three-quarters of industry assets (Geretto and Pauluzzo, 2009). An additional peculiarity of the Chinese banking system is that the dominant market share of the 'Big Four' banks is a result of their mandate to support outward investment ventures of China's SOEs (Hanley et al., 2011). Hansakul (2004) reports the persistent involvement of the Chinese government, both at central and local government, in credit and capital allocation and the pricing of capital, and Lin et al. (2020) indicate that the Chinese government provides external financing options in the form of soft loans to Chinese MNEs to promote OFDI. SOEs, which are the principal beneficiaries

of these soft loans, are subject to soft credit constraints without adequate financial supervision as in developed countries (Chen et al., 2014).

Private Chinese MNEs are less favoured in receiving external financing (Gregory et al., 2000; Brandt and Li, 2003; Lin et al., 2020). Brandt and Li (2003) indicate that the reason for this is that the Big Four banks[4] are state-owned and are more favourable to SOEs because of the Chinese government's stake in those companies. Private firms also have a higher probability of default, and state-owned banks are more likely to bail out SOEs than private firms. Huang et al. (2018) suggest that Chinese SOEs are encouraged to pursue debt financing through preferential loans, soft loans and loan guarantees due to state influence. For private firms, Khan et al. (2020) observe that they rely on internal financing in retained earnings rather than external financing as a first option. Thus, China's unique institutional and economic environment clearly affects the capital structure and financing decisions of Chinese MNEs. The state capitalist component of the Chinese economy is a factor that differs considerably from traditional models of developed economies, making China's internationalisation, especially its capital structure decisions, an interesting area for study.

The trade liberalisation policy implemented in the late 1970s enabled China to transform from a centrally planned economy to a market-based economy (Qi, 2008). These policy reforms also contributed to the emergence and development of China's capital market, in which SOEs have a significant influence. Their market value accounts for more than half of China's total stock market value, and are the main stakeholders in China's bond market. Their performance is thus closely linked to that of the stock market (Carpenter et al., 2015). Before establishing the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE) in the 1990s, China's stock market was not an attractive finance option for private Chinese firms. The SZSE and SSE were established as an arm of the central government to solve the capital shortage problems of SOEs and sell shares to foreign investors, thereby raising the value of government stakes in these companies (Haung, 2016). Although relatively young compared to the stock markets of developed countries, China's stock market has become highly competitive in a short period and by 2016, the SSE had become the fourth-largest stock exchange globally and the biggest stock exchange in Asia (Carpenter et al., 2015; SSE, 2021).

[4] The big four banks in China are owned by the Chinese government. These banks are the Industrial and Commerical Bank of China (ICBC), the China Construction Bank (CCB), the Bank of Chinaa (BoC), the bank of Communications (BoCom), and the Agricultural Bank of China (ABC) (Brandt and Li, 2003).

The corporate bond market is integral to China's capital and financial market. According to Ding et al. (2015), China's bond market enables firms to issue bonds, thus increasing their debt ratio substantially (Fung et al., 2019). It is large, but bond market financing is still low in proportion to GDP (Xiaochuan, 2006). Relative to the scale of the Chinese economy, the national bond market was initially small and fragmented in its regulation and limited in the types of bonds traded (Qi, 2008). It has two main markets: the interbank (over-the-counter) bond market[5] and the exchange market, in which the interbank market plays the leading role. The first bonds were issued in China in 1986, but the corporate bond market only began to expand after the early 2000s when new insurance policies were implemented. In contrast to China's stock market, its bond market's development has lagged behind. The underdeveloped corporate bond market has distorted its financing structure, threatening its financial stability (Xiaochuan, 2006 Lin et al., 2020). Despite this, China's capital market as a whole has reached a development level that took numerous developed markets decades and even centuries to achieve (Qi, 2008).

2.2.2 The Evolution of China's Housing Market

The real estate industry in China has become a substantial contributor to the county's economy as residential properties are classified as both a consumer good and an investment asset (Xin, 2017). It is a comprehensive industry incorporating a range of economic activities in real estate, including construction, manufacturing, and renting. To become a primary contributor to China's economy, the real estate sector, particularly the urban housing market, has been subject to drastic policy reforms since 1949. Before the 1978 government housing reform, the government implemented policies that constituted nationalising private and allocating public housing through work units (danwei) under a central planning system (Man et al., 2011). Most urban lands were state-owned, and the government monopolised all land transactions. The government directly controlled the operation, allocation, production, financing, and housing pricing through the danwei. Housing was assigned mainly based on seniority, merit and need, and employees paid subsidised rent that was lower than the maintenance and construction costs (Wang and Marie, 1996; Wu, 1996). Private property rights were non-existent. Such policies resulted in low

[5] The interbank bond market was launched in 1997. It is a quote-driven over-the-counter (OTC) market outside the stock exchange in which deals made are based on bid and ask prices negotiated between two trading counter parties, most of which are institutional investors. The exchange bond market is order-driven market where bonds are traded alongside equities (Fung, 2019)

investment in the housing sector, a prolonged shortage of urban housing, inadequate quality and poor living conditions for most urban residents.

Since 1978, policies that have fostered China's transition from a centrally planned to a market-based economy have been introduced, and effective housing reforms have been at the forefront of the government's agenda (Man et al., 2011). These reforms began with the government restoring private property rights by returning seized and nationalised private housing and gradually increasing rent by encouraging house sharing. Since the 1980s, China's housing reform has gone through several stages. In the 1980s and early 1990, numerous commercialisation and privatisation projects that encouraged homeownership were implemented. Market liberalisation in the 1990s resulted in reforms and restructuring in almost all sectors, and multiple workers were laid off during privatisation. To compensate, a large amount of public rental housing was sold to employees in *danwei* at relatively low prices (Man et al., 2011).

The next stage occurred between 1993 and 1997 and introduced policies focused on restructuring construction activities, finance, management and distribution. The government encouraged housing market development for high-income households and subsidised the supply of commercial housing for middle and low-income families. During this period, the government also allowed the private sector to contribute to housing construction and development. As a result, the landscape of housing was changed from public goods and services as a part of the social welfare package enjoyed by employed urban residents to commodities and assets that were privately owned and provided mainly by the private sector, with rights to be traded on the market.

The booming housing market in China was initiated by State Council Document No.23, Notice of Further Deepening the Reform of Urban Housing System and Accelerating Construction, issued on 3 July 1998 (Liu and Ma, 2021). It restated policies introduced in earlier reforms, monetised housing provisions, stopped housing welfare distribution, and called for the socialisation and professionalisation of housing management (Liu ad Ma, 2012). This abolished the danwei housing system and launched cash subsidies for housing to newcomers entering the urban workforce. In August 1993, the Ministry of Construction issued a notice to promote further the reform of existing public housing, which stipulated that all public housing should be sold. The government supported low and middle-income families with subsidised and rental housing and ensured higher-income groups had access to mortgage financing (Wang and Murie, 2000). As

of 2019, more than 80% of homes in China were privately owned, evincing the successful privatisation policies of the 1980s and 1990s. China transitioned to a period of rapid growth in housing prices with an annual growth rate of 8% (Li and Qin, 2014; Wang et al., 2017).

As shown in Figure 2.1, the prices of residential properties have increased tremendously since 2001. The prices of commercialised residential buildings increased from ¥2,017 per square meter in 2001 to ¥9,287 in 2019. The prices of villas and high-grade apartments also appreciated considerably from ¥4,348 per square meter in 2001 to ¥17,886 in 2019. As a result, there was an expansion of the entire real estate market and a significant appreciation of residential and commercial property prices in China.

The real estate market has become a substantial part of China's economy and financial system through several mechanisms. Firstly, housing assets are an essential component of Chinese household portfolios partly due to the lack of other investment vehicles in China's underdeveloped financial markets (Liu and Xiong, 2017). Secondly, local government in China relies heavily on land sale revenues and frequently uses future revenue as collateral through the Land Government Financing Platform (Staikos and Xue, 2017). Third, firms also rely on real estate assets as collateral to pursue debt financing options and investments. Finally, banks are strongly exposed to real estate risk through loans made to households, real estate firms and local government (Liu and Xiong, 2017).

The housing market is closely linked to the land market (Du et al., 2017). In China, the government is the only land market, controlling the quantity, structure and timing of land supply (Zhang et al., 2013). The government introduced a market-oriented listing method in the early 2000s to promote transparency and enhance competition to enable developers to lease and acquire land (Zhang, 2012). Land sales are an essential source of revenue for local government, and Ahuja et al. (2010) indicated that land sales accounted for as much as 30% of government revenue in 2009. To obtain higher fiscal revenue to support local development, local government supports the housing industry and SOEs' fundraising capability due to their close connections with state-owned banks (Liu and Ma, 2021). This has increased land prices. These land reforms also created new opportunities for foreign capital to flow into China's real estate industry, further affording ample land-based revenues for the local government (Zhang et al., 2012). As a result, house and land prices increased dramatically after implementing these policies (Lui and Ma, 2021).

Figure 2.1 China's Real Estate Market Prices

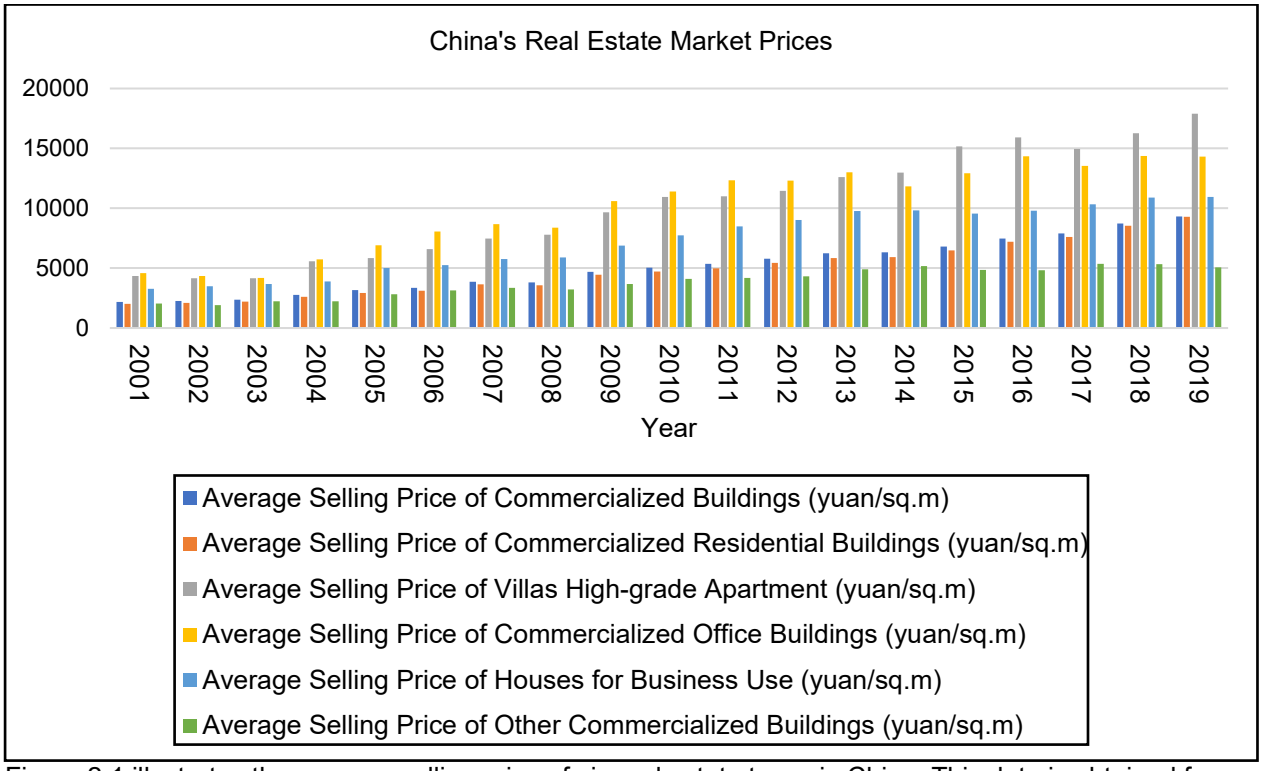


Figure 2.1 illustrates the average selling price of six real estate types in China. This data is obtained from the National Bureau of Statistics (2019). The unit is in Yuan / sq., and the data represent the time period from 2001 to 2019.

Over the past decade, the housing market has caused widespread concern for scholars and policymakers as the rapid increase in China's property prices represents an impending real estate bubble. Studies such as Cheng et al. (2014) and Zhang (2012) have argued that the potential risk of a bubble burst in the housing market prompted the Chinese government to consider strategies to contain the housing bubble. Additionally, behind the success of China's real estate industry and increasing housing prices, the country faces severe challenges in the emergence of marked regional differences in housing prices (Hui and Wen, 2015; Wang et al., 2017).

Figure 2.2 House Price in North and North-eastern Provinces

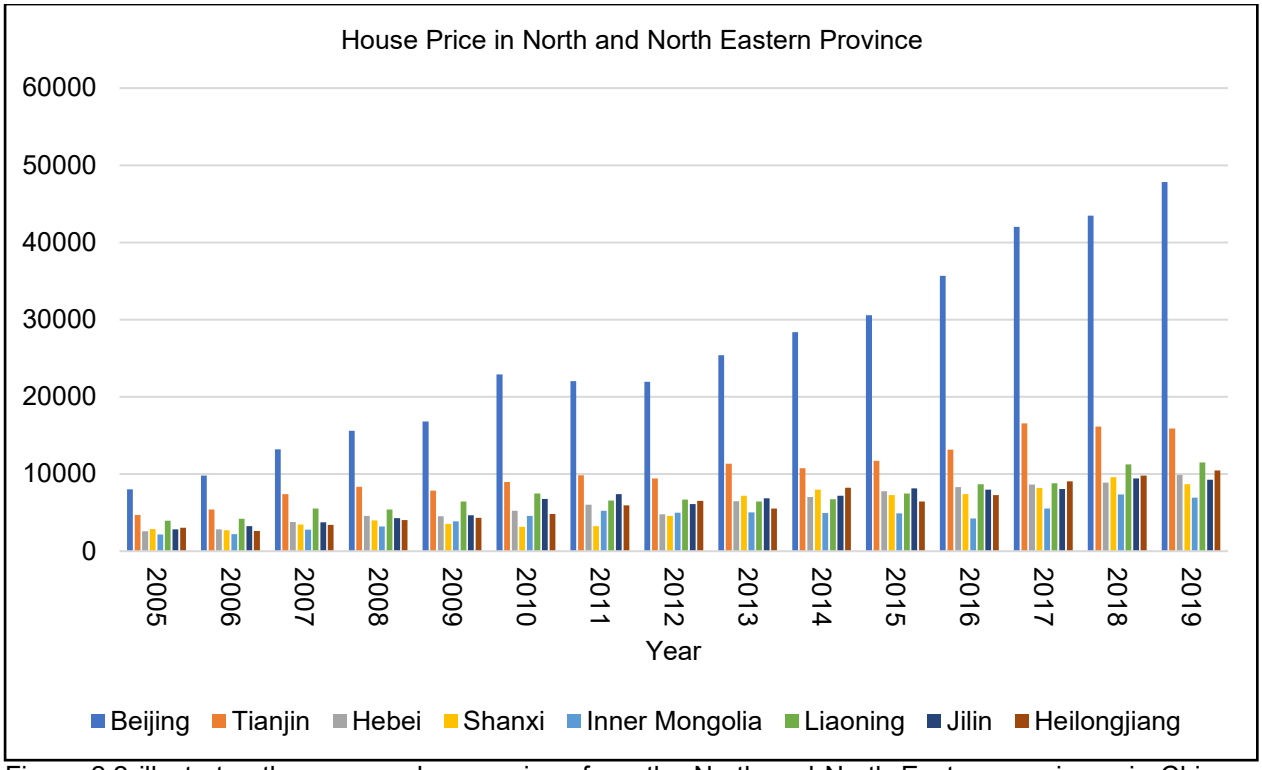


Figure 2.2 illustrates the average house prices from the North and North Eastern provinces in China. These provinces include Bejing, Tianjin, Hebei, Shanxi, Inner Mongolia, Liaoning, Jilin and Heilongjiang. This data is obtained from the National Bureau of Statistics (2019). The unit is in Yuan / sq., and the data represent the time period from 2005 to 2019.

Figures 2.2 to 2.4 show that provinces such as Beijing, Guangdong, and Shanghai have had the highest house price and house price growth over the years. First Tier cities such as Beijing, Shanghai, Guangzhou, and Shenzhen are located in the Beijing, Shanghai, and Guangdong provinces. Generally, the different cities are classified into tiers based on key characteristics, such as their economic development, infrastructure and cultural significance (Zhang et al., 2016).

Figure 2.3 House Prices in Southern Province

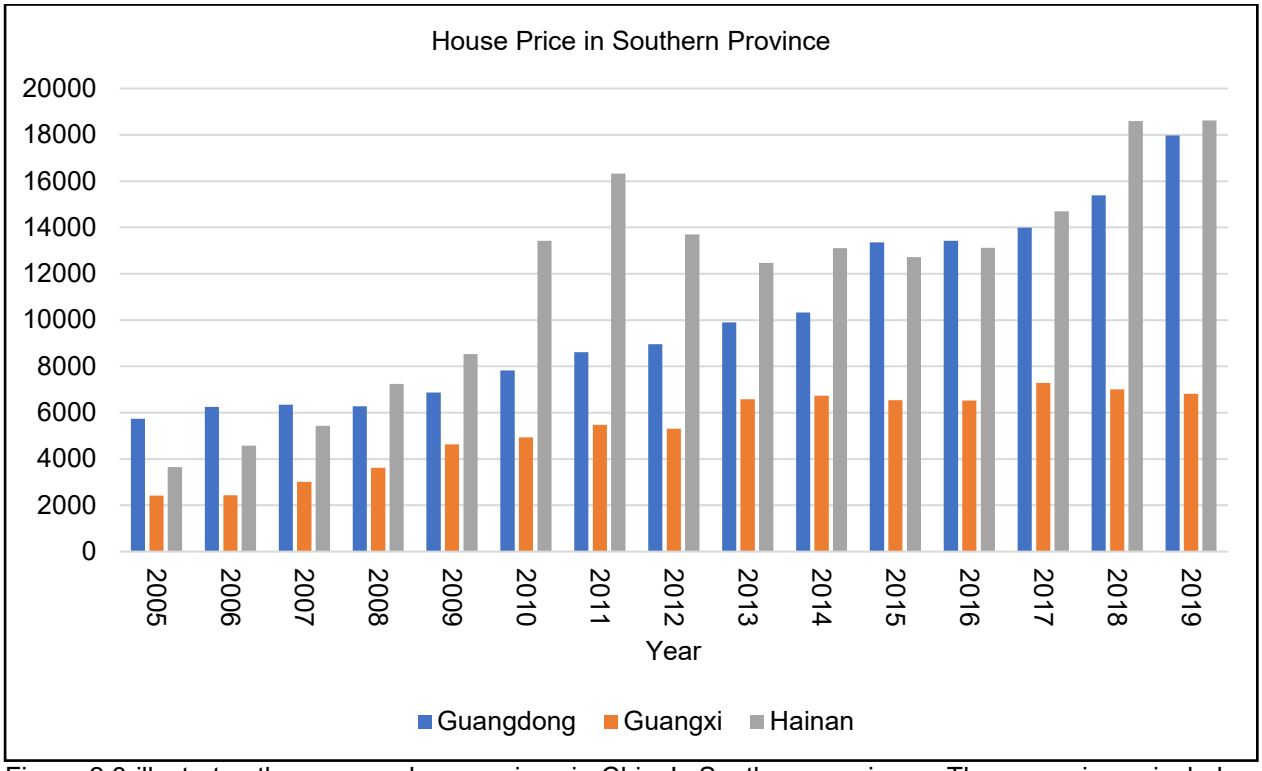


Figure 2.3 illustrates the average house prices in China's Southern provinces. These provinces include Guangdong, Guangxi and Hainan. This data is obtained from the National Bureau of Statistics (2019). The unit is in Yuan / sq., and the data represent the time period from 2005 to 2019.

First-tier cities are characterised by their constant influx of population and capital, aggressive purchasing needs, quality resource aggregation, higher GDP per capita and the real estate market being demand-driven (Wang et al., 2012). On the other hand, the housing market in second-tier cities such as Tianjin, Hangzhou, and Suzhou situated in Tianjin, Zhejiang, and Jiangsu provinces are not as strong as in first-tier cities (Yi et al., 2021). In line with this, Figures 2.2 and 2.4 show that these provinces have relatively lower house prices than the Beijing, Shanghai, and Guangdong provinces. However, it is essential to note that second-tier cities are characterised to have more opportunities for development and possess pillar industries of considerable influence and convenient transportation infrastructures (Zhang et al., 2016)

Figure 2.4 House Prices in Eastern Province

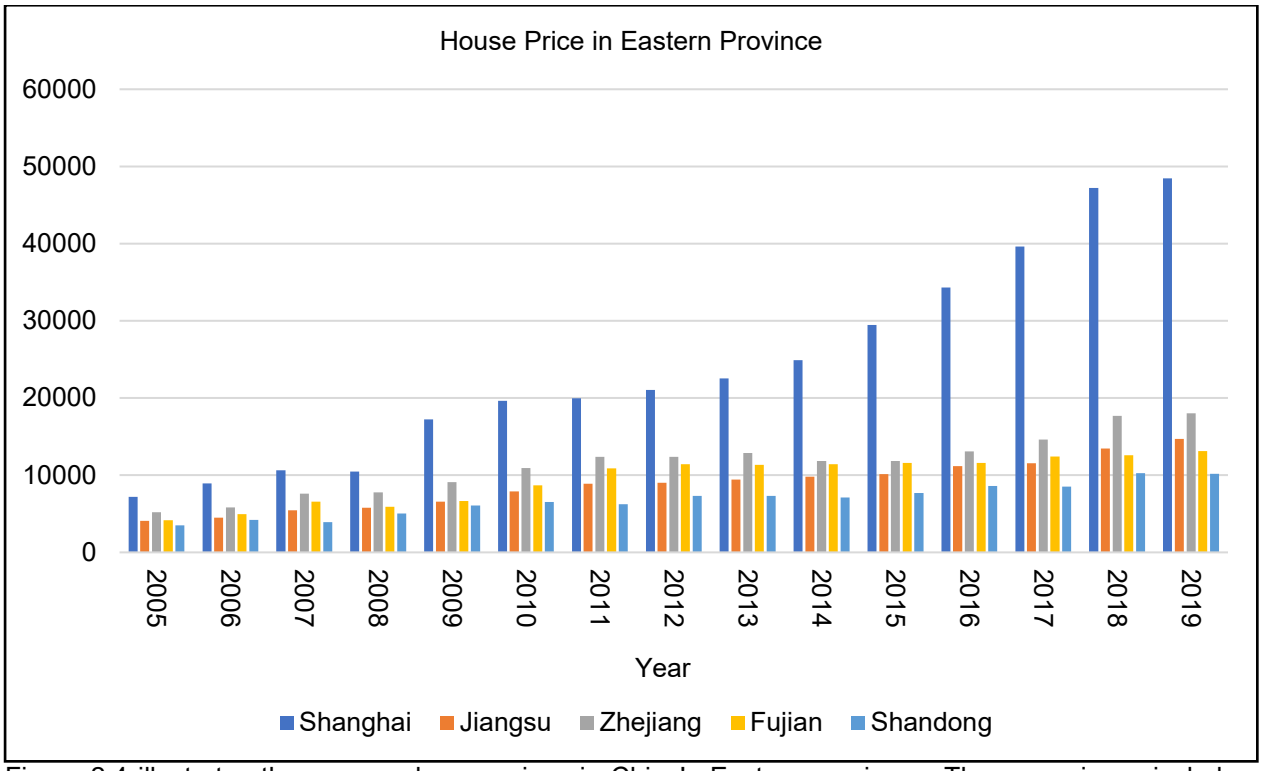


Figure 2.4 illustrates the average house prices in China's Eastern provinces. These provinces include Shanghai, Jiangsu, Zhejiang, Fujian, and Shandong. This data is obtained from the National Bureau of Statistics (2019). The unit is in Yuan / sq., and the data represent the time period from 2005 to 2019.

As a result, second-tier cities substantially benefit from China's urbanisation process, which contributes to its housing market. As for third-tier cities' housing market is small because of their population, usually less than 1 million. Meanwhile, economic development and market consumption in third-tier cities are lower than in first and second-tier cities.

Figure 2.5 House Price in Western Province

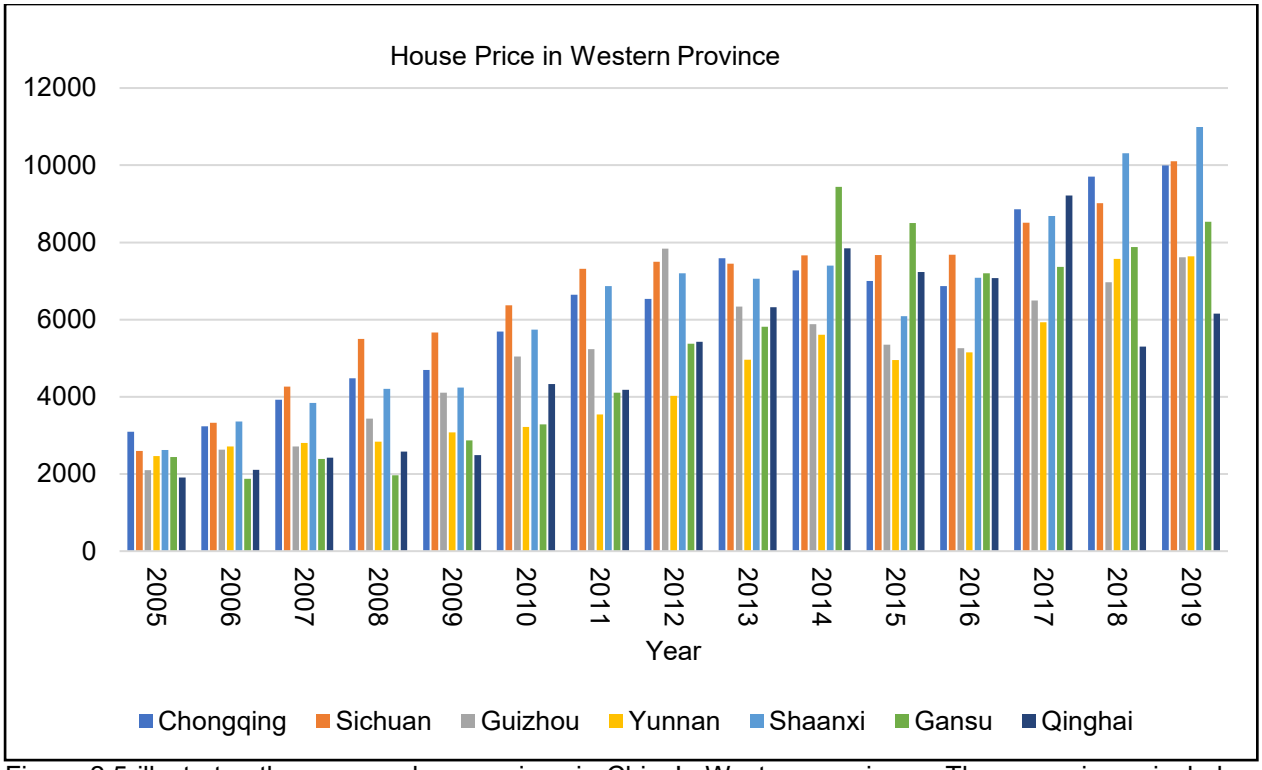


Figure 2.5 illustrates the average house prices in China's Western provinces. These provinces include Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai. This data is obtained from the National Bureau of Statistics (2019). The unit is in Yuan / sq., and the data represent the time period from 2005 to 2019.

Figure 2.6 House Price in Midland Province

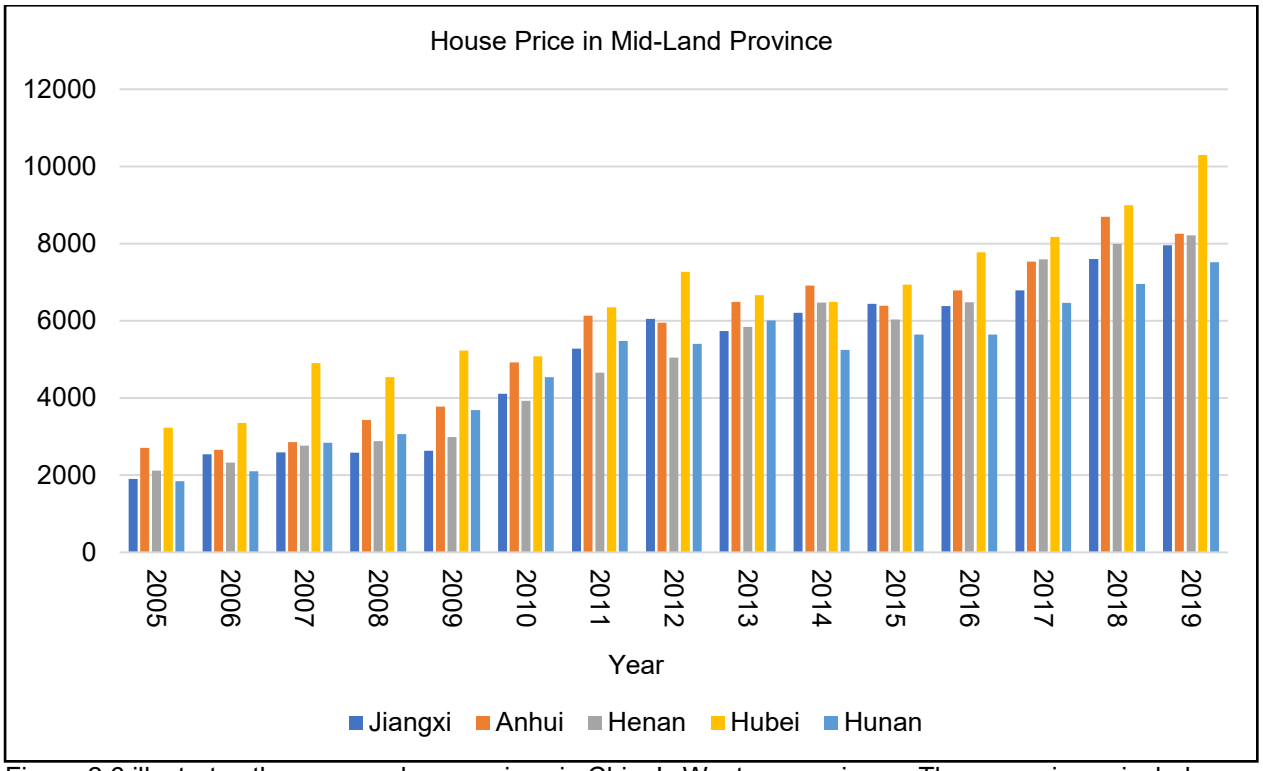


Figure 2.6 illustrates the average house prices in China's Western provinces. These provinces include Jiangxi, Anhui, Henan, Hubei, and Hunan. This data is obtained from the National Bureau of Statistics (2019). The unit is in Yuan / sq., and the data represent the time period from 2005 to 2019.

Along with provinces such as Beijing, Shanghai, and Guangdong, Figure 2.3 shows that the Hainan province has significantly high housing prices. The attractiveness of the Hainan housing market is possible because of the establishment of special economic zones (SEZ) in the province in 1988. Similar to Hainan, the Guangdong province has SEZs located in Shenzen, Shantou and Zhuhai. The establishment of SEZ facilitated the absorption of large amounts of FDI, aiding China to enhance its industrial productivity, improve its competitive advantage, generate employment and establish a dynamic economy (Buckley et al., 2007). Although numerous studies accentuate the positive effects of FDI on China's economic development (Cheung et al., 2006), this impressive performance of the Chinese economy camouflages unevenly distributed growth benefits (Azarhoushang et al., 2019). Large parts of China, particularly in the non-costal midland and western regions, have not entirely participated in the country's overall development. As a result, many low-income and poorly performing provinces in China are trapped by low economic progress.

The real estate industry accounts for China's second-largest FDI inflow after the manufacturing sector (Chinese Statistical Yearbook, 2020). However, not all the regions have benefited. Under the housing and land reforms, foreign investors can lease land; however, foreign investment location depends on the region's institutional and market advantages. He et al. (2011) suggest that the regional differences in housing and land commercialisation practices confer institutional benefits to some regions, thus attracting FDI. A higher share of market-allocated land indicates that it is generally easier for foreign investors to lease from the local government (He and Zhu, 2010). Therefore, regions with easier land access and transparent land leasing procedures attract more FDI (Lin, 2010).

Due to clustering effects, foreign investors tend to pursue opportunities in a few special economic regions of the host countries (Azarhoushang et al., 2019). The SEZ incentives and attractive investment environment of first- and second-tier cities attract FDI, further increasing regional disparity (Lessmann, 2013). The increased socio-economic and investment environment of first-tier cities and SEZs has enhanced the investment in real estate markets and housing demand in these areas. In contrast, the housing market is lagging in the non-costal midland and western regions. Concerns about the potential risk of a housing crisis and the regional housing price inequality prompted policymakers to take several actions to contain the issues. A clear shift in political priorities occurred in 2006 when the government adopted President Hu Jintao's harmonious society doctrine[6] (UNCTAD, 2019). Studies such as Chen et al. (2010) and Shi et al. (2016) indicate that initially, housing did not feature significantly in the doctrine of "harmonious society" in China's urban areas. However, the rapid upsurge in housing prices in most major Chinese cities since 2003 has made housing affordability one of China's top social issues (Chen et al., 2010). From January 2007 to August 2008, the Chinese government imposed a value-added tax on land transactions, raising the minimum down payment ratio and the minimum mortgage rate for the second mortgage to tackle the housing market issues (Liu and Ma, 2021).

However, the 2007 – 2009 global financial crisis interrupted the implementation of these restrictive measures. As the world economy declined, China's export-oriented industries were adversely affected (Ma, 2010). As a result, the Chinese government initiated a four trillion Chinese Yuan (CYN) stimulus package to inhibit the economy from further decline and revoked

[6] The Harmonious Society doctrine is a socio-economic and political concept that was introduced in China in 2005. It aims to create a peaceful, stable, and prosperous society by promoting social equality, justice, and harmony. The concept emphasizes the need for balanced economic development, improved social welfare, and enhanced social cohesion in China.

the prior restrictive policies. (Liu and Ma, 2021). Although from October 2008 to May 2009, the government implemented policies to stimulate house investment and purchases. House prices recovered in the third quarter of 2009 and resumed their fast-rising trend. By the fourth quarter of 2009, Chinese house prices reached a historical high. The most dramatic tightening measures were introduced in April 2010 and were centred mainly on administrative matters (Zhang et al., 2012). One of these is the restriction on purchasing second and third apartments by a single household[7]. Also, in April 2010, the government issued the "Notice of the State Council on Resolutely Curbing the Soaring of Housing Prices in Some Cities". To this effect, China announced an increase in the down payments required on second homes to 50% from 40%[8].

The government imposed that the banks begin charging a minimum mortgage rate of 1.1 times the benchmark interest rate on second homes and increase down payments on first homes larger than 90 square meters from 20% to 30%. In January 2011, the Chinese government increased the minimum down payment for second mortgages to 60%. Some cities, including Beijing, put new restrictions on home purchases by non-residents. More tightening measures involving tax and land restrictions were enacted during the same year. In 2017, the government implemented a sales restriction policy to curtail speculation on house prices (Yan, 2017). This involved restricting the transfer period after obtaining a real estate certificate from 2 to 10 years (Lyu and Bu, 2018) and implementing a price restriction policy. This was the most direct policy to curb house prices. The government-imposed restrictions on real estate developers to decrease the housing price from the supply side (Lyu and Bu, 2018).

Over the past four decades, but especially since 1998, China's housing policy has moved away from a traditional welfare orientation to a monetised allocation system through a cycle of policy reforms with distinctive Chinese characteristics such as strict control by the government of land supply, mortgage rates and deposits. With the policy goal of establishing a lucrative real estate industry and ensuring homeownership is affordable for the average household, much of the literature indicates that there have been unintended consequences of these reforms. According to Chen (2020), these reforms have been accompanied by soaring land and house prices, high vacancy rates and high price income and price-to-rent ratios indicative of a housing crisis. He et

[7] This is a purchase restriction policy that the Chinese government implemented to reduce the demand of housing by directly restricting the number of houses that can be purchased (Lyu and Bu, 2018)
[8] This loan restriction policy was one of many policies aimed at reducing the demand in the housing market (Lyu and Bu, 2018)

al. (2001), Kuang et al. (2011), Guest and Rohde (2017) and Guvercin and Gok (2021) have all emphasised the role of FDI in China's housing market dilemma.

The majority of the literature has focussed on how FDI affects housing prices from a national perspective. However, FDI disparity and real estate market segmentation have been embedded in China's economy for a long time. Thus, it is not sufficient the explore the effect of FDI on China's housing market nationally, as the economic environment and real estate market in China's provinces are quite different.

CHAPTER 3 SECTORIAL DETERMINANTS OF OUTWARD FDI RELATIVE TO INWARD FDI.

3.1 Introduction

The increased significance of FDI and its contribution to globalisation, market integration and economic growth is accompanied by a plethora of research focusing on the factors that attract FDI in both developed and developing economies (Paul and Singh, 2017). A substantial amount of FDI literature has been focused on IFDI determinants. Chakrabarti (2003), Asiedu (2002), Bergstrand and Egger (2007) and Blonigen (2011) have identified macroeconomic factors such as trade openness, market size, economic growth, capital, labour, technology, and political and financial institutions as significant drivers of IFDI. Other studies have focused on its relationship and effect on economic growth. De Mello (1997), Borensztein, De Gregorio and Lee (1998), Blomstrom and Kokko (1997), Crespo and Fontoura (2007), Gorg and Strobl (2001) and Lim (2001) have evinced a positive relationship between IFDI and economic growth. The Chinese government believed IFDI could contribute to its economic expansion and thus promoted policies that resulted in a substantial inflow of IFDI. As a result, FDI inflow in China has expanded from $10.172 billion in 1970 to $1.48 trillion in 2000, $1.889 trillion in 2010 and $2.651 trillion in 2015 (UNCTAD, 2019). China's trade liberalisation policies in the late 1970s made the country the primary location of FDI for MNEs from developed economies.

During the initial stages of the 1979 Equity Joint Venture reform, the majority of IFDI was export-oriented, as MNEs were attracted by China's labour endowment and relocated their production bases to China. However, from the early 2000s, export products were not limited to labour-intensive goods but also a wide range of capital-intensive and sophisticated products. According to Dunning and Narula (1996), export activities encourage economic development and significant transmission effects as domestic investors learn from IFDI and discover numerous productive and lucrative exportable activities. As a result, more investors are attracted to China, and as China's sectors and suppliers have expanded, the country's resources have transferred from lower to higher productivity activities. This growth is driven by differential productivity across sectors, and structural change through IFDI lies at the foundation of China's economic transformation.

Although China has had considerable success in IFDI, OFDI from China used to be relatively small. The Chinese government identified a possible expansion plan to facilitate the country's

economic growth further and made a strategic decision in the late 1990s that established the pivotal targets in the 10th Five-Year Plan. These targets focused on redefining and upgrading the industry and strengthening global competitiveness (Wei, 2010). The implementation of the Go Abroad policy, which is part of the plan to improve the core competencies of domestic enterprises, was proposed. The policy encouraged Chinese firms to invest internationally. Its implementation was the beginning of a strategic push to promote economic growth through the internationalisation of Chinese firms to become MNEs. In 2001, Chinese OFDI increased by $6.8 billion compared to its negligible outflow during the 1970s to 1990s (UNCTAD, 2018). In 2008, Chinese OFDI reached $55.9 billion, equalling China's 2003 IFDI of $53.5 billion (UNCTAD, 2018). In 2010, Chinese OFDI was $68.8 billion, more than double the 2007 Figure of $26.5 billion (UNCTAD, 2019). The growth rate and share of OFDI relative to IFDI have increased substantially during the last decade, so much so that OFDI stood at $145 billion in 2015 compared to its IFDI of $135.6 billion the same year (UNCTAD, 2019) and the number of Chinese MNEs increased to 24,000. This increased momentum of China's investment outflow is attributed to the implementation of the Go Abroad policy and China's macroeconomic conditions.

Before the emergence of MNEs from developing economies like the BRIC (Brazil, Russia, India, and China) countries, the research on FDI was uni-directional, from highly advanced countries to less or equally developed host countries (Borensztein et al., 1998; Carkovic and Levine, 2005; Balasubramanyam et al., 1996; Barell and Pain, 1997). However, the increased internationalisation of MNE from developing countries brought a new perspective to the study of FDI. Tolentino (2008), Kolstad and Wig (2012), Lee et al. (2016), and Ibrahim et al. (2019) have studied the determinants of OFDI, while Buckley et al. (2007), Heizer (2008, 2010), Behbehani and Hallaq (2013), Knoerich (2014) and Ali et al. (2018) have focused on the relationship between OFDI and economic growth in developing countries.

Given the trend in FDI and economic development in countries like China, it would appear that IFDI and OFDI play an interactive role in an economy. Further, given the remarkable growth in China's economy, which seems to coincide with the growth in OFDI/IFDI, it would also seem that the notion presented by the IDP theory, Dunning and Narula (1996), Figure 1.1, that countries tend to transition to more advanced stages of economic development as OFDI/IFDI increases. As discussed in Section 1.1, the different phases of economic development of a country are categorised according to their ability to pursue IFDI and then transition to outward foreign investors. Duran and Ubeda (2005), Dunning and Narula (1996) and Narula and Guimon (2010) all indicate that a country that shows the ability to become an outward investor advance to a

higher degree of economic development depending on specific macroeconomic determinants and advantages obtained from earlier IFDI activities. As evinced in China, initially, IFDI was considerably higher than OFDI, which was apparent before implementing the Go Abroad policy. However, because of changes to China's macroeconomic environment and the restructuring of its economy, the share of OFDI relative to IFDI increased substantially. Understanding this is critically important from the perspective of the IDP theory as it would provide insights into what less developed and developing countries can do to reach a higher level of prosperity. Analysing the determinants of OFDI/IFDI is a challenging task as there are not many countries in the earlier stages of development that have attained a significant amount of OFDI. China is one of the few exceptions. Although its OFDI only surpassed its IFDI temporarily in the year 2000, in a number of its sectors, OFDI surpassed its IFDI and maintained that tendency. Thus, sectoral-level IFDI and OFDI-level data from China provide a unique opportunity to investigate the determinants of OFDI relative to IFDI. This is precisely where this chapter aims to contribute. To the best of my knowledge, the handful of studies that explore the determinants of OFDI/IFDI is Dunning and Narula, 1992; Wei et al. 2013; Durhan and Udeba, 2005. None of them uses sectoral-level data. These studies were conducted using aggregate IFDI and OFDI data for developing economies, including China and found that variables such as technological capability, exchange rate and trade are predictors of the share of OFDI/FDI.

3.2 Literature review

IFDI enables economic growth and firm-specific resources of the host developing countries through the transmission effect of more advanced technology (Barthelemy and Demurger, 2000; De Mello, 1997); knowledge transfer enables human capital formation (De Mello and Sinclair, 1995) and the promotion of exports in capital-intensive industries (Todo, 2003) by MNEs from advanced economies. The OLI paradigm (Dunning 1977) argues that macroeconomic factors are classified as (L) location-based advantages that determine an MNE's decision to invest in a particular host country. Chakrabarti (2001), Blongien and Piger (2011) and Villaverde and Maza (2015) identify that these factors are market size, economic growth, exchange rate, trade openness, labour, human capital, wage cost, technology, capital, the political and economic climate. Zhang and Daly (2011) argue that the IFDI increase since the 1980s has been due to the improvement of the macroeconomic environment and the impressive growth of the Chinese

economy. Before this, foreign investors were reluctant to invest in China because of its centrally planned economy, which brought higher risk (Dees, 1998).

In relation to the growth-enhancing properties of IFDI, these macroeconomic determinants also serve as absorptive capabilities that a recipient country needs for IFDI to contribute to economic growth (Asiedu, 2002). The key determinants are the availability of human capital (Bengoa and Sanhez-Robles, 2003), adequate technological capabilities (Nelson and Phelps, 1966; Glass and Saggi, 1998), efficient political institutions (Asiedu, 2002), financial development (Alfaro et al., 2010) and trade openness (Pradhan, 2011). Given sufficient absorptive capacity in the host economies, newly transferred technology, knowledge, and capital inflow from foreign MNE promote the domestic company's ownership advantage (Dunning and Narula, 1996). This enables it to compete with foreign MNE in its host country and seek outward investment opportunities in the global market (Zhang, 2001; Wei et al., 1999). According to Dunning and Narula (1996), China engaged in OFDI to enhance the development of local sectors. Economically developing countries such as the BRIC nations are regarded as home economies to MNEs that engage in substantial OFDI (UNCTAD, 2012). However, these countries were previously predominantly perceived as destinations and recipients of IFDI.

A variety of factors account for the growing Chinese OFDI and its global economic impact. These include firm-level elements characterised as specific ownership advantages: organisation, management, and technological know-how (Wei et al., 1999). Macroeconomic elements that foster location advantages are also crucial to China's OFDI success. As a host country, these factors focus on location advantages, including market characteristics, natural resources, and comparative advantages (Asiedu, 2020). Home country factors such as institutional environment (Lee et al., 2020), capital market imperfections (Buckley et a., 2007), exchange rates (Liu and Deseatnicov, 2016), trade openness and level of economic development (Dunning and Narula, 1996) foster OFDI.

Based on the investment development path (IDP) theory, IFDI contributes to enhancing firm-level ownership advantages and engenders specific home country macroeconomic variables, such as exports, capital availability, technology and political and economic creditworthiness. In time, these firm-level and home-country factors bolster the ability of developing countries to pursue OFDI opportunities. China has achieved this and thus generated a significant degree of OFDI despite being a primary inward foreign investment recipient (UNCTAD, 2014). It has enabled China to gain an economic advantage over other developing countries and enhanced

its ability to compete with developed economies (Das and Banik, 2015). Other developing countries have not harnessed their home country's advantages to generate a more significant share of OFDI over IFDI in the economy. By incorporating Dunning and Narula's (1996) IDP theory, the eclectic paradigm and various other underpinnings of FDI literature, this study examines the mechanism through which China's OFDI increases relative to IFDI through its interaction with various home country factors.

Alongside China's foreign investment position and economic development, much literature has emerged examining the determinant of Chinese FDI. Using a pooled ordinary least square method, Zheng (2010) employed a panel dataset at the provincial level to study the determinants of IFDI in China. Dess (1988) investigated the economic factors that attract IFDI in the western areas of China. Concerning OFDI, Buckley et al. (2007) perform a pooled ordinary least square and random effect generalised least squares on annual national-level Chinese data to study the determinants of Chinese OFDI. Zhang and Daly (2011), Yoa et al. (2017) and Iqbal et al. (2019) perform a panel data analysis to study the determinant and motives for outward Chinese investment in the host countries. Specifically, Iqbal et al. (2019) apply a panel data estimation technique to determine the extent to which the macroeconomic determinant of 27 host countries attracts outward foreign investment from China. The study adopts OFDI stock as the dependent variable and each of the host country's domestic credit, consumer inflation, corruption, political stability, infrastructure, and geographic distance China's exports to and import from the destination countries as the explanatory variables. The result of the study reveals that inflation rate, export, import, corruption, infrastructure, and geographic distance are significant determinants of China's investment in Asia. Although Iqbal et al. (2017) study the determinants of OFDI using a panel estimation method, the first empirical chapter of the thesis deviates from Iqbal et al. (2019) as it focuses predominantly on China and explores the home country's macroeconomic factors that impact its outward foreign direct investment position. Iqbal et al. (2019) mode of exploring the OFDI in relation to emerging economies has been conducted in a number of studies. For example, Buckley (2009) identifies different determinants and motivations of FDI in different regions, Duanmu and Guney (2009) use a set of unbalanced data and finds that China and India's OFDI are attracted to countries with larger market size, low GDP growth, high volume of import from China and India, and low corporate tax rates.

Additionally, I extend Iqbal et al. (2017) by not solely considering OFDI stock, as traditionally and extensively adopted as the dependent variable in the existing literature. I take a different approach by adopting the share of OFDI relative to IFDI as the dependent variable. By so doing,

I investigate the extent to which China's home country determinants impact the increasing share of OFDI relative to IFDI. Also, Iqbal et al. (2017) do not account for the sectorial differences in terms of OFDI and the explanatory variable. I extend Iqbal et al. (2017) by accounting for the possible heterogeneity that is present in the sector-level data. To incorporate both inward and outward FDI. Narula (2010) studies the determinants of both using panel data from 40 developing countries to analyse the relationship between them and country-specific characteristics from 1958 to 1988. Based on a review of the literature, it can be stated that research that integrates both inward and outward FDI is lacking, especially in the context of China's economy.

While the literature identifies various determinants that contribute to a county's inward and outward FDI, these factors' effects on the different sectors are far from homogenous. Ho (2004) performed an empirical analysis of the determinants of Chinese IFDI on pooled data from 13 industries from 1997 to 2002. Yakubu and Mikhail (2019) use sector data to study the factors determining IFDI in Ghana. They argue that the determinants of FDI differ across sectors. The share of FDI in terms of the amount attracted, used and generated across the sectors in China is not evenly distributed (Knoerich, 2014). With increasing inflow and outflow to and from China, China's industrial structure has changed dramatically over the past five decades. Knoerich (2014) argues that China has successfully attracted IFDI and generated OFDI since the Equity Joint Venture Law in 1979, the emergence of the Going-Global strategy in 1999 and China's accession to the World Trade Organisation (WTO). However, foreign investments are not centred equally across the sectors, and their distribution and contribution remain unbalanced (Wei et al., 2013).

As in many developing countries, FDI in China is mainly concentrated in secondary industries, especially manufacturing. The sectorial structure of Chinese FDI has changed over time (Coughlin and Segev, 1999). In 1984, the primary agriculture industry, mining and petroleum were the most important in China's economy (Broadman and Sun, 1997). However, the significance of these sectors steadily diminished, accounting for only 3.1% of FDI in China in 1993, compared to 40.9% in 1984. By 1993, the manufacturing sector accounted for roughly half of the Chinese IFDI (UNCTAD, 2012). UNCTAD (2017) also indicate that the manufacturing sector contributes to most of China's OFDI. However, during the 2010s, the FDI sectorial distribution changed significantly as the share of manufacturing declined, and that of the service, retail and technology-based sectors increased (Knoerich, 2014).

Although there is a clear justification for the importance of sector analysis in this field of research, sector-based analysis on both inward and outward FDI in China is limited. Therefore this chapter will contribute to the literature by providing a sectoral-level analysis. Moreover, as my aim is to understand how less developed countries and developing countries can reach a higher level of economic prosperity by increasing their share of OFDI in relation to IFDI, as predicted by the IDP theory, there are not many countries have been able to achieve a significant amount of OFDI in relation to IFDI. China is one of the few exceptions. In the year 2000, its OFDI exceeded its IFDI but then returned to a lower level. However, there are many sectors in China where OFDI has exceeded IFDI and maintained that tendency. Such trends in the sectoral data provide me with a unique opportunity to explore the drivers of OFDI/IFDI at a sectoral level.

3.2.1 Theoretical Literature of Foreign Direct Investment

Given that many different variables have been employed in the literature to explain the determinants of IFDI and OFDI, I will now perform a detailed analysis of the existing theoretical literature on FDI that will aid in setting up my empirical model and my hypotheses.

FDI is an important research topic in international business literature. The changes in global business due to globalisation, market integration and economic reform have spawned a myriad of theoretical and empirical research to generate theories that explain the trends, motives and phenomena of FDI. They also explain why some countries are more successful than others in attracting IFDI and generating OFDI (Moosa, 2002). In China, several theories provide a foundation of knowledge of the country's FDI. Because China's FDI presents many special conditions rarely encountered in a single country, understanding theoretical and empirical works is crucial (Buckley et al., 2007). The theoretical underpinnings that will be discussed in this chapter include the eclectic paradigm (Dunning, 1980), institutional-based views (Wilhems and Winter, 1998) and the capital market theory (Aliber, 1970). The IDP theory (Dunning, 1980, 1981), discussed in Chapter 1, is also relevant for FDI, and we will revisit it briefly.

3.2.1.1 The Eclectic (OLI) Paradigm

Developed by Dunning (1980), the eclectic or OLI paradigm is an integration of international trade, imperfect market and internationalisation theories. Much of the existing international business literature uses the paradigm to conceptualise the determinants of FDI. The approach

offers a framework that categorises both micro and macro-level determinants of FDI to understand the motivation and location of MNE internationalisation. According to Dunning (1980, 1996), three elements determine a country's ability to attract inward and generate outward FDI. These are ownership advantages (O), location advantages (L) and internalisation advantages (I). Rugman (2010) believes the OLI paradigm explains the factors driving FDI. Dunning (1980) explains that MNEs develop competitive ownership advantages in their home countries and exploit them abroad when they internationalise. These include property rights, intangible assets, financial assets, core competencies and institutional assets.

Internalisation advantages are based on a firm's ability to coordinate internal functions to replace market mechanisms (Dunning, 1996). Internalisation also explains that there must be a benefit from international expansion for the firm. Internalisation advantages are established when the firm's assets (ownership advantages) cannot easily be replicated. Location-specific factors indicate the benefits of factor endowments and macroeconomic factors of the host and home countries, which enhance the firm's capabilities (Rugman, 2010). These location-based advantages in home countries are regarded as macroeconomic factors that amplify favourable investment conditions and thus enable domestic firms to internationalise. Wei et al. (2010) indicate that these are categorised as home-country determinants of OFDI.

Romer (1990) argues that positive externalities associated with human capital and technology prevent an economy's marginal product of capital from failing. He suggests that IFDI enables productivity through capital inflow, knowledge spillover and technology transfer from foreign MNE to recipient countries (Romer, 1990). The potential development benefits of IFDI resulted in the Chinese government implementing trade-liberalising policies to improve its investment climate and attract FDI. Wei and Alon (2010) argue that the sharp rise of IFDI since the 1980s has been because of improvements in location-specific factors and the rapid growth of China's economy. Before the 1970s, China was not regarded as a good investment destination. Its ability to attract FDI according to the eclectic paradigm depends on its location-based factors (L), which include tax incentives and technological capability. This is coupled with the exchange rate (Wolff, 2007), human capital (Dunning, 1996), trade openness, efficient institutions and policies (Acemoglu and Johnson, 2005), and adequate infrastructure (Castro et al., 2007). For example, implementing the Corporate Income Tax Law and establishing SEZs contributed to the tax incentives that have attracted foreign MNE to China. The 1979 trade policy and other trade liberalisation policies that followed, coupled with China's dual exchange rate regime, also contributed to its location-based advantages.

By successfully attracting FDI, China was able to use the positive spillover and capital inflow to pursue industrial and economic restructuring and economic growth. According to Asongu et al. (2018), countries like China have encouraged IFDI, especially in sectors that have significant multiplier effects on employment and output, promotion of technology transfer and local innovation. The firm-specific ownership advantages of foreign MNE were assimilated into China's industrial structure, and domestic Chinese firms began to acquire competitive advantages and compete in the same sector (Dunning and Narula, 1996), thus enabling the ownership advantage of domestic firms (Dunning and Narula, 1996; Apergis, 2009; Dunning et al., 2001). These include an increase in financial capability (Alafro et al., 2004), enhanced human capital stock and technological capability (Branstetter, 2005). The development of these ownership advantages enables domestic firms to pursue outward investment opportunities such as exports, greenfield FDI and joint ventures (Dunning and Narula, 1996).

Another theory that fulfils the ownership advantage aspect of the eclectic paradigm is the resource-based view. According to Barney (1991), the resource-based view holds that valuable, rare, imperfectly imitable and imperfectly substitutable resources are a company's primary source of competitive advantage. Wang et al. (2012) argue that the resource-based view classifies outward investment as a channel by which MNE can rent internationally by exploring and exploiting their firm-specific resources or ownership advantages, such as technological capabilities, brand names and scientific knowledge. The ownership advantages possessed by the MNE can be deployed into many international markets, enabling companies to balance cost and risk incurred overseas (Tseng et al., 2007) and obtain economies of scope, scale and production rationalisation (Hitt et al., 1997).

The location-based component of the eclectic paradigm also describes the home country's macroeconomic determinants that increase the utility of OFDI. Although the development of the ownership advantages of Chinese firms resulted in the emergence and growth of Chinese OFDI (Dunning and Narula, 1996), the enhanced macroeconomic condition of the Chinese economy also contributed significantly. As a result of the promotion of foreign investment in China, the foreign capital inflow enabled the capital and financial buoyancy of the economy, and the technological and knowledge capability enriched various Chinese sectors in terms of innovation and human capital development. The contribution of IFDI to China's GDP also enhanced the country's economic growth. Capital availability and technological capability are significant determinants that contribute to OFDI.

Wang et al. (2012) combine resource and institutional-based views and argue that government involvement in an MNE is a form of ownership advantage. Wang et al. (2012) believe this applies to Chinese SOEs and private Chinese MNEs. The implementation of the 1979 open-door policy, the establishment of the special incentive zones in the 1980s and 1990s, the 1999 Go Abroad policy, the 2001 WTO agreement and China's transition to a floating exchange rate regime in 2009 were government policies that were enacted to enable the internationalisation of its domestic sectors. These policies highlight trade openness (Kyrkillis and Pantelidis, 2003) and exchange rate appreciation (Aliber, 1970: Chen 2018) as home country determinants that enhanced the ability of Chinese firms to internationalise. The predominance of SOEs and the Chinese government's motive for improving OFDI encourage the government to make affordable lines of credit and finance available for Chinese MNEs seeking to internationalise (Tolentino, 2008). This involves Chinese banks, primarily state-owned, giving out loans to Chinese MNE at low-interest rates (Wei et al., 2010). According to Tolentino (2008), the low-interest rate made available by the Chinese SOE banks is indicative of the country's capital formation. This ability to raise capital at preferential rates is translated into ownership advantages in China's MNEs. In support of this, Di Giovanni (2005) and (Erel et al., 2012) argue that home country finance opportunities and financial development have positively affected cross-border mergers and acquisitions.

3.2.1.2 The Investment Development Path

From the perspective of a macroeconomic framework, FDI theory was first put forward by Hymer (1960). Prior to Hymer, FDI was explained within the traditional theory of international capital movement. Similar to other types of international investment, FDI is regarded as a response to differences in the rates of return on capital between economies. The study reinforced this notion that American companies (a significant source of FDI in the 1950s) received a higher rate of return from their investments than domestic enterprises (Agarwal, 1980). Hymer (1960) was the first to point out the preceding theories' faults. According to Hymer, the differential rate of return hypothesis was not consistent with the several observed characteristics of foreign investment. Firstly, the Unites States combined net outflows of FDI with net portfolio capital inflows. Secondly, FDI in both directions between two countries is not uncommon. This suggestion feeds into the observation that developing countries in Africa and Asia, which were solely recipients of FDI from developed countries, have begun to generate international investment directly to North

American and European economies. Thirdly, many subsidiaries complemented the FDI inflow with capital borrowed in the local market. Lastly, manufacturing firms were at the time far more significant in terms of international investment than financial companies.

Moreover, an international distinction in expected return is not enough to induce FDI (Caves, 1982). Under perfect markets, an increase in the short-run profits of firms in one country would not facilitate international investment (Kindleberger, 1969). Instead, it would attract new entrants that would eliminate any excess profits. Hymer (1960) indicates that FDI involves the transfer of not just capital but technological know-how and management skills. This transfer of know-how and capability through FDI to host countries enhances the sectors' capabilities in these recipient economies, thereby enhancing the ownership advantages and enabling them to compete with foreign companies and generate outward investment. A strategy that emerging economies like China adopted. This feeds into the premise of the investment development path theory. The IDP traces out the net cross-border flows of industrial knowledge, the flows internalised in FDI, and the restructure and upgrade of the global economy. Although, there is also the non-equity type of knowledge transfer, such as licensing and turn-key operations (Dunning, 1996). In this way, the IDP can thus be viewed as a cross-border learning curve exhibited by a nation that successfully moves up the stages of development by acquiring industrial knowledge from its more advanced 'neighbours'. A more detailed explanation of the IDP theory is discussed in Chapter 1.

3.2.1.3 Capital Market Imperfection

According to Buckley et al. (2007), capital market imperfection in emerging countries such as China requires a unique application of the general theory. The concept of imperfection may mean that capital is available at below-market rates for a considerable period, creating a disequilibrium that potential outward investors can exploit. The assumption of capital market imperfection to FDI is that, as a result of expensive sources of finance in home countries relative to a firm's internal cost, MNEs pursue investment opportunities in host countries that have a depreciated exchange rate relative to their own (Phillips and Ahmadi- Esfahani, 2008). Investment in the host country becomes cheaper for the foreign MNE. China used the exchange rate as a means to increase its competitiveness in attracting FDI. From the late 1980s to the implementation of the 2005 flexible exchange rate policy, the Chinese Yuan was considerably devalued because of the transition of China's exchange rate regime from the dual exchange rate regime to a unified

single exchange rate system (Phillips and Ahmadi- Esfahani, 2008). This devaluation of China's currency contributed to the inflow of FDI.

FDI in China is export-oriented. Yao (2006) argues that an export promotion policy was pursued with several reforms, including liberalisation of the foreign exchange market, IFDI promotion and industrial restructuring to exploit China's advantage in international markets. According to the China Statistics Yearbook (2002), in 2001, foreign investment firms in China exported $133 billion, more than 50% of China's total exports. However, after the 2001 WTO agreement, China transitioned to a flexible exchange rate regime which led to the appreciation of its exchange rate. In addition, the increased value of the Chinese Renminbi (RMB) further enhanced domestic Chinese firms' ownership and location advantages as the source of financing in China became cheaper relative to the firm's internal cost. From this, it is possible that China's ability to internationalise easily can be attributed to the capital imperfections that exist in the economy in government involvement in manipulating and exploiting its exchange rate advantages.

3.2.1.4 Institutional-Based Theory

The institutional element contributes to the ability of domestic firms to invest abroad. Through the efficient implementation of effective and liberal policies for OFDI promotion, China has been able to enhance the multinationality of Chinese firms. There is an immense body of theoretical and empirical literature on institutional theory, which aids in explaining the particularity of the behaviour of Chinese OFDI (North, 1990; Wright et al., 205; Peng, 2002; Acemoglu et al., 2002). The basis of this theoretical contribution is that the home country's institutional environment affects a firm's strategy (North, 2002); these can be formally or informally imposed by the government (Scotts, 2002). Chinese firms enjoy a high level of government support, as discussed in Chapter 2, typically through privileged access to cheap capital, favourable exchange rate regimes and interest rates, soft loans, subsidies, and financial flexibility. These home-country advantages have also enabled Chinese firms to offset ownership and location disadvantages abroad (Buckley et al., 2007; Dunning and Narula, 1996; Dunning, 1980). Elements of the institution-based theory regarding the role of government in involvement can be applied to the IDP paradigm to explain the FDI position of emerging economies.

3.2.1.4.1 The Role of Government in Influencing FDI Position

According to the IDP paradigm (Chapter 1, pages 18 to 23), the role of government in Stages 2 and 3 is to establish incentives to attract more IFDI to high-tech and innovative sectors to boost productivity. The government also encourages domestic firms to invest internationally to enhance resources and gain opportunities in global markets. Understanding the experiences of both developed and emerging economies shows that IFDI and OFDI development and patterns are not only related to the comparative advantages of home countries but are also affected by government influences and policies (Dunning et al., 2001; Dunning and Lundan, 2008). In emerging economies, institutions significantly affect FDI motivation and are an additional factor affecting MNEs' international investment (Buckley, 2010; Luo and Tung, 2007). According to Narula and Ubeda (2001), the attraction of IFDI and the generation of OFDI in emerging economies is because of government policies that enhance location advantages in the home country, which in turn enables the establishment of ownership advantages of domestic firms.

Brewer (1993) reports the effect of home and host country government policies on market imperfections and FDI and finds that these policies significantly affect FDI inflow and outflow. Boddewyn and Brewer (1994) indicate that MNEs respond to governments and institutions in two ways, influencing their motive for internationalisation. Firstly, MNEs internationalise when the motivation for OFDI at the firm and government are similar. In this case, firms are satisfied with the incentives offered by the government. Buckley et al. (2010) say this is synonymous with Chinese SOEs. Given that the Chinese government is a major stakeholder, the government's motives to pursue international investment opportunities in China are aligned with those of the SOE. Chinese SOEs benefit from this immensely and have direct access to government incentives when seeking to pursue international investment. Secondly, foreign investment is pursued as a strategy to escape the home country's institutional and market limitations (Boddewyn and Brewer, 1994). Again, this occurs mainly because there is a difference in the firm's motivation and institutional environment. In emerging markets, the institutional environment is plagued by adverse factors such as ineffective property rights, inadequate laws and judicial regulation, an ineffective bureaucratic climate and impracticalities by the government (Buitrago et al., 2020). These inadequacies affect the availability and quality of factor inputs or deter ownership advantages that serve the sector and the firm (Luo et al., 2010). Internationalisation is a reaction to escape these limitations.

3.3 Hypothesis Development

Given the lack of literature on explaining the determinants of OFDI/IFDI per se, I will use the existing literature on IFDI and OFDI to guide the hypotheses and model development. Having reviewed the empirical and theoretical literature on the determinants of FDI, a number of candidates appear as drivers of IFDI and OFDI. The variables and the number of variables I choose are based on three main criteria: (i) Model parsimony - so that the model is not impacted by noise from a large number of variables, and the model is useful for developing policy recommendations. (ii) Variables that seem to be commonly predicted by theories and employed in empirical studies. (iii) Availability of data. Based on these criteria, the variables that are selected for the hypotheses development and model building are (i) market size, (ii) Capital formation, (iii) technological capability, (iv) trade openness (import, exports), (v) real exchange rate and (vi) labour productivity. In what follows, I will use the literature to discuss the impact of each of these factors in relation to FDI in more detail and use the discussions to develop my hypotheses.

3.3.1 Market Size

Neuhaus (2006) and Pegkas (2015) have evinced that economic growth is an incentive for IFDI. Foreign investors seek out host countries with a growing economy because of the likelihood that a progressing economy and large market will enable cost-efficiency and economies of scale and scope (Blongien et al., 2007; Agosin and Machado, 2007). Buckley et al. (2007) explain that although FDI location depends on past or recent profitability and earnings, FDI motive also relies on the expected and future profitability of investment in the host country. The prospects for market growth need to be favourable to ensure long-term commitment by the foreign MNE. Zhang (2001) states that a higher economic growth rate leads to a higher level of aggregate demand, leading to increased profitable opportunities, thus increasing the incentive to pursue foreign investment in that host economy. A higher economic growth rate signals the size of the potential market size of the host economy (Blogien et al., 2007).

Kumari and Sharama (2018) used annual data from 1991 to 2010 to study the macroeconomic determinants of IFDI inflows in the post-liberalisation period in India. Using GDP per capita as a proxy for market size, inward investment inflow as a proxy for FDI, and trade openness measured as exports plus imports over GDP, Kumari and Sharama (2018) adopt an OLS

estimation method and find that market size and infrastructure have a positive and statistically significant effect on IFDI in India. Alam and Shah (2013) studied the macroeconomic determinants of IFDI in 10 OECD member countries from 1985 to 2009 using panel data. They performed Granger causality, cointegration tests and a vector error correction method (VECM) estimation method. The variables used in their model are market size, exchange rate, average wage as labour cost, infrastructure quality and trade openness. GDP per capita is used as a measure of market size, while trade openness is proxied by exports plus imports over GDP. The results indicate that market size, labour cost, and infrastructure quality are significant determinants of IFDI. Bilgili et al. (2012) used a sample from 1988 to 2010 to study the determinants of IFDI in Turkey. Using explanatory variables, namely GDP growth, labour cost, export and import growth, and oil price growth, they adopt a Markov regime-switching model and find that GDP growth, export and import growth have a significant and positive impact on IFDI. Using a dataset from 1975 to 1999 of 29 African countries, Onyeiwu and Shrestha (2004) adopt fixed effects and random effects estimation methods and find that market size proxied by GDP per capita and trade openness are positive and significant in attracting IFDI.

Kakoti (2019) investigates factors that affect OFDI in China. The study uses data from 1980 to 2016 and adopts augmented Dickey-Fuller (ADF), Phillips Perron (PP) unit root tests and an autoregressive distributive lag (ARDL) model. The study examines the effect of IFDI, GDP growth, real effective exchange rate and real interest rate on OFDI and finds that all the variables have a positive and statistically significant influence on India's OFDI. Saad et al. (2014) adopt a time series estimation method to test the effect of home country marker economic determinants of OFDI in Malaysia. The study uses GDP per capita as a measure of market size, IFDI, cost of skilled labour as a measure of labour productivity and total exports as a measure of international competitiveness. The study finds that labour productivity, market size and global competitiveness are positive and statistically significant to OFDI.

Couglin and Segev (2002) investigated FDI in China using provincial data on FDI inflows from 1990 to 1997 and found that GDP, wages, and labour productivity are significant determinants of IFDI. Hadi et al. (2018) used sector-level data (extractive, manufacturing, infrastructure, and service) to explore the economic determinants of IFDI in six ASEAN countries: Malaysia, Indonesia, Singapore, Thailand, Vietnam, and the Philippines. The study adopts an OLS and fixed effects estimation method to examine the effect of GDP growth rate, trade openness, exchange rate, and electricity consumption of IFDI. The result finds that market size, electricity consumption, and trade openness are positive and statistically significant to IFDI.

Several other empirical studies report the negative effect of economic growth on FDI inflow. Buchanan et al. (2012), Jensen (2003) and Tsai (1994) report a significant negative effect of economic growth in attracting FDI. Buchanan et al. (2012) adopted an OLS, fixed effects, and random effects model on 164 countries from 1998 to 2016 to examine the effect of governance, GDP per capita, and trade openness on IFDI. The results show that GDP per capita is negative and statistically significant in relation to IFDI. According to Buchanan et al. (2012), a higher GDP per capita deters FDI because the cost of business activities, such as labour and capital costs, increases as the standard of living rises. Tsai (1994) argues that the negative association results from a scaling effect; countries that grow faster than the growth in FDI will experience a decrease in FDI as a percentage of GDP. Jensen (2003) explains this negative association by indicating that a recession in the recipient country could attract various types of FDI, especially M&As, which can increase during a recession. This can drive labour and capital cost downwards, thereby improving the firm's cost structure. Akinlo (2004) suggests that FDI inflow is predominantly driven by natural resource exploration instead of economic growth and market size for mineral-rich countries.

Economic models such as the endogenous growth model (Romer, 1986) see IFDI as a catalyst for economic growth. DeMello (1997) maintain that FDI contributes to enhancing the stock of knowledge of the home and recipient countries and a consequent increase in total factor productivity through the transfer and dissemination of knowledge. Romer (1990) argues that it is the knowledge and technological spillover from research activities by MNE that leads to the creation of new knowledge in domestic firms. Through the enhanced capacity of domestic firms and the degree of economic development, the ability of OFDI by domestic firms in host countries is encouraged. This aligns with the IDP theory that the economic growth of a country is a significant determinant of OFDI (Dunning and Narula, 1996). Dunning and Udeba (2005)[9] adopted a dynamic panel analysis of Italy, Korea, Portugal, and Spain to investigate these countries' investment development paths using net ODFI, which is the difference between OFDI and IFDI (Dunning and Narula, 1996).

Utilising Net OFDI, Das (2013) studies various home country determinants of OFDI from developing countries from 1996 to 2010. Using a panel data econometric model, the study shows that the source country's level of economic development, political risk and technology investment

[9] Dunning and Udeba (2005) utlise Net OFDI (NOI) similary adopted in the Dunning and Narula's (1996) IDP theory. In their study NOI is defined as the difference between the outward foreign investment – inward foreign investment.

are significant OFDI factors. Bhasin and Jain (2013) model the role of the home country 'push factor' in encouraging OFDI. The study uses a fixed effect (least squared dummy variable) model on panel data from select Asian economies from 1991 – 2010 and finds that high GDP per capita and a high degree of trade openness are important home-country determinants of OFDI. Bhasin and Jain (2013) indicate that countries with liberal trade policies are favourable to OFDI activities. Liu et al. (2005) adopt the investment development path hypothesis to study China's OFDI in relation to its economic development. The study uses a GMM mode of estimation on time series data and finds that the level of economic development, proxied by GDP per capita, is a primary factor explaining China's rate of OFDI. Although the literature shows a positive relationship between OFDI and economic growth, Porter (1990) puts forward an industrial organisation theory which argues that a firm's motive to pursue OFDI is the constraints and limitations in its home country's industry or market. In line with this, Yang and Li (2009) find that firms may pursue international expansion to find profitable opportunities when facing high competition in an industry or market.

GDP per capita has served as a proxy for economic growth and market size in most empirical studies on inward and outward FDI determinants. Although some studies present a negative relationship between market size and IFDI, the bulk of studies show the existence of a positive relationship between IFDI and OFDI; therefore, in terms of the relationship between market size and OFDI/IFDI, the following hypothesis is proposed:

Hypothesis 1 – Market Size has a positive effect on the share of OFDI relative to IFDI.

3.3.2 Capital Formation

According to Abramowitz (1955), capital formation has a positive relationship with the economic growth of a country. He argues that the process of capital formation involves three interdependent elements – savings, finance, and investment – and growth in these factors constitutes a proportionate growth in economic development. Sani and Singhania (2017) investigated the macroeconomic determinants of IFDI in 11 developed and nine developing countries from 2004 to 2013. Adopting a GMM model, the study examines the effect of gross capital formation, growth rate, and trade openness on IFDI and finds that the variables have a positive and statistically significant effect on IFDI. Using provincial data on China from 1995 to 2010, Chan et al. (2014) studied the effect of GDP, capital, infrastructure, and wages on IFDI. Adopting a Granger causality estimation method, the analysis finds that capital formation, GDP, domestic investment, and infrastructure stimulate IFDI. Finally, Kok and Acikgoz (2009) adopt

an FMOLS and cross-section SUR estimation method in 24 developing countries and find that macroeconomic factors such as gross fixed capital formation and GDP have a positive and significant relationship to IFDI.

The neo-classical school (Fisher, 1998; Rogoff, 1999) argues that international capital compensates for scarce capital and domestic investment and growth in developing countries as a remedy for capital-scarce countries. Krkoska (2001) suggests that IFDI is an essential form of financing capital in developing countries relative to other enterprise financings such as foreign credit. Capital inflow through FDI contributes to the fiscal financing deficit in countries where infrastructure and government welfare expenditure exceed government revenue. In line with this, Lipsey (2001) argues that foreign capital inflows are essential in bridging the savings gap and are preferable to short-term flows or debt financing. Gunby et al. (2016) argue that after the reforms, China's economic development can be attributed to the inflow of foreign capital. China has accumulated substantial capital through IFDI and effectively channelled it to enhance its domestic economy (Wei et al., 2010). Aivazian et al. (2005) refer that China is a capital-abundant economy with a high savings rate and possesses excess capital relative to investment opportunities. Huang and Wang (2015) employed a panel unit root test, panel cointegration analysis and GMM estimation on data on Chinese provinces from 1998 to 2009 to investigate the impact of capital abundance on OFDI outflows. The study finds that capital abundance is positive and statistically significant.

The increase in IFDI is one of the significant drivers of economic growth in China (Das and Banik, 2015). China's FDI receipts, mainly in the industrial sector, contributed to export and capital formation (current account formation and foreign exchange reserve) (Sun, 2012; Wu et al.,201). This enabled China to navigate its transition to OFDI. Using annual Chinese data from 1987 to 2009 to explore the home country determinant of OFDI, Wei et al. (2010) perform a multiple linear regression and report that foreign exchange reserve has a positive and significant effect on OFDI. This capital inflow contributes to the foreign exchange reserve and enhances economic development (Baharumshah and Thanoon, 2006). Wei et al. (2014) indicate that China's access to capital, its ample foreign exchange reserves, and favourable funding of OFDI projects by the Chinese government encourage Chinese MNEs to internationalise. Promoting capital is one factor contributing to the build-up of industrial capacity in the Chinese economy, thus enabling the ownership advantage of domestic companies and facilitating OFDI (Dunning and Narula, 1996). In light of the discussions here, the following hypothesis is proposed:

Hypothesis 2 – Capital Formation has a positive effect on the share of OFDI relative to inward.

3.3.3 Technological Capability

FDI is a significant conduit of technological diffusion across borders since both inflow and outflow of FDI enable the transfer of new technologies, production methods, and organisational management capabilities (Bodmand and Le, 2013). Developing countries suffer from idea and technology gaps due to the absence of essential knowledge for value creation. Findlay (1978) argues that FDI is a way to advance economic performance in developing countries that suffer from a technological gap by transmitting more advanced technologies introduced by multinational firms from advanced economies. According to Borensztein et al. (1998), the growth rate of an economy can be determined by the technology it embodies, and the economic growth of developing countries depends on their ability to assimilate and implement advanced technologies technology transferred by foreign MNEs.

Driffield and Taylor (2000) point out that IFDI focused on research and development produces higher added value and enhances economic performance. The UNCTAD (2012) and Arkolakis et al. (2008) indicate that technology and knowledge transfers in the form of training and technical assistance are made voluntarily to their domestic supplier in the host country by foreign MNE to ensure efficiency in their production process. The transfer of new technologies by foreign MNEs enables the reduction of research and development (R&D) costs of domestic firms in recipient countries that receive these technologies, thus enabling their ownership and competitive advantage (Berthelemy and Demurger, 2000). The increase in the ownership advantage in the technology of the domestic firms will enable them to compete with international companies and seek OFDI opportunities (Desai et al., 2005).

The pursuit of economic development encouraged the Chinese government to implement FDI liberalisation policies to attract IFDI. Motivated by China's market size and demand, low labour cost, innovative capacity, and tax incentives, MNEs increasingly sought out investment opportunities in China. China's use of its location advantages to attract FDI was based on strategic goals set by the Chinese government. Qu and Green (1997) believe these gaols included capturing technology, management know-how, and equipment to enhance existing structures and improve economic efficiency. It also released foreign capital to promote economic development, gain access to foreign markets and boost exports to increase foreign exchange earnings. These strategic goals increased Chinese firms' industrial capacity and productivity as

technology and managerial know-how were transferred from foreign MNEs in China to domestic firms. Thus, the ownership advantage of firms in China's industries rose.

Veron's (1966) product life cycle model is the theoretical foundation for the notion that the ability of countries to engage in international trade and production depends on their technological capability, ownership, and competitive advantage. The role of technological capability in explaining OFDI from a developing country has been found to include not just the product life cycle theory (Wells, 2009) but the notion of localised technological change (Lall et al., 1983) and technological accumulation (Tolentino, 2008). Using R&D expenditure as a proxy for technology, several studies have found that it has a statistically significant positive effect in explaining US OFDI (Lall et al., 1983). Cantewell and Bellak (2001) report a statistically significant positive relationship between the patenting advantages of 15 Japanese manufacturing firms and FDI. Using firm-level data, Pradhan (2004) analyses the determinant of the overseas direct investment activity of Indian manufacturing enterprises. The study examines the effect of firm-specific factors such as age, size, technology capability, and export orientation. Adopting a Tobit model and R&D expenditure as a proxy for technology, the study finds that technology is positive and statistically significant to the internationalisation of Indian manufacturing firms. Wei et al.'s (2010) study of the home country determinant of OFDI states that the increased technological capability of domestic Chinese is translated into an upgraded ownership advantage, which encourages OFDI. In line with this, Dunning and Narula (1996) reiterate that the technological transfer from earlier IFDI activities in China by foreign MNE engendered the country's technological capability, particularly in the secondary and tertiary sectors.

Through outward investment, technological know-how can also be transferred from the host country back to the home country. Wei et al. (2010) indicate that many Chinese companies use M&As to access high-tech markets for internal technology upgrading. The Lenovo-IBM and TCL-Thompson deals are examples. Bhaumik et al. (2016) conclude that strategic asset-seeking FDI significantly drives MNEs. Developing countries such as China pursue knowledge and technological acquisition in technologically advanced markets, and the MNE transfers the know-how back to the home country, thus further upgrading its technological capacity. However, for this knowledge to result in productivity and economic growth, the home country's technological capability must be adequate to enable economic productivity. Based on these discussions, the following hypothesis is proposed:

Hypothesis 3 – Technological Capability has a positive effect on the share of OFDI relative to IFDI.

3.3.4 Trade and Trade Openness

To distinguish between various forms of trade in the modelling section, trade in this chapter is defined as imports and/or exports; trade openness is defined as imports plus exports over GDP. Numerous international business and economic development literature studies accentuate the significance of trade openness to trade and foreign direct investment. Asiedu (2002), Kyrkillis and Pantelidis (2003), Buckley et al. (2007), and Wei et al. (2010) evince the significant and positive relationship trade openness has on foreign direct investment. By implementing trade liberalisation policies, developing countries, such as China, have become more open, thus enabling foreign investors to export and gain access to the large Chinese market, which is a significant market potential for their products (Aw and Tang, 2009). Kyrkillis and Pantelidis (2003) also clarify that liberalising a country's international trade is expected to positively impact outward foreign direct investment since the more an economy is open to foreign transactions the easier it is for domestic firms to invest abroad. In line with this, Wei et al. (2010) indicate that imports and exports are primarily connected with the government's implementation of trade liberalisation policies.

Before adopting the 1978s trade reform policy, China adopted the import substitution development strategy, which effectively applied various economic resources to encourage the pursuit of industrialisation through a centrally controlled economic system (Shafaeddin and Pizarro, 2007). Although China had built a relatively functional industrial system, its competitiveness lagged behind other countries (Jayanthakumaran and Lee, 2007). The reforms led to an increase in imports and exports, promoting FDI. Chuang (1998) argues that trade-induced learning is an instrument of rapid economic growth. The increased import of inputs and intermediate goods facilitated learning by trade in China's industries. The study also finds that imports and exports are essential sources of learning in domestic sectors in Asian economies. The trade effect highlights the technology and knowledge diffusion fostered by importing technically sophisticated goods from advanced countries (Chaung, 1998). Teece et al. (1997) believe that through mechanisms such as reverse engineering, domestic industries can learn through the importation of goods. Chaung (1998) argues that Asian countries have been classified as reverse engineers because they import new goods, have them copied by domestic

firms, and then export them. Hobday (1994) studied Singapore's electronics industry and found that technology was accumulated through gradual learning.

UNCTAD (2019) shows that a country's integration into the global trading system improves the supply of and increases the demand for new technology. The progression of open trade, particularly trade with more advanced economies, accelerates the learning process for developing countries through technology diffusion and improves productivity. Kasahara and Rodrigue (2008) conclude that becoming an importer of foreign intermediates improves productivity using plant-level Chilean manufacturing panel data. Halpern et al. (2015) find that importing foreign varieties would increase firm productivity by 12% and that from 1993 to 2002, productivity growth in Hungary was due to imported inputs. Using Indonesian manufacturing census data from 1991 to 2001, Amiti and Koning (2007) find that a 10% fall in input tariffs leads to a productivity gain of 12% for firms that import their inputs. Goldberg et al. (2010), using trade and firm-level data from India, find that lower input tariffs explain the average 31% of new products introduced by domestic firms.

According to Dunning's IDP theory, this rise in imports is evident during the initial stages of the investment development path as foreign firms will prefer to export to and import from the domestic economy or participate in corporative non-equity arrangements with the indigenous firms. This is because the ownership advantages of the firms in the host country are limited and lagging in comparison to the foreign multinational firms as there is little or no indigenous technology accumulation and hence few created assets. However, as the host country imports, domestic industries begin to attain ownership advantages through learning, technological, and knowledge spillover. The increase in productivity of these industries gives location advantages, thus enabling the host economy to be a viable target for FDI. Using exports as a first means for penetrating a market, foreign companies gain further knowledge about that market. They can consider pursuing equity investment as the host country progresses through the investment development path. The inflow of FDI promotes these exports by (1) augmenting domestic capital for exports; (2) aiding the transfer of technology and new products for export; (3) facilitating access to new and large foreign markets; and (4) providing training for the local workforce and upgrading technical and management skill (Zhang, 2001).

Wei et al. (2010) argue that export promotion is China's motive for enabling FDI. FDI provides China with competitive assets for export-oriented production in technology-intensive and dynamic products (Zhang and Song, 2001). The transfer of such assets by foreign affiliates or

non-equity partners in China through training, skills development, and knowledge diffusion opens up the prospects for further dissemination to other enterprises and the economy. Thus, more firms (including domestic enterprises) can develop their exports, and the factors underlying competitiveness get rooted in the Chinese economy. According to Jinjun (1995), export growth played a significant role in China's economic development. Through exports, it increased its foreign exchange reserve, domestic savings and accelerated capital formation. Grog and Strobl (2001) performed a meta-analysis on a sample of 68 country-specific focusing on the link between export and economic growth. The two studies reveal a positive relationship between the two. Klein et al. (1998) argue that exports significantly contribute to the changes in the structure of an economy from a primary to a manufacturing economy. Zhang (2002) argues that China's transformation of its economic system satisfies Klein's criterion. In 1982, China's agricultural sector was the predominant contributor to national income. This diminished in the 1990s, and 2000 as manufacturing, construction, and service increased significantly. By 2010, firms were innovating management and production methods with advanced foreign technology and new equipment. They had transformed their primary manufacturing to high technology, high quality, and high value-added manufacturing in the export sectors.

This increase in ownership advantages and macroeconomic conditions through exports further encourages domestic firms to seek OFDI opportunities. Following the IDP, developing countries first import and attract FDI. As productivity improves and the economy grows, the host country begins to export and eventually pursues OFDI. Lui et al. (2001) examine the causal relationship between FDI and trade in China and find a virtuous pattern of development: the growth of imports causes the increase in IFDI, which leads to the growth of exports and eventually leads to OFDI. Thomas and Narayanan (2017) estimate a dynamic tobit model from 1998 to 2009 on data from Indian manufacturing firms. The study investigates the impact of firm-level total factor productivity, import, and export intensity, firm size, firm age, ownership and R&D intensity on the share of OFDI. The study finds import and export intensity has a positive and statistically significant impact on the share of OFDI. Duran and Ubeda (2010) argue that an economy's outward direct investment and export activity are separate entities and consider exports a precursor to OFDI.

Numerous studies have focused on the relationship between exports and OFDI and found that exports and OFDI have a substitute or complementary relationship. Helpman et al. (2004) argue that whether the relationship is complementary or substitute depends on the type of FDI. Horizontal FDI denotes the predominant negative effect on exports, thus, establishing a

substitution relationship. Markusen and Venables (1998) develop a model considering countries with different factor endowments and technologies. The study finds that trade and FDI have a reverse substitute relationship as they become similar considering relative factor endowments and technologies. Markusen (1984) predicts a substitution relationship between horizontal FDI and exports. Horizontal FDI arises from the interaction of plant-level and firm-specific activities such as R&D, marketing or managerial services. Therefore, whether an MNE establishes an affiliate or tends to export depends on the trade costs (tariffs) and the costs of establishing a new firm near the customers. As horizontal FDI tends to take place between countries that are similar in terms of factor endowment, income and technologies, the model predicts a negative link between skill differences and horizontal FDI.

Helpman (1984) argues that, with vertical FDI, there are complementarities between the trade flows of final goods from foreign affiliates to parent firms and intra-firm transfers of intermediate goods from parent firms to foreign affiliates. The model generally suggests that vertical FDI will likely occur between developed and developing countries. A firm's presence in a foreign market with one product may increase the demand for the entire line of products (Lipsey and Weiss, 1984). Another reason for complementarity could be that an investment by a manufacturer may increase the exports of inputs from the home market to the host market (Braunerhjelm and Svensson, 1996). Bhasin and Paul (2016) argue that OFDI is undertaken abroad as a substitute for exports and has two effects on the economy. First, it diverts domestic investment to channels other than the home country and causes a negative balance of payments through reduced foreign exchange earnings. Secondly, if it leads to an additional increase in exports through forward and backward links, the relationship will boost domestic investment and contribute to the economy's growth. Pfaffermayar (1994) employs the Granger causality procedure on Austrian FDI and exports and finds significant positive causation in both directions. While examining the relationship, Eaton and Tamura (1994) control for macroeconomic determinants such as income per capita, human capital and population. They find a significant complementary relationship. In contrast, Anderson and Hainaut (1998) find a complementary relationship for the US, Japan and Germany but not for the UK.

Focusing on the relationship between exports and FDI, Lipsey and Weiss (1981) find a positive relationship between US exports and FDI for 40 economies in 1970. Blongien and Slaughter (2001) find a substitution effect between the production of Japanese vehicle parts in the US and the Japanese export of automobile parts to the US. The relationship between the production of Japanese vehicles (final goods) in the US and Japanese exports of automobile parts is

complementary. Turkan (2006) identifies a highly significant complementary relationship between US trade and FDI stocks of intermediate goods exports and a slightly negative relationship between FDI and trade final goods. Turkan (2006) also find a strong complementary relationship between FDI and trade in final goods. These studies have identified the significant role of imports and exports in an economy's transition from a host economy that attracts IFDI to a generator of OFDI. Although the empirical literature remains mixed, this thesis chapter seeks to understand the relationship between China's investment and development journey. Therefore, based on the discussions above, the following hypothesises are proposed:

Hypothesis 4 – Import has a positive effect on the share of OFDI relative to IFDI

Hypothesis 5a – Export has a positive effect on the share of OFDI relative to IFDI

Hypothesis 5b - Export has a negative effect on the share of OFDI relative to IFDI

Hypothesis 5c – Trade openness has a positive effect on the share of OFDI relative to IFDI

3.3.5 Real Exchange Rate

Aliber (1970), Pantelidis and Kyrilis (2005), Wei et al. (2010), and Hung and Chen (2018) show the significance of exchange rate as a determinant of FDI. Aliber (1970) states that countries with strong currencies can borrow and invest at a lower cost than host countries with weaker currencies, thereby enabling them to pursue risky investment opportunities at less cost. Thus, countries with strong currencies have an advantage in investing abroad. Agarwal (1980) argues that in IFDI in the US, UK, Germany, France, and Canada, Aliber's (1970) assertion is applicable. Graham and Krugman (1995) show that increases in IFDI in the US coincide with the US dollar depreciation. Froot et al. (1992) developed a model that connects exchange rates, wealth positions, and FDI in the US. The study shows that a host country's currency depreciation increases IFDI. Klein and Rosengren (1994) examined the determinant of IFDI to the US from seven industrial countries from 1979 to 1991. The study finds strong evidence that the host country's exchange rate depreciation relative to the investing country leads to an increase in IFDI for the host economy. Using data from the US, Canada, the UK, and Japan, Campa and Goldberg (1999) examined the implications of exchange rates on sectorial investment. The study evinces that investment has a positive responsiveness when the exchange rate of the MNE exporting sector is more appreciated than that of the investment destination country. Chen et al. (2015) developed a game theoretical model to investigate heterogeneous firms' entry choices to host countries. The study finds that firms from countries with a more appreciated exchange rate

relative to their destination host economies pursue outward investment opportunities. Feng et al. (2022) adopted a linear probability model on Chinese enterprise-level data from 2001 to 2012 to investigate the effect of exchange rate on OFDI. The result of the study indicates that the appreciation of the Chinese RMB can promote OFDI, as it can lower the financial and capacity threshold for FDI.

Caves' (1989) research showed a significant negative correlation between the exchange rate and IFDI. Baek and Okawa (2001) found that the depreciation of Asian countries' currencies against the dollar significantly increases FDI in the export-oriented sectors, such as the chemical and electrical machinery sectors because their products become more competitive in International trade. Dees (1998) finds that the effect of the exchange rate is negative. The findings indicate that a devaluation in China's real exchange rate increased IFDI. Ali and Guo (2005) argue that the exchange rate was not the main factor for foreign MNEs' attraction to the Chinese economy. Lui (2010) found that the exchange rate depreciation had a positive effect on IFDI in China. Vijayakumar et al. (2010) find a negative relationship between IFDI and real exchange rates in BRIC countries using annual data from 1975 to 2007. Ang (2008) argues that a devaluation of a host country's currency increases IFDI, and a devalued currency would increase the wealth position of foreign investors, thus lowering the cost of capital. This allows them to make a significantly larger investment in host economies.

Aliber (1970) argues that MNE from home countries with strong currencies have more financial capacity than weaker ones. The appreciation of the home country's currency reduces the capital requirement for the MNE (Pantelidis and Kyrilis, 2005). The home country's exchange rate appreciation produces more profitable OFDI opportunities because assets become cheaper (Wei et al., 2013; Hung and Chen, 2018). Cushman (1985) examines the effect of exchange rate risk on FDI and finds that a devaluation of home currency encourages IFDI, while an appreciation leads to the reduced capital cost incurred in pursuing foreign investment opportunities. Buckley et al. (2007) indicate that the exchange rate appreciation from a low position may more than proportionally increase OFDI. However, in their investigation of home country determinants of OFDI in China, they find that the exchange rate is positive but statistically insignificant. Kogut and Chaung (1996) and Blongien (1997) conclude that the Japanese yen's appreciation fuels Japanese MNE entry to the US. Thomas and Grosse (2001) also indicate that firms from a country with a higher real exchange rate relative to Mexico increase the firm's likelihood of investing.

In contrast, various studies find a negative relationship between real effective exchange rates and OFDI. They conclude that a devaluation of the home economy's currency increases its ability to pursue international investment. Takagi and Shi (2011) explain that Japan's expectation of yen appreciation discouraged Japanese OFDI. Lui and Deseatnicov (2016) study the relationship between exchange rate and Chinese OFDI to 119 countries using data from 2003 – 2013 to account for China's 2005 floating exchange rate policy. The results show a negative relationship between OFDI and the exchange rate. Gorg and Wakelin (2002), and Campa (1993), found that the exchange rate has a negative influence on OFDI. One explanation advanced in the literature is that current appreciation increases the possibility of future depreciation, which may result in lower overseas returns. Therefore, OFDI may be adversely affected. However, Lui and Deseatnicov (2016) point out that these results are counterintuitive and contradictory to the literature. Based on the discussions above, the following hypothesis is established:

Hypothesis 6 – An appreciation of China's exchange rate has a positive effect on the share of OFDI relative to inward.

3.3.6 Labour Productivity

This section will discuss the impact of labour productivity on FDI. Some studies have also employed labour cost as a measure of labour skill and productivity. Therefore, the terms labour cost and labour productivity will be used interchangeably. After the 1970s trade liberalisation, IFDI in China was predominantly labour-intensive. In the years post the 1970s change, foreign MNEs were attracted to China because of its supply of low-skilled labour. Chen (1996) investigates the effect of host country market size, labour wages, transportation links and technology on IFDI in China. By adopting the average wage as a measure of labour cost, the study finds that it has a negative and significant effect on IFDI. The study argues that China's primary incentive for foreign MNEs was low production cost due to China's abundant, low-cost labour supply. Pantelidis and Paneta (2016) adopt an OLS estimation technique to investigate the effect of trade openness, exchange rate, market size and labour cost measured as an average wage on IFDI in Greece. The result shows that labour cost has a negative and statistically significant effect on IFDI. Cheng and Kwan (2000) employ regional data from 29 Chinese regions from 1985 to 1995 to study the effect of infrastructure, market accessibility, wage cost and tax rate on IFDI. By adopting a GMM estimation method, they find that wage cost has a negative and statistically significant effect on IFDI. Based on the OLI, labour cost, which

substantially impacts production cost, is the main factor that feeds into the MNE's decision to invest in a particular country. Mukherjee and Broll (2007) also found that firms often invest in countries with advantages in factor costs. Head and Mayer (2019) confirm that automobile manufacturers in major developed economies transfer large portions of assembly links to countries with labour costs to maximise profits. Duanmu (2014) studies the factors that impact the location choices of outward investment BRIC economies' MNES. The findings show that MNEs from these emerging economies follow the patterns of developed countries and locate their investment in countries with lower labour standards.

Following another line of literature, numerous studies have adopted labour cost as a measure of labour productivity or high-skilled labour (Lai and Sakar, 2021). With the inflow of FDI, technological and managerial skills are transferred from the foreign MNEs to the labour market. IFDI thus enables domestic workers' productivity and capability (UNCTAD, 2019). This is evident in China as the domestic sectors transition from more labour-intensive to capital-intensive processes. China's workforce transitioned from a predominantly low-skilled labour force focused on labour-intensive production to a high-skilled one, which enhanced the production of innovative capital-intensive goods and services (Donaubauer and Dreger, 2018). In time, China's labour market became highly productive, which was apparent because of its increased labour cost. It also became highly competitive. This increase in productivity resulted in the increased capacity of firms in China to compete with foreign MNEs and pursue international investment opportunities (Dunning and Narula, 1996). Lai and Sarkar (2021) use a dynamic panel estimation to investigate how skilled labour measured by average wage affects outward investment in Taiwan and China. They find that increased skilled labour and productivity are associated with increased labour costs. Additionally, the result shows that increased labour productivity positively influences outward investment. Based on the discussions above, the following hypothesis is proposed:

Hypothesis 7 – Labour productivity has a positive and statistically significant effect on the share of OFDI relative to inward.

3.4 Methodology, Data and Preliminary Investigation

This study examines some factors, guided by theory and empirical studies, that can potentially explain the evolution of OFDI as a share of IFDI in China using sectoral-level data. The IDP proposes the existence of a positive relationship between an economy's level of development and OFDI, as well as the IFDI it attracts (Dunning, 1981; 1993; Dunning and Narula, 1996). This

first study investigates the determinants of OFDI/IFDI using Chinese sectoral data; the findings will help gain further insights into the IDP theory, and in particular, the results will enable less developed and developing countries to devise policies that will enable them to reach a higher level of economic development through influencing IFDI and more importantly OFDI.

The empirical approach uses a panel data framework. Asiedu (2002), Buckley et al. (2007), Vijayakumar et al. (2010), and Jadhav (2012) used panel data analysis to capture the heterogeneous effect of a number of determinants on FDIs in countries, sectors and firms. This study uses panel data analysis to incorporate both cross-section and time-series dimensions. Baltagi (2008) states that panel data analysis is an effective method of analysing a panel dataset which consists of data for *n* entities observed at *T* periods. Such an approach is particularly convenient when *T* is small, which is the case in this study.

($XitYit$), i = 1…n and t = 1....T (3.1)

The linear panel data model is given by:

$Yit = \alpha + \beta Xit + \mu it$ (3.2)

In this study, n = 13 sectors, where each sector is observed over a T = 7-year period (2009 to 2015), forming a dataset of 91 observations, which demonstrates the properties of balanced panel data. Additionally, all the data used in the estimation are annual. Prior to conducting the estimation, I checked through the dataset for missing data and cleaned it by removing errors and outliers. Panel data is used in this chapter as well as the two other empirical chapters, for several reasons. Firstly, it enhances the statistical power of the model. Baltagi (2008) indicates that panel data allows researchers to use the same units repeatedly over time, which increases the number of observations and, thus, the statistical power of the analysis. This enabled the detection of smaller effects and relationship that was not observable when cross-sectional data was adopted. Additionally, a time series estimation could not be adopted because the period of the data, which is 7 years, cannot be estimated, as there are possibilities of biased and not statistically significant results. Based on the research question in this study and the lack of sector-level research on OFDI concerning China, we adopt a panel data estimation rather than a time series analysis.

Secondly, a panel data set was also adopted to control for unobserved heterogeneity. In line with this, Wooldridge (2012) indicates that the time-invariant variables specific to each unit are eliminated by controlling for individual or sector-specific effects. Thirdly, by adopting panel data,

we reduce measurement error by using the same measures over time. This ensures that any changes observed are due to actual changes rather than the difference in measurement methods.

In line with the above reasons, Gujarati and Porter (2009) and Hsiao (2000) summarise that panel data analysis increases reliability regardless of sample size and boosts the degree of freedom. In addition, it helps manage multicollinearity between the variables, minimises the effects of variable bias even with an unbalanced data set, and provides a more complex analysis than a stand-alone time series or cross-sectional data analysis. The two most commonly used methods are fixed effect and random effect. This study uses fixed effects estimation to allow for heterogeneity across the panel and to control for unobserved heterogeneity, such as industry-specific effects. The effects of six independent variables sectorial (market size, capital, technological capability, exports, imports, labour productivity) and real effective exchange rate on the dependent variable (share of OFDI relative to IFDI) in 13 of China's sectors investigated, and the research model is given by:

$$Log\ Share\ OFDI\ to\ IFDI = \beta_0 + \beta_1\ Log\ Capital_{it} + \beta_2 LogMarketSize_{it} + \beta_3 LogTechCap_{it} + \beta_4 LogExport_{it} + \beta_5 LogImport_{it} + \beta_6 LogREER_{it} + \beta_7 LogLabou\ Productivity_{it} + \alpha_{it} + \varepsilon_{it} + \mu_{it} \quad (3.3)$$

Where;

Dependent Variable

$Log\ Share\ OFDI\ to\ IFDI_{it} =$ OFDI relative to IFDI is proxied by the logarithm of OFDI flow over IFDI flow.

Details of the 13 sectors employed in this chapter and their corresponding industry classifications are provided in Table 3.1. The corresponding OFDI and IFDI data are graphically represented in Figures 3.1 to 3.14. With reference to the influence of OFDI within the context of the IDP theory, I seek to include data that capture the moment that OFDI supersedes IFDI. As discussed earlier using Figure 1.1, at the national level data, OFDI only exceeded IFDI temporarily in the year 2000, but at a sectoral level, OFDI supersedes IFDI and maintains that tendency in several sectors. In particular, this phenomenon can be observed for the following sectors: (i) agriculture, forestry and fishing (Figure 3.1), (ii) mining and quarry (Figure 3.2), (iii) electricity and water supply (Figure 3.4), (iv) construction (Figure 3.5), (v) wholesale and retail (Figure 3.6), (vi) transportation and storage (Figure 3.7), (vii) information and communication (Figure 3.9), (viii)

financial and insurance activities (Figure 3.10) and (ix) the education sector (Figure 3.12). Therefore, these provide me with a unique and never tested opportunity to examine the determinants of Chinese OFDI/IFDI from a sectoral perspective.

Table 3. 1 Sector Classification by Industry

Sector	**Industry**
Agriculture, forestry and fishing	Primary Industry
Mining and quarrying	Secondary Industry
Manufacturing	
Electricity and Water Supply	
Construction	
Transportation and storage	Tertiary Industry
Information and communication	
Wholesale and retail trade; repair of motor vehicles and motorcycles	
Accommodation and food service activities	
Financial and insurance activities	
Real estate activities	
Education	
Arts, entertainment and recreation	

Table 3.1 displays an overview of all 13 sectors of the dataset and their industry classifications. Source: Classification source from China Statistical Yearbook (2019)

Figure 3. 1 IFDI and OFDI Flows 2009 to 2015 – Agriculture, Forestry and Fishing Sector.

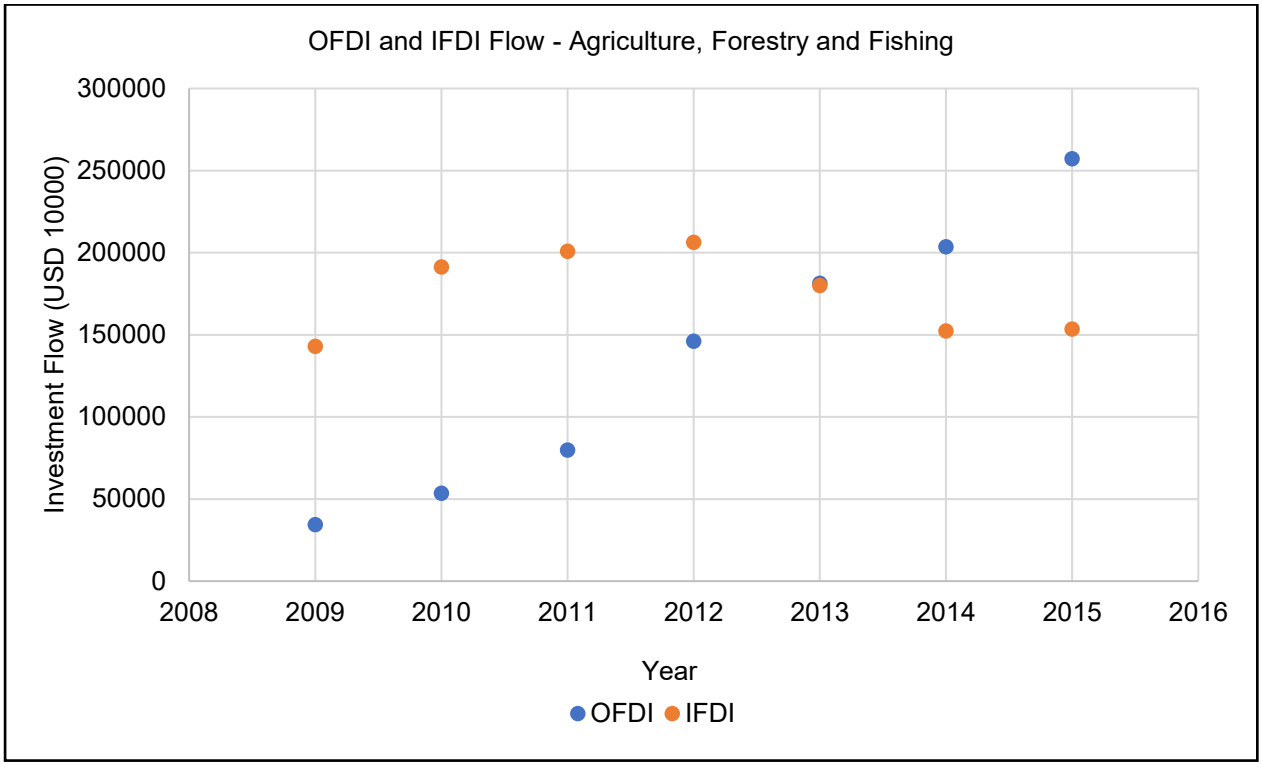


Figure 3.1 illustrates the OFDI and IFDI position of the agriculture, forestry, and fishing sector and shows that OFDI is increasing at a faster rate than IFDI. It shows OFDI passing IFDI in 2014.

Figure 3.2 shows that in the mining and quarry sector, OFDI significantly exceeds IFDI. Despite having considerable local mineral reserves (Wang et al., 2012), China has a shortage of some essential mineral resources. For example, its domestic supply of copper is less than 30% of the country's demand (Ming and Weiming, 2014), with the remainder imported from countries like Chile, Peru, Austria, and Mongolia (US Geographical Survey, 2019). China is also dependent on imported iron ore; in 2010, 60% of the iron ore used in China's steel production was imported (KPMG, 2011). In 2012, the Chinese government implemented the 12th Five-Year Plan to mitigate China's natural resource limitations, which stated that a priority would be to enhance China's overseas metal base and establish bilateral relationships for natural resource extraction with other countries (Bi and Bi, 2019).

Figure 3. 2 IFDI and OFDI Flows 2009 to 2015 – Mining.

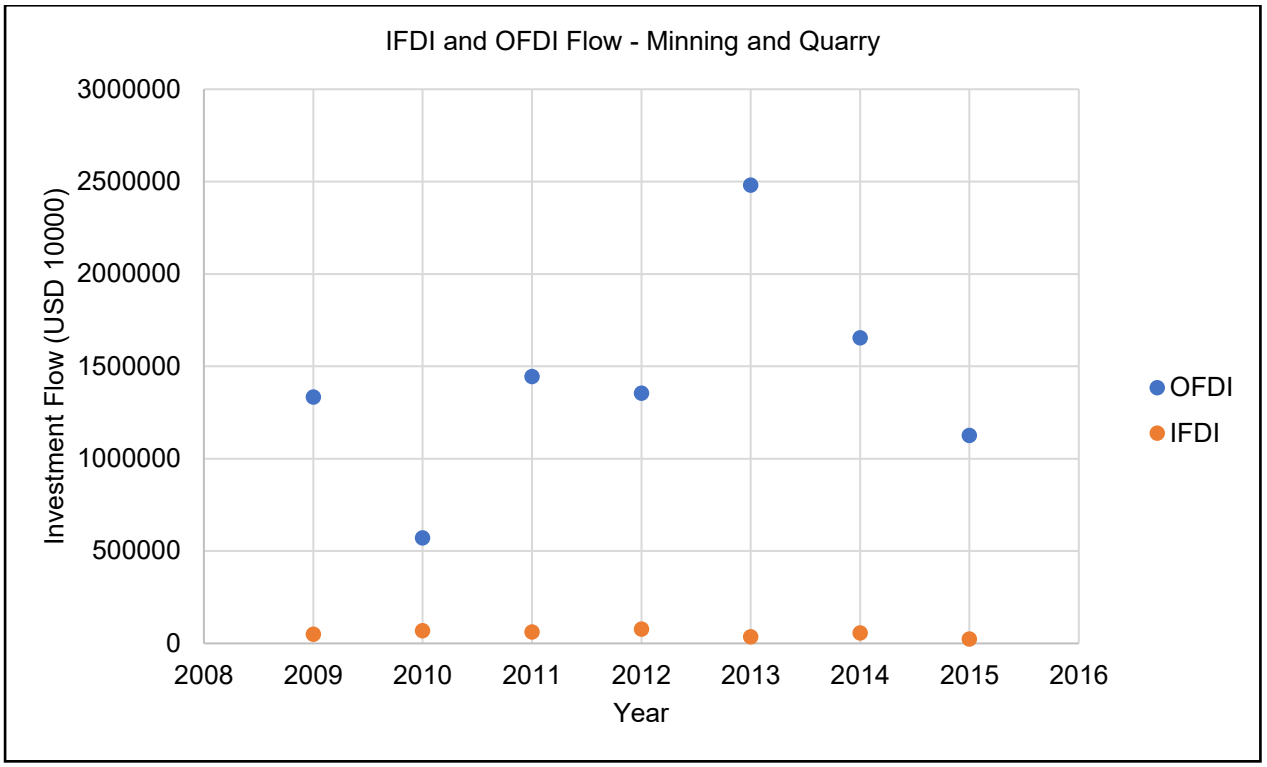


Figure 3. 3 IFDI and OFDI Flows 2009 to 2015 – Manufacturing

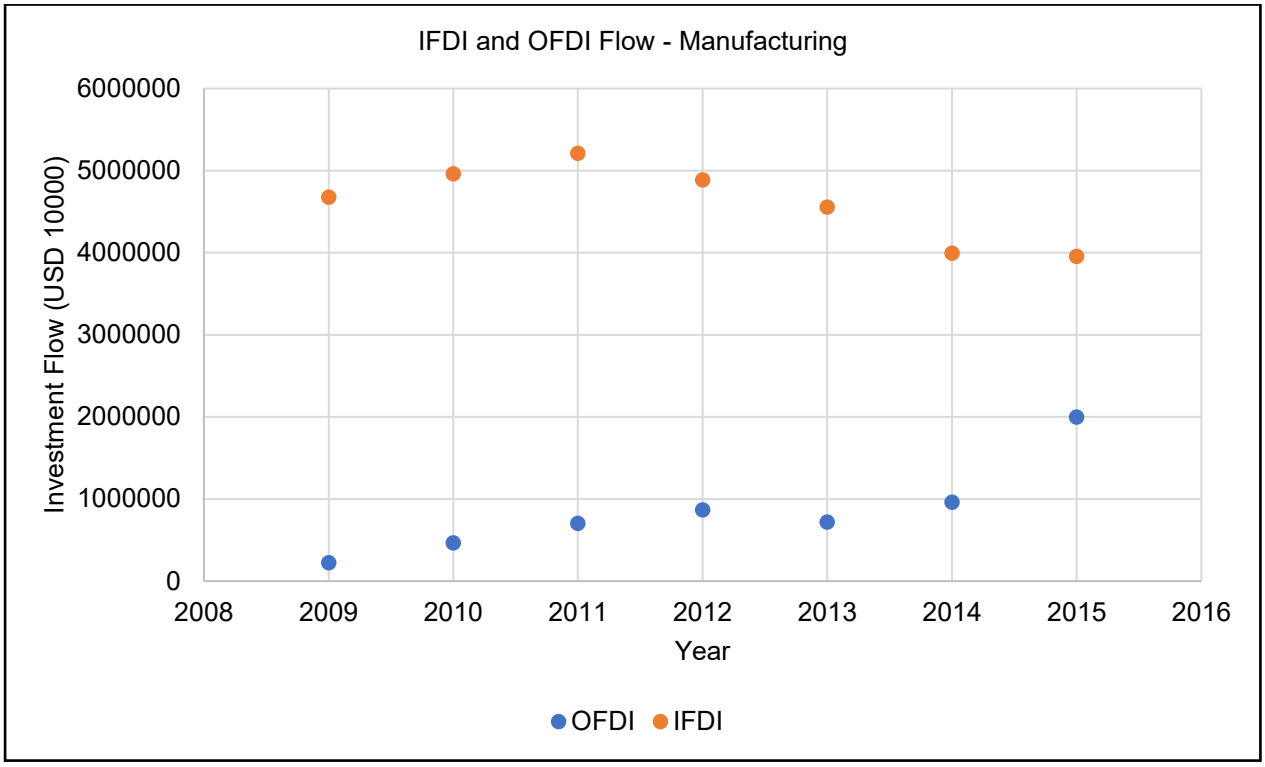


Figure 3.3 shows IFDI and OFDI for the manufacturing sector. IFDI flows are significantly higher than those of OFDI, but OFDI is growing faster than IFDI. Since implementing the open-door policy, the manufacturing sector has attracted a substantial amount of IFDI due to the cheap labour supply and relatively low cost of materials (Liu and Daly, 2011). Foreign investors tend to invest proportionately more in secondary sectors, mainly manufacturing, than in primary and tertiary industries (Ng and Tuan, 2006). In order to enable investments more investment in high-tech and more capital-intensive sectors, the Chinese government began encouraging foreign investors with advanced technologies and management skills. China transitioned from low- to high-tech manufacturing (Lui and Daly, 2011). As a result of the spillover, the capabilities of domestic firms in China were enhanced, and they began high-tech manufacturing and production (Lui and Daly, 2011). The improved capabilities of Chinese manufacturing firms have enabled them to pursue international investment. Calabrese et al. (2018) argue that OFDI in the manufacturing sector was facilitated by push factors, including China's upgrading of its manufacturing sector in the global value chain from low to high-technology manufacturing (Hou et al., 2017).

Figure 3. 4 IFDI and OFDI Flows 2009 to 2015 – Electricity and Water Supply.

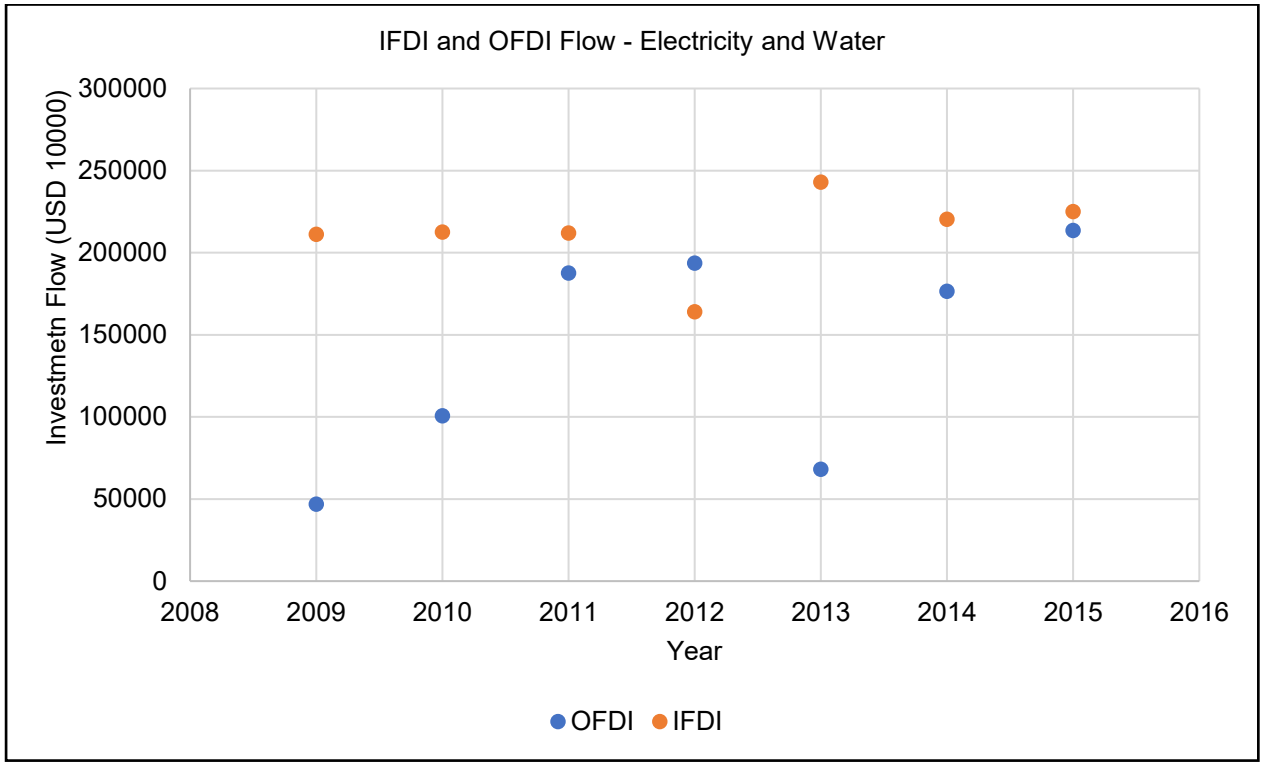


Figure 3.4 shows the FDI position of China's electricity and water supply sector. Although IFDI supersedes OFDI, the latter has grown more quickly and surpassed IFDI in 2012 before dropping rapidly in 2013. However, OFDI increased rapidly and reached the same level as IFDI in 2015. Since the establishment of the *Belt and Road* initiative in 2013, China's OFDI in the energy industry has increased rapidly, primarily because of international energy security concerns and domestic energy shortages (Tan et al., 2021). With the rapid growth of China's population and economic development, the gap between domestic production and consumption widens every year (Yuan et al., 2008).

According to Figure 3.5, IFDI was higher than OFDI in 2009 in the construction sector. However, the graph shows that from 2010, OFDI surpassed OFDI and grew at an increasing rate to become significantly higher than IFDI. Through the *Belt and Road* initiative, China sought to establish better relations with the global economy through trade, investment and infrastructure (Liu et al., 2020). It sought to provide over 100 countries with infrastructure such as roads, railways, airports and power plants. China is involved in infrastructure projects with 35 African countries (Chiyemura, 2021), and its construction sector facilitates these international construction projects (Liu et al., 2020).

Figure 3. 5 IFDI and OFDI Flows 2009 to 2015 – Construction.

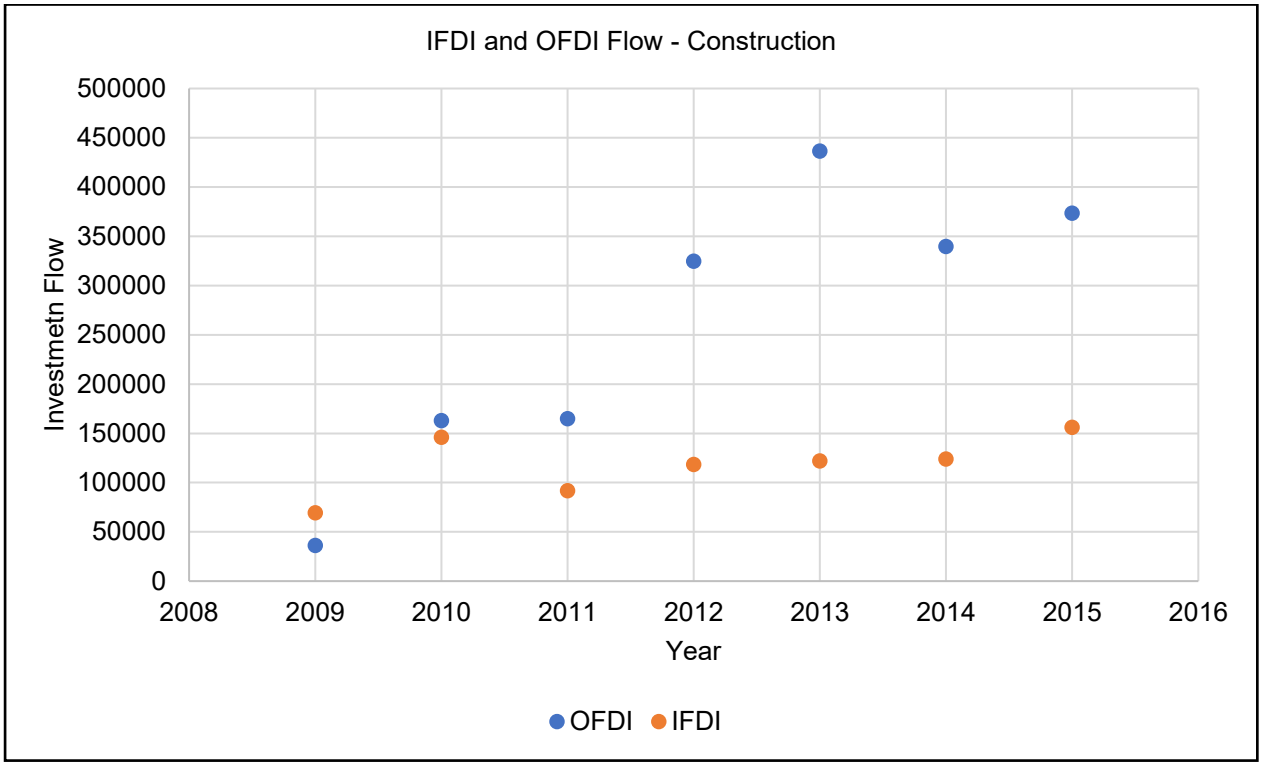


Figure 3.6 indicates that OFDI in the wholesale and retail sectors is far higher than IFDI. Since the late 1980s, China has implemented Joint venture investment policies to facilitate foreign investment into China's retail and wholesale sectors. In time, China's central government focused on developing domestic retail and whole chains to modernise China's retail sectors and respond to foreign competitors (Gu, 1998). As a result, China's retail and wholesale sector has competed globally with foreign retailers seeking Chinese products because of the low production and wholesale prices (Cai, 1997; Wang and Jones, 2001).

Figure 3. 6 IFDI and OFDI Flow 2009 to 2015 – Wholesale and Retail.

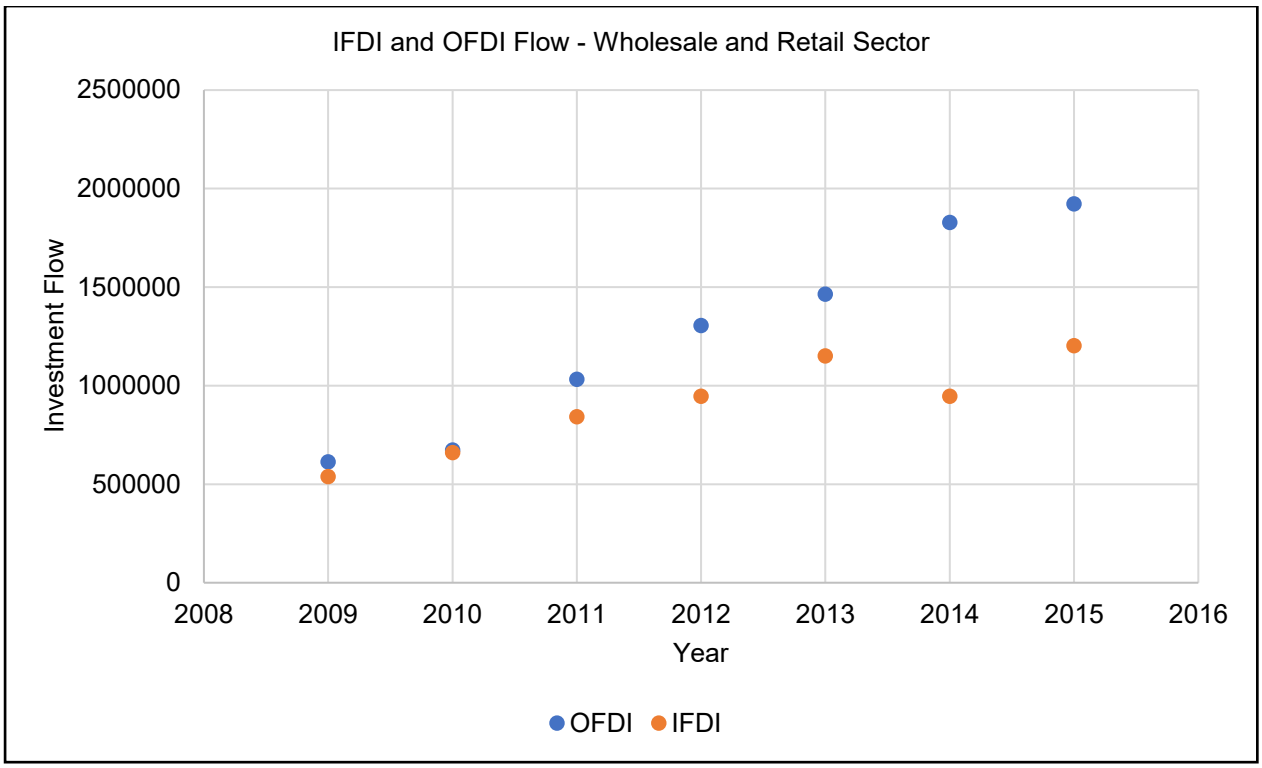
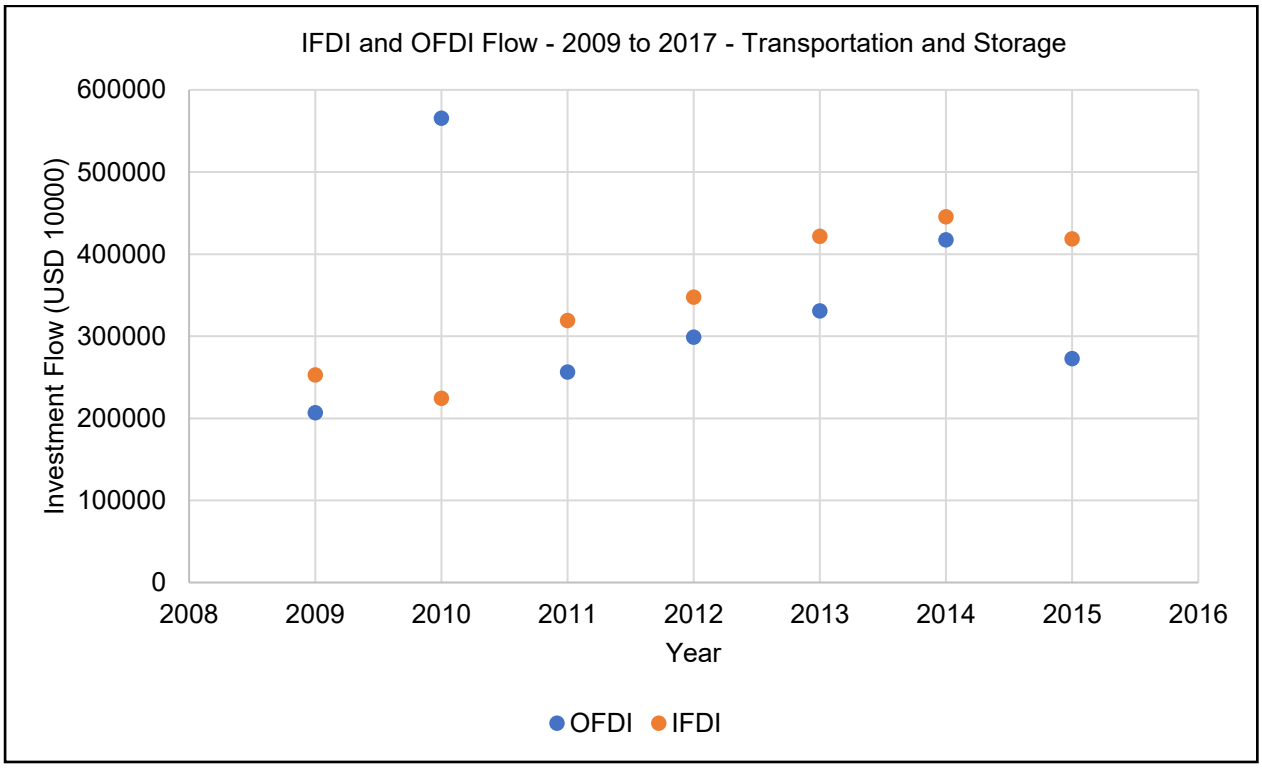


Figure 3. 7 IFDI and OFDI Flows 2009 to 2015 – Transportation and Storage

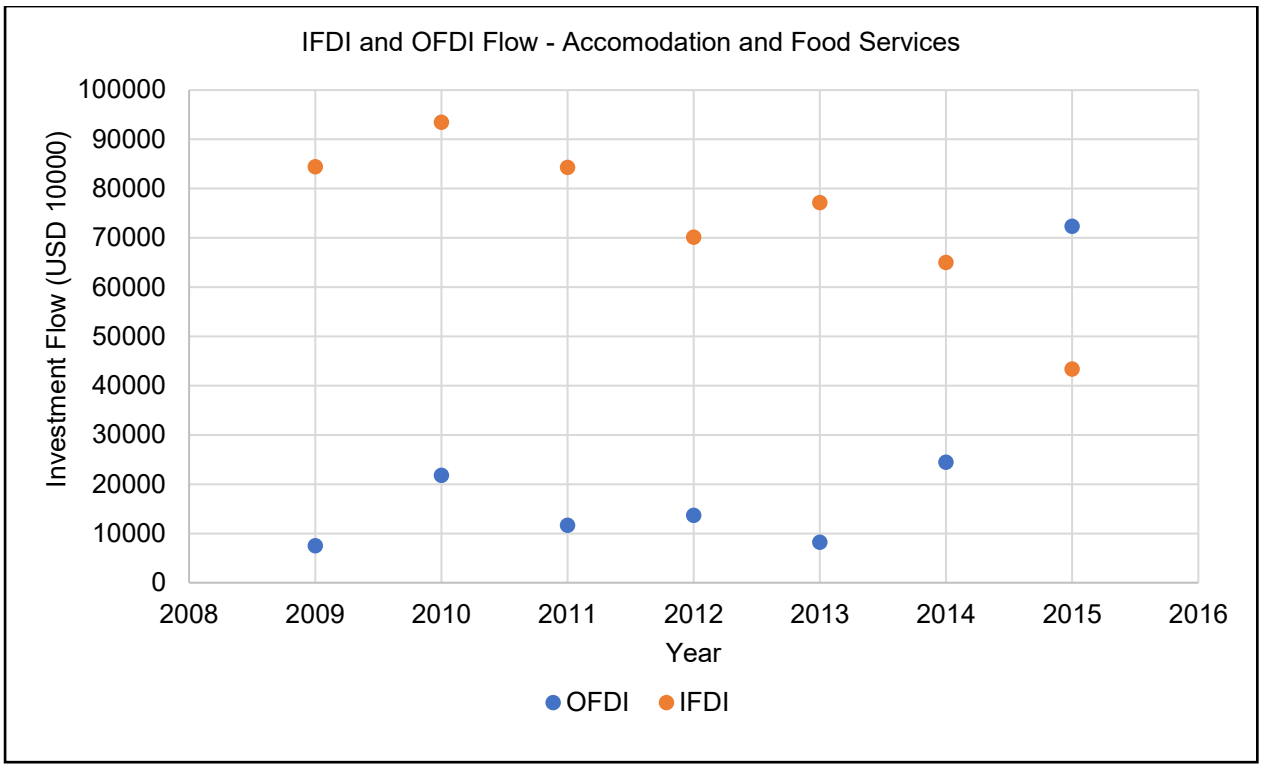


According to Figure 3.7, the IFDI in the transportation and storage sector, the foreign investment inflow is higher than OFDI. However, in 2010, the OFDI was significantly higher than IFDI. A similar story is displayed in the accommodation and food service sector. As portrayed in Figure 3.8, IFDI was greater than OFDI from 2009 to 2014. However, in 2015, overseas investment was significantly higher than foreign investment inflow to the sector.

Figure 3.9 displays the foreign direct investment position of the information and communication sector. According to the graph, from 2009 to 2013, IFDI was more prominent than OFDI. However, in 2014, OFDI became higher than IFDI and dramatically increased the following year. Prior to the 1990s, the technology, information, and communications sector was remarkably unreformed. However, by the 1990s, there was pressure on the Chinese government to improve access and quality, especially for the military (DeWoskin, 2001).

As a result, experimentation with new technologies commenced, and the door was opened to foreign technologies. In addition, China actively pursued ways to engage foreign capital to develop its technologies and networks aggressively. The government also actively encouraged foreign investment and technology transfer in the research, design, and manufacturing of telecommunication equipment (DeWoskin, 2001).

Figure 3. 8 IFDI and OFDI Flows 2009 to 2015 – Accommodation and Food Service Activities



This policy effectively reduced imports, transferred technology, and enhanced the domestic sector. In time, the establishment of telecommunication and high-tech innovation in Chinese firms increased (Loo, 2004). More importantly, these firms possessed the capability to compete with existing foreign firms in China and globally.

Figure 3.10 displays that in the financial and insurance sector, OFDI is relatively greater than IFDI. Additionally, this sector accounts for the largest outward foreign investment in the sample. In contrast, the real estate sector's foreign direct investment position portrayed in figure 3.11 shows that IFDI is significantly higher than OFDI. Also, China's real estate sector accounts for the highest foreign investment inflow after the manufacturing sector.

Figure 3. 9 IFDI and OFDI Flows 2009 to 2015 – Information and Communication.

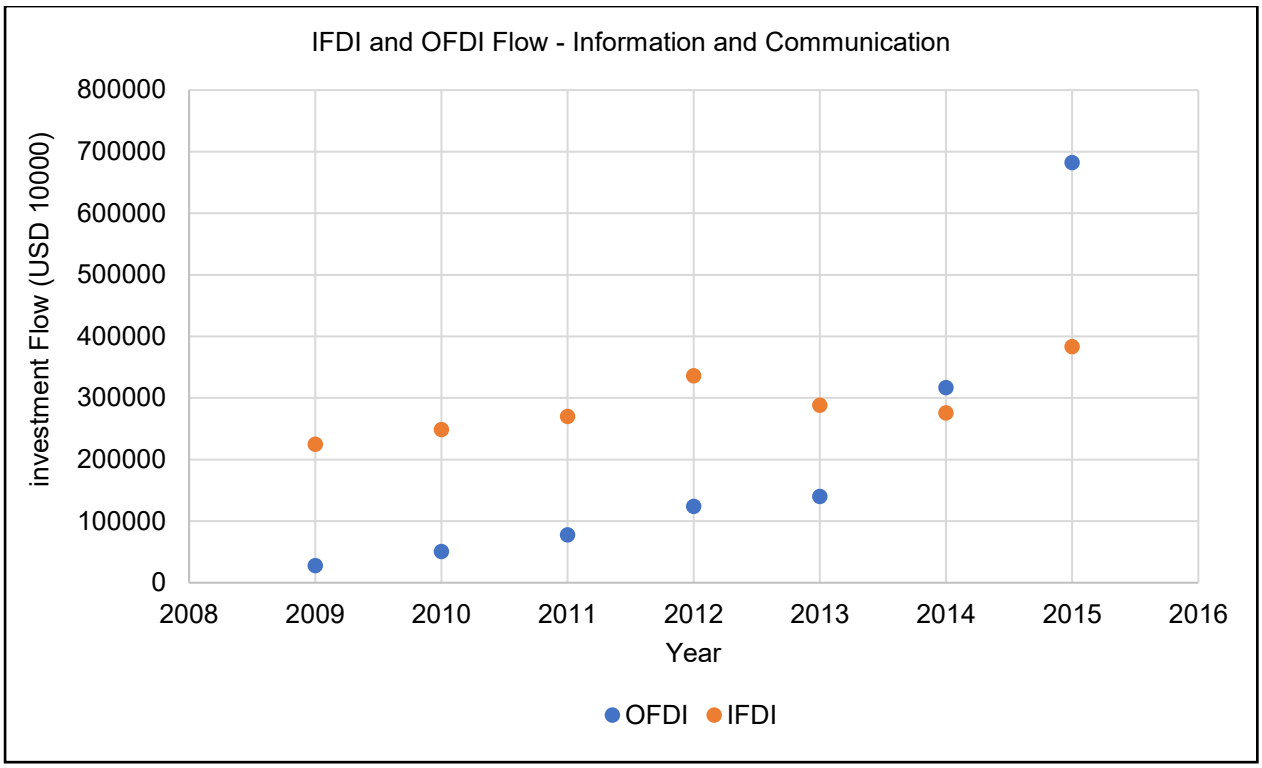


Figure 3. 10 IFDI and OFDI Flows 2009 to 2015 – Financial and Insurance.

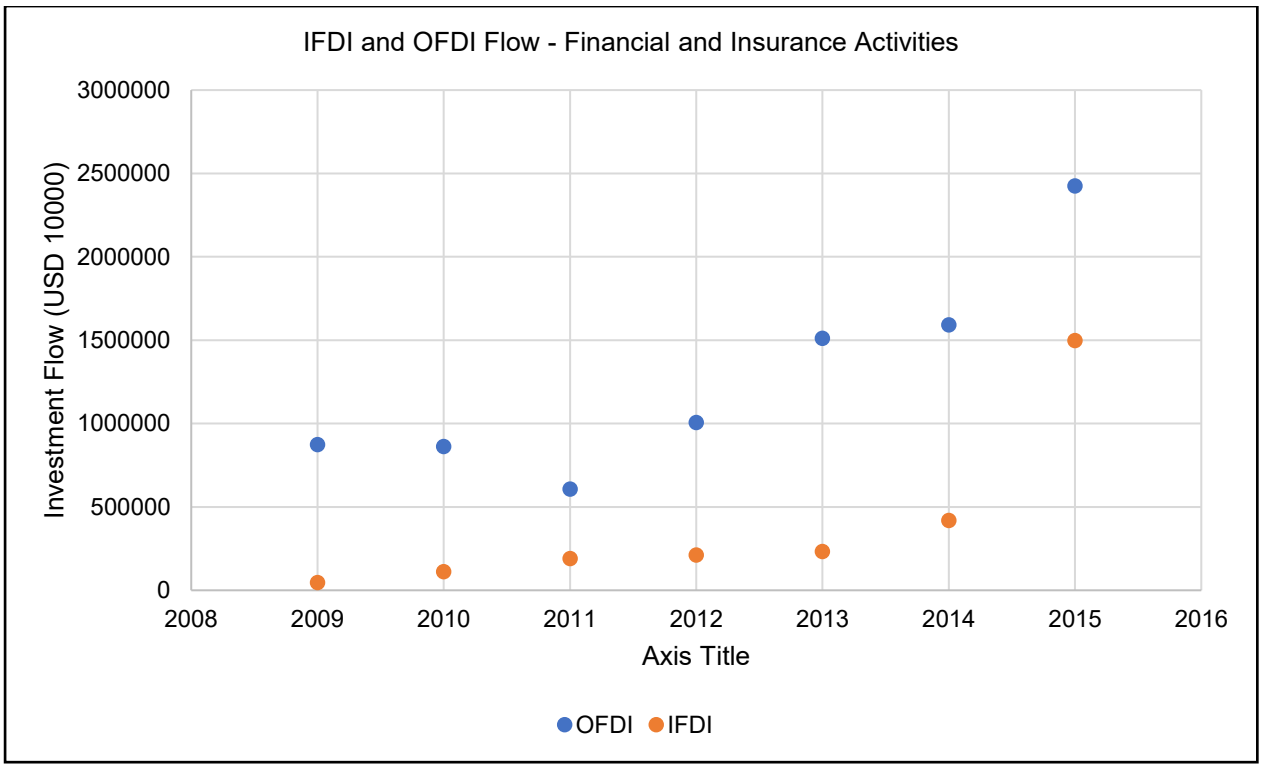
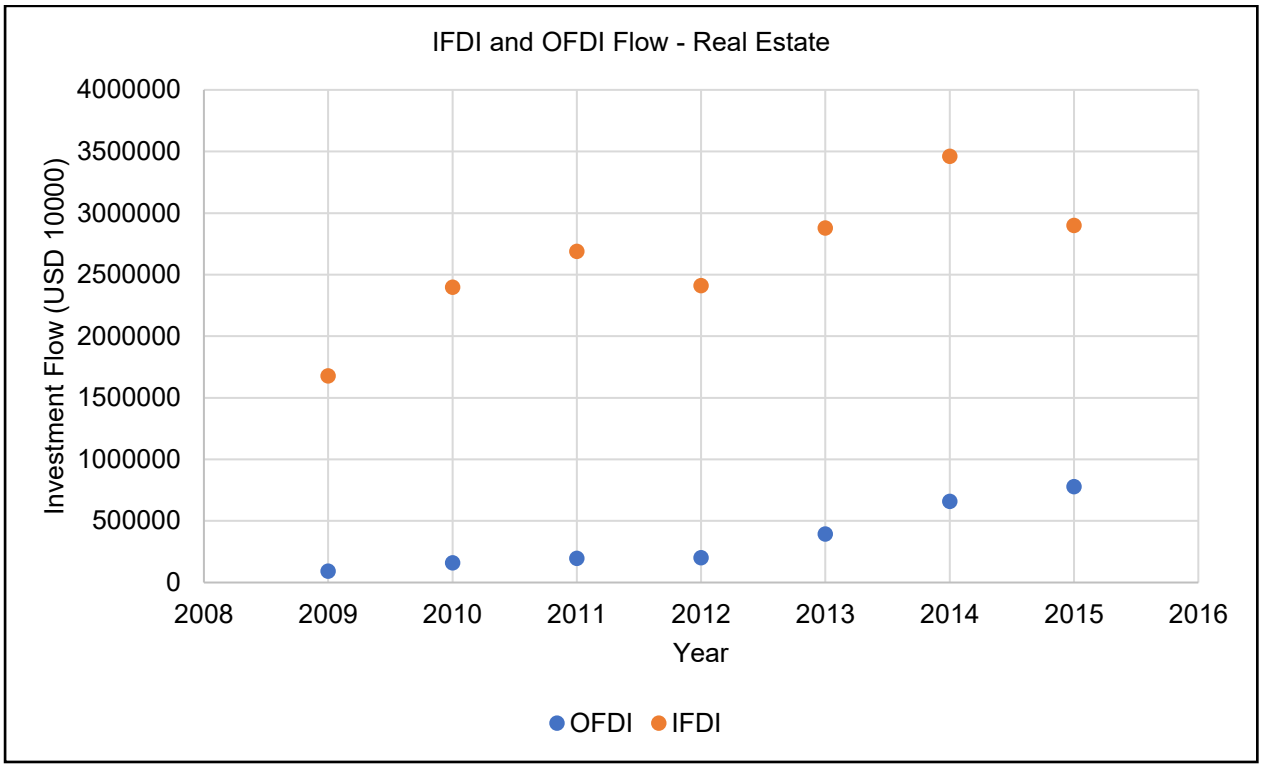


Figure 3. 11 IFDI and OFDI Flows 2009 to 2015 – Real Estate.



According to Figure 3.12, between 2009 and 2010, in the education sector, IFDI surpassed OFDI. However, from 2011 to 2012, OFDI grew significantly more than IFDI. Since the 1990s, the Chinese government has opened its shores to foreign investment in the education sector in a successful attempt to enrich its labour (Wu and Zha, 2018). It encouraged the establishment of several Sino-Foreign This policy effectively reduced imports, transferred technology, and enhanced the domestic sector. In time, the establishment of telecommunication and high-tech innovation in Chinese firms increased (Loo, 2004). More importantly, these firms possessed the capability to compete with existing foreign firms in China and globally.

Figure 3. 12 IFDI and OFDI flows 2009 to 2015 – Education.

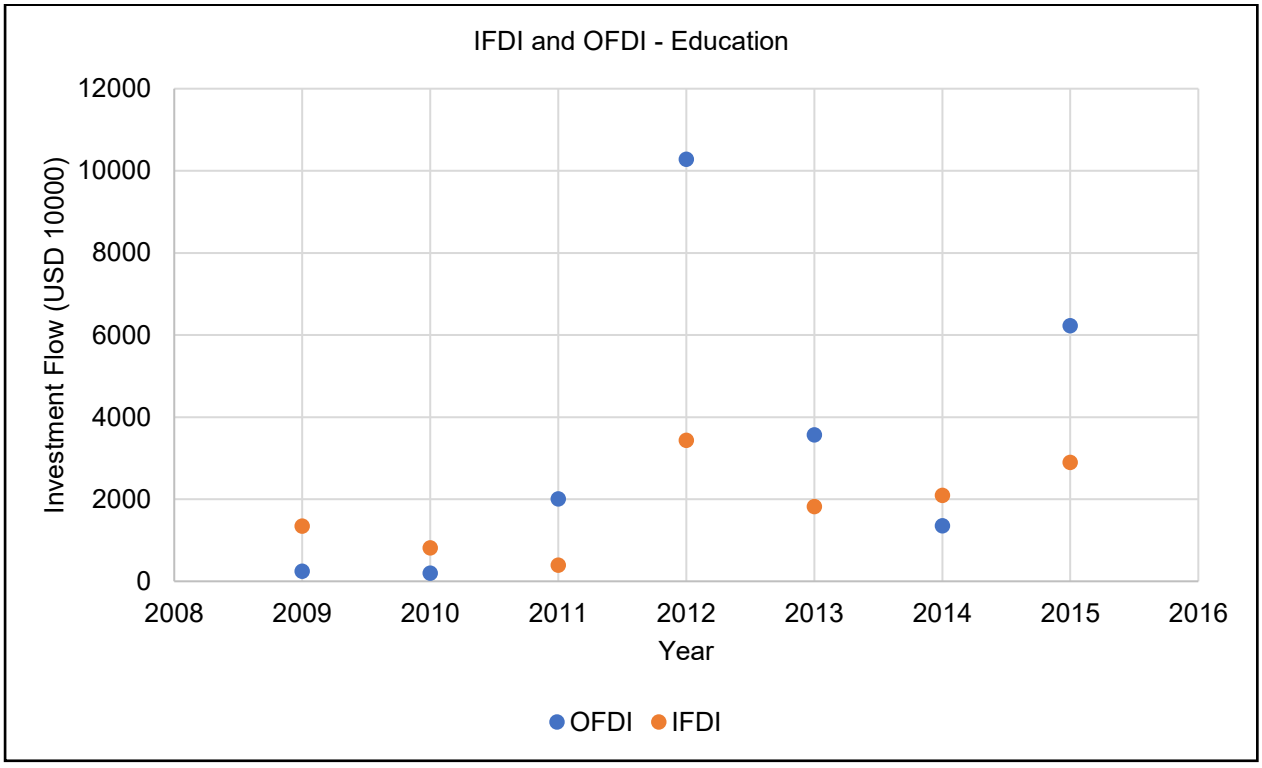
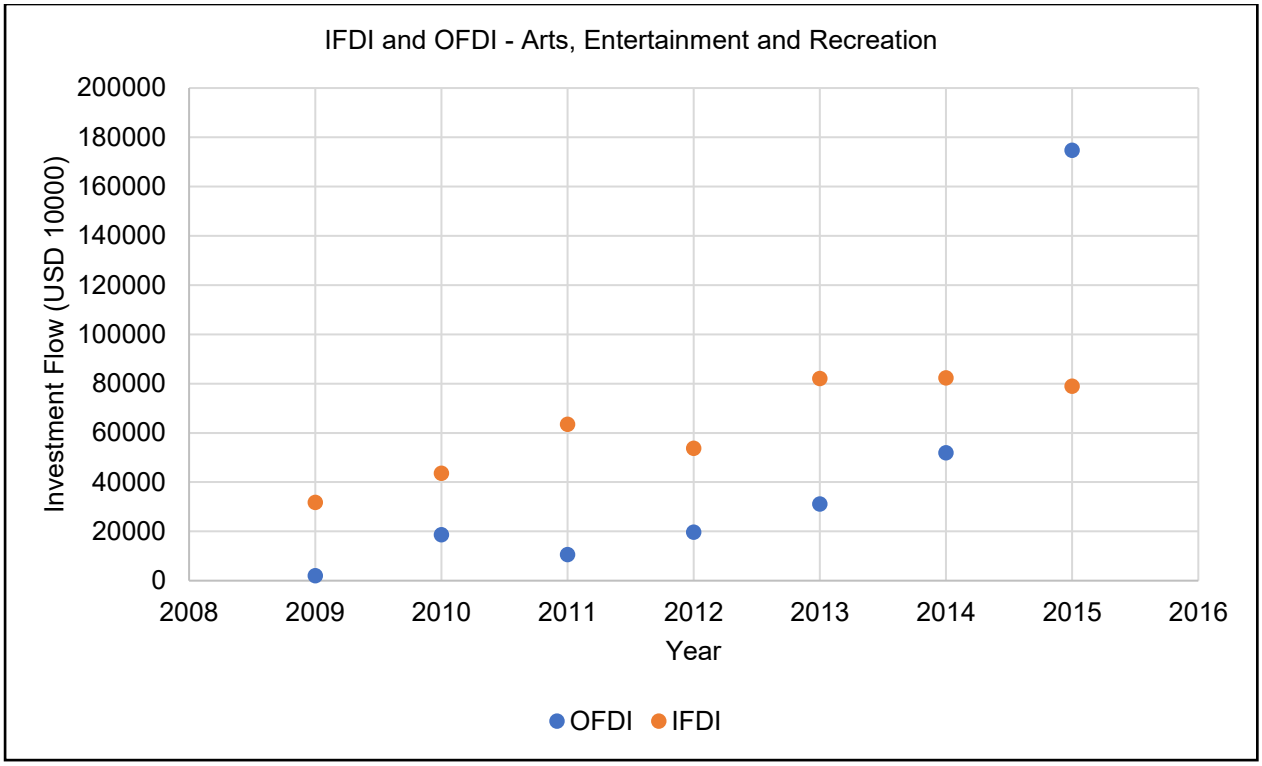


Figure 3. 13 IFDI and OFDI flows 2009 to 2015 – Arts, Entertainment, and Recreation.



Independent Variables

Table 3.2 gives an overview of the independent variables used in the estimations. These variables are $Capital_{it}$ which is a measure of capital formation; Market $Size_{it}$ which is proxied by GDP per capita; $TechCap_{it}$ (technological capability), which is measured by research and development; $Export_{it}$ and $Import_{it}$, which is measured by sector-level import and export and Labour $Prod_{it}$ (labour productivity) which is measured by labour cost, and trade openness measures by import plus export over GDP.

Table 3. 2 Independent Variables and Description

$Capital_{it}$	Capital is the proxy for capital formation at sector i at period t.
Market $Size_{it}$	Market size proxied by GDP per capita for sector i at period t. It is a proxy for the market size of the sector. The growth of an economy is reflected in the GDP of the home economy (Kakoti, 2019). Onyeiwu and Shrestha (2004) and Hadi et al. (2018) argue that GDP also represents the market size of an economy. Couglin and Segev (2002) believe that a high GDP is a push factor that encourages outward investment. Kakoti (2019) argues that GDP is considered an ownership advantage according to the OLI paradigm. Like Hadi et al. (2018), Couglin and Segac (2002), Kakoti (2019) and Shah (2013), we adopt sector-level GDP as a proxy for the market size and degree of economic development of each sector in the sample.
$TechCap_{it}$	This stands for the technological capability for sector i at period t. Measured by each sector's R&D expenditure (Pradhan, 2007), it is used to examine whether overseas investment and production are significantly affected by the technological capacity of China's sectors.
$Export_{it}$	This stands for exports for sector i at period t measured as sector-level gross exports.
$Import_{it}$	The logarithm of imports for sector i at period t is measured as a sector-level gross import.

(Labour Productivity) Labour $Prod_{it}$	This is measured as sector-level average wage, as proposed in Lai and Sarker (2021) and Donaubauer and Dreger (2018).
(Real Effective Exchange rate) $REER_{it}$	Real Effective Exchange Rate indices (GDP deflator based- Index Base 2005).
Trade Openness	Trade openness is defined as imports plus exports over GDP. This measure is based on studies such as Asiedu (2002), Buckley et al. (2007) and Wei et al. (2010)

Data sources

The data is secondary data collected from four databases. Sector-level data on inward and outward FDI was obtained from the CEIC China Premium database. The time period is constrained by the availability of data from source CEIC and ORBIS databases. Sector-level IFDI and OFDI data obtained from the CEIC database is limited as it is available up until 2015. This limits the data sample of the study as these variables are used to calculate the dependent variable, the Log share of OFDI/IFDI. The industrial classification of the variables needs to be considered when analysing sector-level data, and the industrial classification from this database is classified as the Chinese Economic Industrial 'GB/T4754-2002' classification (Holz, 2013). The data on exports and imports were collected from the Trade-in Value-Added (TIVA) OECD database. According to the OECD database, the data for imports and exports is under the International Standard Industrial Classification (ISIC) Rev.4. Like the CEIC, the ISIC is regarded as the international industrial standard of all economic activities and is the international reference classification of productive activities. Its primary purpose is to provide a set of activity categories

that can be used to collect and report statistics (OECD, 2008). REER is obtained from the World Bank database, where this variable is obtained in the form of annual national-level data. I obtain the sector-level data from three databases for capital formation, technology, and market size. Firstly, Chinese firm-level data on operating revenue, total assets, and R&D expenditure were obtained from the Orbis database to serve as measures for market size and capital and technology per sector. The data were exported and classified under the NACE Rev 2 industry classification. To adequately represent these variables in relation to the Chinese economy, national-level data on GDP, capital, and technology were obtained from UNCTAD and OECD. Finally, we aggregated the firm-level data to establish the sector-level data by integrating the national and firm-level datasets to obtain the sector-level market size, capital, and technological capability variables used in the analysis. Except for REER, the independent variables are all stated in per capita terms. A final step I took to ensure consistency in the data was to perform data concordance, which entails transforming one or more sector classification systems to correspond to another. In the case of this data, all the sector-level data was transformed to the International Standard Industrial Classification (ISIC) Rev.4. A summary of the list of sources and further details of the variables are given in Appendix A.

3.4.1 Preliminary analysis

Table 3.3 presents the descriptive statistics for the variables. It shows that the share of OFDI relative to IFDI (Share OFDI/IFDI) shows a minimum value of 0.288 and a maximum value of 586.12.

Table 3. 1 Descriptive Statistics

Variables	Observation	Mean	Standard Deviation	Min	Max
Share OFDI/IFDI	91	3.689	9.824	0.288	586.124
Capital	90	268004.8	565354.7	3.648	2816976
Market Size	90	561263.6	1090070	12.339	4666818
TechCap	81	24238.16	51300.49	9.332	248356.5
Export	84	154203.4	470272.6	64.83	2051347
Import	91	126412.9	256533	512.46	1169261
REER	91	110.7821	10.17963	100	129.931

Labour Productivity	91	8013.879	3504.697	2101.468	18430.7

Note: REER represents real effective exchange rate, and Tech Cap represents Technology Capability. Descitptivce statisitcs by sector can be found in Appendix B.

Table 3. 2 Correlation Matrix

	Share OFDI/IFDI	Capital	Market Size	TechCap	Export	Import	REER	Labour Productivity
Share OFDI/IFDI	1							
Capital	-0.0310	1						
Market Size	0.2592	0.3654	1					
TechCap	0.3789	-0.519	0.0551	1				
Export	0.3789	-0.449	-0.047	0.3190	1			
Import	-0.0469	-0.133	-0.004	-0.0954	0.6984	1		
REER	0.2998	-0.135	0.1256	0.1408	-0.181	-0.075	1	
Labour Prod	0.3475	0.2831	0.2212	-0.0196	-0.549	-0.260	0.4531	1

Note: TechCap represents Technological capability, REER represents real effective exchange rate, and Labour Prod represents labour productivity.

Table 3.4 presents the correlation analysis between the variables. The highest correlation is between import and export, 0.70, so there is no serious concern for multicollinearity. I should also point out that in addition to including imports and exports in the same equation, I also estimate equations with each of these variables independently, thus dispelling any minor doubts about multicollinearity.

3.5 Results and Discussion

Table 3.5 displays the results of the fixed effects estimation. All the variables have been transformed into log form to obtain a clear interpretation of the results. I explore four different models with different specifications. Firstly, in model 1, I follow the approach from Thomas and Narayanan (2017). In their study of the determinants of OFDI, they measure the trade openness of manufacturing firms by incorporating import and export into the model. This attempt was based on investigating the impact import and export play separately in relation to OFDI. Therefore, Model 1 estimates the effect of capital, market size, technology, export, import, labour

productivity, and REER on the share of OFDI relative to IFDI. In model 2, I examine the impact of market size, capital formation, technological capability, Export, labour productivity, and real effective exchange rate on the share of OFDI relative to IFDI. Model 2 deviates from Thomas and Narayanan (2017) and incorporates just export to the model. Additionally, I do not include imports in this model because we want to control for the possible multicollinearity in the model. Model 3 takes a similar approach to Model 2. However, I incorporate the import variable instead of exports. In Model 4, I take a different approach, consistent with the majority of the literature, such as Chakrabarti (2001) and, Rodriguez and Pallas (2008), and Kyrkillia and Pantelidis (2003). Similar to the aforementioned studies, I measure trade openness using the formula, import plus export divided by GDP.

By large, the results are similar for all four models. Thus, they serve as robustness checks that estimations provide sound results. The minor differences relate to incorporating imports and exports jointly, separately or as a measure of trade openness. In particular, when imports and exports are included together, imports does not appear to be significant at the conventional statistical significance levels, but is when allowed on its own. Given that findings from the four models are quite similar, I will now use the benchmark model, Model 1, to discuss the results for each independent variable and refer to all four models when discussing the findings for trade, given the slight differences.

Table 3. 3 Fixed Effects estimation results for Models 1, 2, 3 and 4

	Fixed Effects (1)	Fixed Effects (2)	Fixed Effects (3)	Fixed Effects (4)
Variables	**Log OFDI/IFDI**	**Log OFDI/IFDI**	**Log OFDI/IFDI**	**Log OFDI/IFDI**
Log Capital	0.499**	0.361	0.565**	0.489**
	(0.229)	(0.223)	(0.230)	(0.219)
Log Market Size	-0.506**	-0.407**	-0.503**	-0.0163
	(0.210)	(0.201)	(0.214)	(0.198)
Log TechCap	0.0544	0.00956	0.0432	0.0477
	(0.0762)	(0.0674)	(0.0773)	(0.0729)

Log Export	0.345*	0.418***		
	(0.202)	(0.137)		
Log Import	0.127		0.372***	
	(0.194)		(0.133)	
Log Trade Openness				0.487***
				(0.132)
Log labour Productivity	-1.080	-0.722	-1.205	-0.924
	(1.131)	(1.101)	(1.150)	(1.104)
Log REER	10.87***	9.530***	11.78***	10.20***
	(3.482)	(3.432)	(3.505)	(3.391)
2010	0.371	0.349	0.416	0.338
	(0.261)	(0.253)	(0.264)	(0.255)
2011	1.039**	0.883**	1.167***	0.976**
	(0.395)	(0.387)	(0.395)	(0.384)
2012	0.681*	0.578*	0.785**	0.614*
	(0.339)	(0.335)	(0.340)	(0.332)
2013	0.527*	0.479*	0.587**	0.480*
	(0.274)	(0.272)	(0.277)	(0.268)
2014	0.463*	0.423	0.535*	0.408
	(0.269)	(0.266)	(0.271)	(0.263)
2015	-	-	-	-
Mining and Quarrying	5.738***	5.177***	6.268***	5.435***
	(1.085)	(0.957)	(1.058)	(0.944)
Manufacturing	0.215	0.154	-0.446	0.0272
	(0.785)	(0.710)	(0.695)	(0.671)
Electricity and Water Supply	3.424**	3.196**	2.212*	3.083**
	(1.368)	(1.294)	(1.190)	(1.189)
Construction		4.432***		

		(1.044)		
Wholesale and Retail Trade	2.583***	2.353***	2.274***	2.501***
	(0.835)	(0.807)	(0.830)	(0.797)
Transportation and Storage	2.183**	2.034**	1.824*	2.058**
	(1.005)	(0.950)	(1.000)	(0.946)
Accommodation and Food Services	-0.301	-0.683	0.0514	-0.480
	(0.531)	(0.450)	(0.498)	(0.461)
Information and Communication	2.387	1.890	2.256	2.238
	(1.447)	(1.417)	(1.472)	(1.401)
Finance and Insurance	3.420*	2.808	3.180*	3.202*
	(1.778)	(1.724)	(1.806)	(1.710)
Real Estate	-0.0191	-0.436	-0.163	-0.143
	(1.035)	(0.987)	(1.051)	(0.973)
Education	1.440	0.928	2.165**	1.052
	(1.062)	(0.921)	(0.992)	(0.918)
Arts, Entertainment and Recreation	-0.0105	-0.371	0.278	-0.207
	(1.022)	(0.993)	(1.026)	(0.987)
Constant	-45.77***	-41.60***	-48.21***	-44.22***
	(8.421)	(8.215)	(8.453)	(8.037)
Observations	74	81	74	74
R-squared	0.973	0.970	0.971	0.974

Robust standard errors in parentheses - *** p<0.01, ** p<0.05, * p<0.10. Market Size is defined by GDP per capita, TechCap represents technological capability, and REER represents real effective exchange rate. Trade openness is defined as (Imports+Exports)/GDP. Dependent variables are highlighted.

Market size

Model 1 shows that market size is negatively and statistically significant and suggests that a 1% increase in market size will lead to a 0.506% decrease in the share of OFDI relative to IFDI. This finding rejects Hypothesis 1 and is in contrast to the majority of the literature, as studies such as Neuhaus (2006), Pegkas (2015), Alam and Shah (2013), and Kakoti (2019). One explanation could be linked to the fact that most studies use aggregate data; this study employs sectoral data. Further to this, the negative relationship is not unheard of in the literature, and the institutional context, Chapter 2, can be used to make sense of this result. As was discussed in the hypothesis development section, a buoyant economy can imply an increase in the cost of capital and labour (Buchanan et. 2012), which deter IFDI. Moreover, the negative and statically significant results play directly to the OFDI escapist argument, discussed in Chapter 2 (e.g. Luo et al. 2021), that firms pursue outward investment to avoid market or institutional limitations.

It is also important to note that China's regulatory environment is particularly unfavourable to private firms compared to SOEs, who, due to their government affiliations, have more lucrative concessions when seeking to pursue international investment. As China carry out a sweeping regulatory crackdown on the technology sector, the country's market becomes unfavourable to firms in these sectors. In line with this, Huang (2021) states that the Chinese government have slowly restricted private technology firms in the last decade, wiping off billions of dollars from the market capitalisation of some of the largest private companies in China. Huang (2021) further indicates that Chinese entrepreneurs are reportedly avoiding long-term investment amid rising uncertainty in the regulatory environment, jeopardizing prospects for innovation and further economic growth in China. Additionally, this explanation also plays to the regulatory constraints placed on sectors such as the real estate, entertainment and hotels sector, as these sectors predominantly serve China's domestic market and are restricted or partly prohibited from pursuing outward foreign direct investment.

Therefore, contrary to expectations, market size does appear to incentivise the share of OFDI to IFDI to increase. For developing and less-developing countries who are seeking to understand the drivers of OFDI to IFDI, the findings here need to be looked at with some caution. In particular, given the institutional context of China, as discussed in Chapter 2 and referenced in the discussions above, the institutional restraints on specific sectors may be influencing the findings.

Capital Formation

In the benchmark model, Model 1, Capital has a positive and statistically significant effect on the share of OFDI to IFDI. The results indicate that a 1% increase in capital will result in a 0.499% increase in the share of OFDI to IFDI. This result is consistent with Hypothesis 2 and with the literature (e.g., Dunning and Narula, 1996; Wei et al., 2010). Before the 1970s, inadequate capital was a key factor restricting China's economic growth. The implementation of its trade liberalisation policy was promoted using IFDI as a tool to enhance China's capital intensity. In the early stages of China's investment and development journey, foreign inflows in China improved the country's capital. As such, China was able to transform from a labour-intensive country in which primary sectors such as agriculture were dominant to a more capital-intensive economy in which secondary and tertiary sectors such as manufacturing, construction and finance are more prevalent (Iqbal and Turay, 2019; Kolstad and Wiig, 2012). In line with this, Wei et al. (2010) also argue that increased capital inflow due to the success of earlier IFDI increased the OFDI capability of Chinese MNEs as it substantially improved China's savings rate and contributed to monetary expansion. This ultimately enables Chinese sectors the capital advantage to pursue OFDI. The results also agree with Aivazian et al. (2005), who identify China as a capital-abundant country, and this abundance, as well as its high savings rate, increases the availability of financing for Chinese firms to invest internationally, leading to higher levels of OFDI. The result of the study also supports Huang and Wang (2015). It asserts that surplus capital can decrease the cost of capital, making it more affordable for firms to invest in foreign markets.

Technological Capability

For technology, the result shows a positive relationship across all four models. In Model 1, I find that a 1% increase in technological capability will result in a 0.0544% increase in the share of OFDI. However, this result is insignificant. This positive effect of technological capacity and OFDI is consistent with the literature (Pradhan, 2004; Wei et al., 2010; Dunning and Narula, 1996). Technology is an essential sector-specific asset because innovative sectors have first mover advantage in the domestic market and overseas production. Studies such as Lall (1980) find evidence of a strong association between R&D and overseas investment at both firm, sector and national levels. The majority of the literature that explores the impact of technology on OFDI is predominantly focused on advanced countries with high-tech technological innovations. Our study deviates from that of Lecraw (1977), Well, 1983 and Lall, 1983, which argue that

technological innovation enables OFDI in advanced economies and gives them monopolistic advantages that expand the profits of their international investment venture. We look to see if this is the case for China, as developing and emerging economies such as China are regarded as latecomers to the international market. Although most of the literature and our findings evince that technological capability and outward foreign investment have relations, our results show that the effect is not statistically significant. This result could be evidence that the Chinese sector's pursuit of international investment is motivated by acquiring and gaining technological assets and knowledge, thereby increasing the transfer of new innovative technology to China's sectors. While China has made considerable progress in recent years, it is still regarded as an emerging economy and still lags behind developed countries in terms of technology and innovation. By pursuing technology acquiring motivated OFDI, China can further narrow its technological gap and accelerate its technological development.

Trade and Trade Openness

As mentioned earlier, I use different measures of trade guided by the literature. The distinctions in the definitions of trade define Models 1 to 4 in Table 3.5. Essentially, in Model 1, imports and exports are included as trade measures. In columns 2 and 3, exports and imports are included sequentially. In model 4, trade (trade openness) is defined as (imports + exports)/GDP. Across all four models, all the different measures of trade show a positive relationship with the OFDI/IFDI. In the benchmark model, Model 1, only exports is significant and not imports. When imports and exports are allowed in the model sequentially, Models 2 and 3, they display statistical significance. Similarly, in model 4, trade openness displays a statistically significant relationship with OFDI/IFDI.

Delving more into the details of the models, the positive and statistical significance of exports in the models suggest that the export orientation of sectors is likely to affect the OFDI decisions, thereby supporting hypothesis 5a but rejecting 5b. Firms in sectors with export experience are expected to have better information regarding foreign markets, distribution networks, consumer tastes and preferences, and target countries' institutional structures. The information attained during exporting helps firms undertake OFDI (Thomas and Narayanan, 2017). SOEs and private Chinese firms that have been successful in pursuing outward investment in other Asian countries, Africa, and North and South American countries first approached the venture through export (Hou et al., 2022). The finding of this exercise aligns with Turkan (2006) and Dunning and Naraula (1996), who argue that exports and OFDI are complementary. Our empirical findings

support the propositions of the IDP model by Dunning and Narula (1996) and Pradhan (2004). Additionally, international production may follow exports, where exporting firm starts manufacturing overseas because of a perceived threat of market loss. Further, exporting can result in OFDI when firms use the investment to set up distribution, finance and marketing networks (Hou et al., 2022).

In Model 3, when imports is included on its own, it shares a positive and statistically significant influence on the share of OFDI relative to IFDI, thereby supporting hypothesis 4. The finding is consistent with most of the literature, as importing technology and products provides domestic sectors with important advantages in transferring foreign-developed technologies to domestic Chinese firms. It is also likely that the importation of technology was aimed towards filling the technological gaps that existed in their domestic sectors. This ultimately enhanced their innovative capabilities (Buckley et al., 2007). This is particularly so in China's knowledge and technology-based sectors. Additionally, through the IDP theory (Dunning and Narula, 1996), during the first stage of China's investment development path, China allowed the inflow of technology-based production inputs and products in order to facilitate their domestic economy through reverse engineering the products and learning. Through this mechanism, Chinese firms were able to enhance their technological assets and capabilities. This enabled Chinese sectors with the technical and innovative ability to pursue international investment opportunities.

In Model 4, when trade openness (imports + exports)/GDP is used as the measure for trade, a positive and statistically significant effect on OFDI/IFDI is observed, thereby supporting hypothesis 5c. The 1970s trade liberalisation policy was the first step to opening the country to the global market. China's expansion of its trade activities gave its domestic sectors more exposure to foreign markets. Increased exports assure the existing market and lower the risk of outward international investment. The opening of China's economy also contributed to its economic transformation and restructuring of China's sectors, which is directly related to its OFDI success.

Overall, therefore our models convincingly show that trade, in all its forms, has a positive influence on OFDI/IFDI.

Labour Productivity

Model 1 also shows that labour productivity has a negative but insignificant effect on OFDI/IFDI. Therefore, we do not find any support for hypothesis 7. According to the IDP theory, countries transitioning through the investment development path move from labour-intensive to capital-intensive processes. Donaubauer and Dreger (2018) indicate that the labour force of emerging countries like China become more skilled and advanced, resulting in higher labour costs. Higher labour productivity means that workers can produce more goods and services per hour of work, which can maximise profit. The increased capacity and skill of the labour force increase the capability of MNEs to pursue international investment. However, the result of this study is not in line with the existing literature. However, I should note that most of the literature looks at the relationship between labour productivity and OFDI, but not OFDI/IFDI, where labour productivity may be exhibiting differing influences on IFDI and OFDI, as discussed in the hypothesis development section.

Real Effective Exchange Rate

In Model 1, the results show that the real effective exchange rate (REER) has a positive and statistically significant effect on OFDI/IFDI and in particular, a 1% appreciation in the exchange rate will lead to a 10.87% increase in the share of OFDI. Thus, this result provides support for hypothesis 6. The finding is consistent with the literature (Cushman, 1985; Pantelidis and Kyrillis, 2005). Furthermore, these results are also in line with the capital market imperfection theory such that China's appreciated exchange rate relative to the host country creates a disequilibrium causing the factors of production in the target economy to be cheaper for Chinese MNE. This ultimately increases the propensity for Chinese firms to pursue outward foreign investment. Governments and firms consider this a cost-reducing and profit-maximising strategic decision, further increasing the potential for enterprises to conduct OFDI. Feng et al. (2022) indicate that RMB exchange rate measures the relative prices of goods and factors between countries. Also, it presents the cost changes of Chinese firms' investment in international markets and plays an important role in OFDI (Helpman, 2004). In line with this, Huang and Chen (2018) accentuate that the home country's exchange rate appreciates, and more lucrative opportunities for OFDI will occur as foreign currency-dominated assets become cheaper. Buckley (2007) also argues that it is probable that a rapid appreciation of the exchange rate from an undervalued position will more than proportionally increase OFDI. Before 2005, China

adopted a fixed exchange rate policy which comprised the Yuan Renminbi (RMB) being pegged to the dollar at a constant nominal level (Buckley et al., 2007). At this stage, China's currency was stated to be significantly undervalued (Das, 2019).

In July 2005, China moved to revaluate its currency by announcing moving away from a fixed exchange rate. China began exploring steps to a more flexible exchange rate as exchange rate stability became crucial to its economic strength. This is because a flexible market-oriented exchange rate was needed to aid in absorbing external shocks and maintain China's ability to use monetary policy to affect domestic economic conditions (Das, 2019). As a result, the Chinese government transitioned from a fixed exchange rate to a flexible exchange rate regime based on market supply and demand with reference to a currency basket (Buckley et al., 2007; Das, 2019). The 2005 reform was followed by a 2.1% appreciation of the RMB against the dollar (Das, 2019). Based on this exchange rate reform, Feng et al. (2022) indicate that it is necessary to analyse the impact of China's exchange rate appreciation on OFDI, as it is crucial to informing internationalisation strategy.

In addition to the mechanism described above, exchange rate can increase OFDI in other ways. First, currency appreciation involves a higher price for exported commodities, Campa and Goldberg (1999), which may decrease their competitiveness in global markets and lead to decreased profitability. To hedge against for lower profitability, enterprises will be more willing to increase ODFI (Feng et al., 2022). Second, currency appreciation reduces the price of imports, expands the domestic market share, and intensifies competition. To prevent this, some firms choose to pursue international opportunities. Finally, currency appreciation facilities corporate financing.

3.6 Conclusion and Policy Implication

From the 1970s until the late 1990s, China was regarded as a destination for IFDI for foreign MNEs. However, it has undergone a structural transformation brought about by earlier IFDI and government policies to enhance the macroeconomic conditions of its domestic sectors and promote the ownership advantages of domestic Chinese firms. These factors have strengthened the ability of firms in China to pursue international investment opportunities, and it has transitioned from a predominantly host country to a home country for its own MNEs. While many studies investigate the determinants of IFDI and OFDI, there are barely any studies that look to

understand the determinants of OFDI/IFDI. Understanding this is crucial for countries, particularly less developed and developing countries, which aim to reach a higher level of economic prosperity by increasing their share of OFDI in relation to IFDI, as predicted by the IDP theory. There are not many countries where OFDI has reached a significant level, so that studies can be conducted to understand the drivers of OFDI/IFDI. Although at an aggregate level, OFDI only temporarily surpassed IFDI, at a sectoral level, this OFDI has exceeded IFDI and maintained this tendency in many sectors. Therefore, the sectoral-level Chinese data provides us with a unique opportunity to investigate the drivers of OFDI/IFDI. To the best of my knowledge, this is the first study to conduct such an investigation. Through using a dataset comprising 13 of China's sectors from 2009 to 2015, this study explores factors (market size, technological ability, labour productivity, capital, exports, imports and exchange rate) that can potentially contribute to China's increased share of OFDI relative to its IFDI. The findings are, to some extent, consistent with the literature on the determinants of IFDI and OFDI but additionally provide insights into the drivers of OFDI/IFDI, especially from the context of China's institutional set up.

Over the last four decades, China has been the most successful among developing and emerging economies in increasing its share of OFDI to the point that it exceeds IFDI. The findings suggest that the capital intensity in China contributes to its ability to pursue international investment. China has been able to restructure its labour-intensive sectors to incorporate high capital-intensive production processes. These are often associated with high technological and innovative practices translated into sector- or firm-specific ownership advantages. This level of production is also associated with increased efficiency when developing products and services. This increase in the capital intensity of Chinese sectors enables Chinese MNEs to compete globally and actively seek foreign investment opportunities to gain China access to more advanced foreign technology, expand their markets and further increase efficiency. The inflow of capital from earlier IFDI has also enabled the Chinese government's savings rate and facilitated monetary expansion to encourage Chinese MNEs to pursue OFDI/IFDI. In the analysis, I also find evidence that export and import intensity has a positive impact on OFDI/IFDI. In regards to export, I find that export plays a complementary role to OFDI in China. This is predominantly focused on market-seeking OFDI by Chinese MNEs. In order to gain information on demand and supply conditions and their legal system or assess the possible risk of investment in a potential market, Chinese MNEs will first pursue exporting to the market and use the knowledge obtained to formulate strategic OFDI decisions (Buckley et al., 2007). Also,

through external networks like export, Chinese MNEs can comprehend the external business environment and effectively exploit lucrative international business opportunities.

Regarding imports, I find evidence that they have a positive effect on OFDI/IFDI. In the early strategy of China's integration into the global economy, it encouraged imports of products and new technology. In developing and emerging economies, imports can be a primary source of new technology and modern production machinery that domestic firms can use. They imitate imported technology to enhance their ability to domestically create these technologies and products. This increased ability enhances the ownership advantages of domestic firms. In addition, China's implementation of trade and foreign investment policies, such as the Joint Ventures Act in 1979 and joining the WTO in 2001, promoted China's rise to become a major global investor.

I also find evidence that China's exchange rate positively influences its OFDI/IFDI. China transitioned to a floating exchange rate regime in 2005, which appreciated the yuan Renminbi (RMB). As China's exchange rate rises, more profitable opportunities for OFDI occur as foreign currency-dominated assets become cheaper. In contrast to the existing literature, my results show that market size has a negative effect on the increased share of OFDI/IFDI. However, this is possibly due to market limitations in some of China's sectors, such as its mining and quarry sector. As a result of the scarcity of natural resources in China, the demand for precious minerals and metals does not match the supply in the domestic market. Therefore, Chinese MNEs are encouraged to pursue international investment opportunities in resource-rich countries. In the robustness checks, when adopting NOI as a measure for outward investment, this chapter also shows that China's sectors' labour productivity also contributes to its OFDI success.

Based on the study, several policy implications for China have been put forward. Firstly, China's government support and macroeconomic stability are crucial to maintaining its competitive position in the global market. Due to their government affiliation, SOEs have more macroeconomic support to pursue international investment. Policies that create an enabling environment for outward FDI for private firms can be beneficial to China's overall economic development. This can be done by relaxing administrative barriers, streamlining regulations, and promoting private Chinese firms' international investment opportunities. Secondly, by encouraging investment in strategic sectors. The regulatory framework of China has limited specific sectors which private firms encompass. For example, sectors such as the hotel, real estate and entertainment sectors have been restricted. China can further enhance its presence

in the global market by encouraging investment in strategic sectors. Thirdly, to improve business relations overseas, the Chinese government should implement legal compliance policies for Chinese MNEs to ensure the companies adhere to social responsibilities and legal and ethical regulations of the overseas economies conducting business. This includes sanctions on Chinese MNEs that go against international copyright laws and protectionist environmental policies. Finally, enhancing non-exploratory international relations to facilitate more trade agreements channelled to promote economic development in developing countries, such as the Belt Road initiative.

This study's findings also have policy implications for less developed and developing countries currently in the initial stages of attracting IFDI. As predicted by the IDP theory, countries will be able to reach higher stages of economic development if their share of OFDI increases in relation to IFDI. For that, less developed and developing countries can influence key variables, particularly capital, trade openness and currency (appreciation).

3.7 Limitation and Future Research

Although this chapter established a comprehensive view of OFDI in China, our study finds the following limitations. Firstly, the study conducted is based on small sample size. After compiling and constructing the dataset, the data contained 91 sector-year observations used in the analysis. As such, there were certain limitations concerning the estimation methods. Secondly, because of data limitations, we were only able to investigate how home country macroeconomic determinants impact China’s transition to an outward investor using data from a more extended period. Also, because the data obtained from Orbis stopped in 2015 at the time of the study, we are unable to capture current events that impacted international investment in China, such as the COVID pandemic. Finally, because of data limitations on institutional variables at the sector level, our study does not incorporate institutional variables to examine how home country institutional factors impact OFDI directly.

We propose the following direction for future research based on this chapter’s research limitations. Firstly, I proposed the adoption of a more extensive sector-level dataset, which comprises subsectors in China that contribute to China’s outward investment. Secondly, future research should look towards a more extended data period in order to capture how significant shocks to the global value chain, like the COVID pandemic, impact international investment in

emerging economies. In our study, we consider home country push factors that affect outward investment in China. However, it would also be beneficial to incorporate how pull factors in the host country impact the decision for Chinese MNEs to pursue international investment. Studies such as Buckley et al. (2012) indicate that host country characteristics have a pull effect while, at the same time home country's pull factors contribute to MNE's outward investment decision. Therefore, a clear understanding of which of these factors have a more significant influence on China's outward FDI will be a noteworthy contribution to existing research.

CHAPTER 4 THE EFFECTS OF LEVERAGE ON THE INTERNATIONALISATION OF CHINESE FIRMS

4.1 Introduction

In the field of corporate finance, capital structure is one of the most debated and studied concepts. The finance literature has exhaustively theorised and discussed how firms determine their choice and amount of internal financing, debt and equity to finance investment projects (Myers, 2001; Dudley, 2012). Capital structure is a crucial element for companies because it affects the firm's financial flexibility and investment capabilities and gives a signal to the market, which can ultimately affect the firm's value. Capital structure attempts to explain the specific mix of leverage (debt) and equity companies use to fund operations and investments (Meyer (2001), Bevan and Danbolt (2010). First posited by Modigliani and Miller (1958), the idea of capital structure was based on the proposition that firm value and investment are irrelevant to capital structure in a perfect market, a point that is debatable given the imperfect nature of capital markets. However, their study serves as a starting point for all subsequent capital structure research.

Numerous studies have explored the capital structure and investment dynamics by relaxing Modigliani and Miller's assumptions, leading to theories including agency theory (Jensen and Meckling, 1976) and pecking order theory (Myers, 1984). A number of research topics are discussed within the context of capital structure. These include the determinants of capital structure (Tittman and Wessels, 1988; Chen et al., 2014), leverage and firm performance (Chagnati and Damanpour, 1991; Salim and Yadav, 2012; Danso et al., 2021) and how managerial decisions affect leverage and investment (Hutchison, 1995). Many focus on ascertaining the extent to which leverage affects investment (Lang et al., 1996; Ahn et al. (2004), Mittoo and Zhang (2008), Dudley (2012) and Duran and Stephen (2020)Aviazian et al., 2005; Adiputra and Hermawan, 2018). Studies focus on leverage as it is cheaper in comparison to equity issuance and allows greater financial flexibility. It is also a finite capital source that legally obligates the company to a fixed promised cash flow. In terms of capital structure, the focus of the current study will also be on leverage.

Harris and Raviv (1991) argue that the effect of leverage on investment falls in the scope of the agency theory of over- and underinvestment. According to agency theory, leverage reduces investment (Firth et al., 2008; Ahn et al., 2004). In underinvestment, managers of highly

leveraged firms may be induced to forgo lucrative investment opportunities because most of the investment returns may accrue to the debt holders (Firth et al., 2008). Jensen (1986) and Aivazian et al. (2003) argue that debt is used to discourage management from making non-profitable investments. In this situation, debt obligates firms to pay cash as interest and principal. Such debt commitments in low-growth firms can reduce managerial discretion over cash flow that may otherwise be allocated to non-profitable investments. The overinvestment theory suggests that managers tend to invest excessively in projects or assets beyond what is optimal for the firm or its shareholders (Firth et al., 2008). This problem arises when managers (agents) make decisions that may not align with the best interest of the shareholders (principals). In this case, leverage is used as a control and governance mechanism for shareholders to ensure the financial discipline of the managers, increase monitoring and facilitate shareholder alignment (Harris and Raviv, 1991).

Despite the extensive body of research, most studies seem to focus on leverage and domestic investment within the context of developed economies. Only a handful of studies investigate leverage and internationalisation/international investment. Egger and Kesina, 2013 investigate the link between leverage and exporting. Alexandridis et al. (2020) examine the link between the financial policy of shipping companies in North America and their corporate investment decisions using a probit estimation method and Compustat data from 1990 to 2008. They find that higher debt levels reduce the probability of pursuing international acquisitions. Hu and Yang (2016) examine leverage and cross-border M&A in a panel of 57 countries from 1990 to 2010 using a sample of 85,560 firms obtained from the Security Data Corporation (SDC) using a probit model. They found that firms with higher leverage are less likely to acquire foreign firms, which is more prominent in Asian than North American economies.

Despite the differences portrayed between advanced economies and developing countries by the aforementioned study, there is very little work conducted on examining the link between leverage and internationalisation. The preceding chapters discussed the importance of internationalisation in helping developing countries attain higher economic development. Therefore, understanding whether leverage can help increase the level of internationalisation is an important topic to study from the perspective of emerging economies. (Egger and Kesina, 2013; Kiendrebeogo and Minea, 2017; Nakhoda, 2017; Pacheco, 2018; Wagner, 2019; Erkol et al., 2020). In emerging economies, Tripathi and Thukral (2018) investigate the effect of firm ownership advantages on OFDI, especially debt financing capability and industry advantages. By employing a random-effects probit model on a dataset of 88 parent firms from 2008 to 2014

obtained from the Reserve Bank of India, the study finds that firm-specific ownership advantages have a more significant effect than industry-wide advantages. Tripathi and Thural (2018) suggest that an MNE's firm-level advantages, such as the ability to obtain debt facilities, increase the financing capacity of firms seeking to pursue international investment. This chapter contributes to this body of literature by using a novel firm-level cross-border M&A ownership dataset of both developed and emerging economies.

Given the discussions in the preceding paragraph, this study intends to contribute to the understanding of the linkage between leverage and internationalisation, and it will do so by focusing on China. There are a number of reasons for focusing on China. (i) As discussed before, very little work exists on this topic from the perspective of developing economies. The study of leverage and internationalisation by emerging market MNEs creates an opportunity to enrich the existing literature on firms' internationalisation in emerging economies. This will extend the understanding of internationalisation in emerging markets, especially in financial and capital structure decisions. China not only fits in the category of developing countries but is also among the few developing countries that have been able to generate a substantial amount of outward investment, as illustrated in Figure 1.1 in Chapter 1. As discussed earlier, leverage can be used as a mechanism to counter overinvestment problems and may also reduce future investment. The empirical literature predominantly supports these theoretical arguments by showing a negative relationship between leverage and investment (domestic and international). However, China is very different, especially in the context of its institutions and Go-Abroad policy. As discussed in the preceding chapters, the Go-Abroad policy of the Chinese supports its domestic firms to internationalise. A significant number of firms and banks are state-owned enterprises. Therefore, from the perspective that the government is encouraging and supporting its firm to internationalise and a lack of proper governance mechanisms and soft budget constraints, particularly in SOEs, it is not a priori clear that a negative can be expected between leverage and international investment.

This study makes two further contributions to the literature. First, it uses a dataset that comprises both listed and unlisted companies and contains financial data of about 200,000 observations in China from 2009 to 2017. Given the fact that I am using firm-level data, I will use Mergers and Acquisitions (M&A) as a measure of internationalisation. The data contains information on firms that were not MNES at time t=0 but did become MNEs at time t=1. Firms become MNEs at time t=1 by acquiring subsidiaries all over the world. The dataset contains information on the subsidiaries, including their locations, which are used in building the econometric model. As far

as I know, no study has used this dataset to investigate this topic in emerging economies. Second, this study adopts the novel method of using a linear probability model, which allows us to incorporate high dimensional fixed effects into the model to account for heterogeneity in both the parent and subsidiary firm, country-specific factors constant across time, country-specific factors that change across time, and time-specific factors in contrast to other commonly used methods such as probit and logit.

4.2 Theoretical perspective

Capital structure decisions concerning firm performance and investment are essential topics in international business and corporate finance literature (Aivazian et al., 2005). Financial managers have grappled with identifying the optimum level of internal financing, debt, and equity to employ to pursue investment opportunities and ensure high firm performance (Sibinidi, 2016). Modigliani and Miller (1958) pioneered the theory of capital structure and firm investment. According to Modigliani and Miller (1958), investment is determined by a firm's production technology, market interest rate, profitability, cash flow, and net worth. The theory also assumes that in a frictionless or perfectly efficient market with no tax or bankruptcy costs, no transaction costs, and no restrictions on institutions, a firm's capital structure is irrelevant to the value of the firm and its investment decisions (Miller and Modigliani, 1985). Although such a market is an ideal environment, it is not representative of what exists. The impact of capital structure on investment decisions cannot be dismissed because the idea of a frictionless[10] market is implausible (Aivazian et al., 2005; Firth et al., 2008). The environment that represents the financial market is one where the risk of bankruptcy and agency costs is a reality, and firms are required to pay taxes (Chakraborty, 2010).

The neo-classical position of Modigliani and Miller has been theoretically and empirically challenged in the literature. Subsequent modifications to the theory prove that their concept of a perfect market does not exist, and imperfections such as taxes, cost of financial distress and especially regulations that govern financial institutions impact capital structure and investment decisions (Froot and Stein, 1998). The pecking order theory deviates from their propositions and

[10] Frictionless capital market refers to a situation where transaction costs and institutional restrictions on asset trades are non-existent (Modigliani and Miller, 1958)

is consistently cited in the literature as the theory that best explains capital structure and financing decisions (Myers, 1984; Frank and Goyal, 2003). Concerning capital structure and investment, agency theory predicts that the effect of capital structure on investment decisions can be described through the concepts of underinvestment and overinvestment (Firth et al., 2008, Aivazian et al., 2005)

Next, I will describe the concepts of underinvestment and overinvestment, which could be viewed through the lens of agency theory. These concepts will guide the analysis and empirical findings in this Chapter. However, distinct from Aivazian et al. (2005) and Firth et al. (2008), who explores the impact of capital structure on domestic investment, this chapter aims to examine the extent of the overinvestment and underinvestment hypothesis applies to the context of international investment. The pecking order theory will also be explored to comprehend the theoretical perspective behind the financing decisions.

4.2.1 Agency Theory

Agency theory is based on agency conflicts and information asymmetry[11] between managers, owners, and debt holders (Jensen and Meckling, 1976). To explain the capital structure and investment nexus, Myers (1977) highlights that the difference in interest between principal and agent, i.e., agency conflict, can result in underinvestment and overinvestment problems.

4.2.1.1 Underinvestment Theory

Myers argues that given agency conflicts, highly leveraged firms with high-growth possibilities forgo investments with high net present value (NPV). The idea is that the shareholders and management of highly leveraged firms have a reduced incentive to pursue investment projects with positive NPV since the payoffs are accrued, at least partially, to debtholders rather than accruing wholly to the shareholders (Aivazian et al., 2005). Consequently, highly leveraged firms are less likely to exploit investments with high-growth opportunities than firms with low leverage levels. This is underinvestment bias or debt overhang.

[11] Information asymmetry occurs when management generally has more information on the financial position and the firm operation than shareholders.

According to Lang et al. (1996), if future growth opportunities are anticipated early, the firm's management can reduce the potential effects of underinvestment by a highly leveraged firm. Subsequently, the firm's management will make financing decisions seeking to lower the debt level ex-ante the future investment opportunity (Aivazian et al., 2005). Danso et al. (2019) indicate that reducing a firm's leverage can be achieved through debt covenants or shortening the maturity composition of debt in order to mitigate underinvestment issues. According to Garven and MacMinn (1993), debt convents [12] are structured contractual agreements between shareholders and bondholders which can mitigate financial agency problems such as underinvestment. Gamba and Triantis (2014) emphasise the effectiveness of two debt covenants used to mitigate underinvestment bias. An asset sweep covenant is an agreement that requires shareholders to use earnings from asset sales to make down payments, hindering asset sales designed to fund shareholder payouts. The second is a financial accounting covenant which is violated if the firm's debt-to-earnings before interest, tax, depreciation and amortisation (EBITDA) ratio surpasses a specified figure. Garven and MacMinn (1993) also state that the underinvestment problem is also purchasing an insurance policy that ensures that the net payoff from investments must be guaranteed to cover at least promised debt payments. In relation to the maturity structure of debt mitigating underinvestment problems, Meyers (1977) indicates that short-term debt[13] serves as a possible solution. The idea is based on the concept that if all debt matures before the investment decision, firms can pursue investment opportunities without the burden of debt (Diamond and He, 2014). Therefore, the underinvestment hypothesis postulates that firms that have high-growth potential should reduce the degree of debt financing and leverage when pursuing investment opportunities. In international investment, especially cross-border M&A, Hu and Yang (2016) suggest that highly leveraged firms are restricted by financing frictions that restrict the capability of highly leveraged firms to acquire targets in aggressive bidding acquisitions or hostile takeovers (Uysal, 2011). Debt holders are reluctant to issue further debt to overleveraged firms, and this can affect cross-border M&As. Finance restrictions also reduce the cash component and percentage of acquisition offered in the payment method and reduce the return and performance of the M&A.

[12] Debt covenants serve as an alternative strategy to mitigate underinvestment problems. Smith and Warner (1979), Nash et al.(2003) and Chava and Roberts (2008) explore the effect of debt covenants on investment.

[13] Short term debts are also regarded as current liabilities and are financial obligations that mature in a short period of time. Long term debt has a longer maturity and increases the leverage of a firm (Jungherr and Schott, 2020).

4.2.1.2 Overinvestment Theory

The second problem is the overinvestment problem, which results from agency conflict between management and shareholders (Aivazian et al., 2005). The argument is that managers will pursue self-interest by expanding the scale of the firm even if it results in engaging in projects with negative NPV and reducing shareholder wealth (McConnell et al., 2005). Essentially, Stulz (1990) asserts that irrespective of the degree of risk associated with the investment, managers will be induced to invest too much when cash flow is high and when cash flow is limited.

Debt financing is used as a corporate governance mechanism to mitigate overinvestment bias (Stulz, 1990). Jensen (1986) suggests that, given the availability of free cash flow, the use of debt may operate as a tool to discipline managers. The issuance of debt commits the firm to pay cash as interest and principal, compelling managers to fulfil such commitments with funds finances that may have otherwise been allocated to investment projects with poor NPV. Hence managers are motivated to pursue investment opportunities that earn high returns that exceed the firm's cost of capital rather than overinvest in risky projects (Danso, 2019). Firth et al. (2008) indicate that this is especially true for low-growth firms. Danso (2019) believes that shareholders and debt holders perform a beneficial monitoring and disciplinary role in low-growth firms where a high level of debt can limit the overinvestment bias caused by managerial agency problems.

Additionally, Aivazian et al. (2005) indicate that overinvestment is more prevalent in larger firms and state-owned firms. This is because managers have greater discretion over investment decisions and may pursue their own interests at the expense of the shareholder. Aivazian et al. (2005) also indicate that in relation to China, SOEs are predominantly larger than private firms and, as such, have the capacity to pursue international investment opportunities irrespective of their positive or negative NPV.

Both overinvestment and underinvestment can be mitigated by effective corporate governance, such as a strong board of directors, performance-based incentives, and transparency in decision-making. In larger firms, a strong board of directors can monitor and oversee investment decisions, while performance-based incentives can align the interests of managers with those of shareholders (Lin and Wu, 2022). Additionally, in smaller firms, transparent decision-making can increase the confidence of investors and lenders, making it easier to access capital (Lin and Wu, 2022). A firm's capital structure and investment decision can thus be explained through agency theory. This is based on the assertion that leverage can be an inhibiting factor that results in underinvestment or a solution to overinvestment. Either way, agency theory postulates a

negative correlation between leverage and investment. This chapter thus adopts this theory to ascertain its relevance to international investment.

4.2.2 Pecking Order Theory

The pecking order theory of capital structure is one of the most important theories in explaining a firm's financing choice. Myers (1984) and Frank and Goyal (2003) argue that firms prefer retained earnings to external financing when seeking to pursue investment opportunities due to the costs associated with information asymmetry and agency problems. However, when internal financing is limited and external financing becomes necessary, firms prefer debt to equity (Frank and Goyal, 2003). Guad et al. (2005) and Mazur (2007) argue that transaction costs also play an important role in a firm's capital structure decisions and that these costs are higher for external financing than for using retained earnings. In choosing between internal financing or debt, the cost of capital is less for internal financing because debt is associated with potential agency costs[14]and financial risk. Shareholder profits are greater when internal financing is used instead of equity. Miglo (2011) states that when a high-performing firm issues equity to finance investment, the securities of high-performing firms can be mispriced, and investors will require a share of equity, thus reducing shareholder profit. The pecking order arises from the assumption that managers will pursue financing that exhibits the least cost of capital (Shyam-Sunder and Myers, 1999). Firms will opt for retained earnings as it has no adverse selection issues from information asymmetry (Frank and Goyal, 2003). When retained earnings are limited, the firm should pursue debt and choose equity only as a last resort (Frank and Goyal, 2003, Shyam-Sunder and Myers, 1999).

In explaining how firm-specific factors affect capital structure decisions, the pecking order theory indicates that profitable firms have more retained earnings and thus pursue investment opportunities using internal financings (Kayo and Kimura, 2010). Conversely, Myers (1984) argues that a negative relationship between profitability and leverage exists because profitable firms have more retained earnings. Also, when a firm's retained earnings are limited, and debt is considered a source of financing, the pecking order asserts that asset tangibility impacts a firm's ability to pursue investment opportunities. The availability of tangible assets increases a

[14] Agency costs are costs that arise as a result of agency problems which ultimately contribute to the cost of capital (Frank and Goyal, 2003).

firm's propensity to carry out investment projects because it provides firms with the capacity to pursue external financing when internal financing is limited. A firm's degree of asset tangibility indicates a firm's debt capacity (Dietrich, 2007) because its fixed assets can serve as collateral to secure debt financing (Frank and Goyal, 2003). As a result, a firm with relatively high asset tangibility generally tends to have a lower cost of external financing (Lyandres and Palazoo, 2016). However, firms with a low degree of asset tangibility are more likely to face difficulties raising external capital and be financially constrained, thus, missing out on lucrative investment opportunities (Almeida and Campell, 2007).

Studies that follow the theoretical assertions of the agency theory and the pecking order theory (Lang et al., 1996; Aivazian et al., 2005; Frank and Goyal, 2003; Hu and Yang, 2016) accentuate the negative impact of leverage on investment. They examine how firm-level factors such as size, profitability, and asset tangibility affect a firm's corporate investments. This chapter examines the assertions of Aivazian et al. (2005), Lang et al. (1996), and Hu and Yang (2016) to determine the effect of leverage, profitability, firm size, and asset tangibility on the propensity to pursue international investment.

4.3 Empirical Literature and Hypothesis Development

4.3.1 Leverage and Investment

There is support for both overinvestment and underinvestment theories in the empirical literature. For example, Firth et al. (2008) examine the relationship between leverage and investment in Chinese firms, where state-owned banks primarily provide debt. They adopt a firm fixed effects model using the ratio of the firm's net capital expenditure to total assets as a measure of investment, the ratio of total bank loans to total assets as a proxy for leverage and the natural log of total assets as a measurement of firm size. They find a negative correlation between leverage and investment and evidence that the negative effect is due to the overinvestment problem. This negative correlation is weaker in low-growth firms and those with a high degree of state shareholding. The study indicates that the overinvestment problem stems from the scenario of Chinese state-owned banks being obliged to provide soft loans and bailout incentives to low-growth and poorly performing state-owned firms. Access to soft loans provides the firm's management with free cash flow to pursue investment projects at the manager's discretion. Based on agency theory, debt serves as a governance mechanism that can kerb overinvestment. However, Firth et al. (2008) indicate that debt does not serve a disciplinary or

monitoring role in China's case. Instead, it contributes to the overinvestment problem because of the relationship state-owned banks have with SOEs. Cull and Xu (2003) find that Chinese SOEs discriminate against private firms and have become increasingly inefficient in allocating credit since the mid-1990s. They are consistently obliged to bail out low-performing SOEs. Firth et al. (2008) also find evidence of underinvestment bias in Chinese privately owned firms.

Aivazian et al. (2005) examine the effect of financial leverage on a firm's investment decisions using data on publicly traded Canadian companies. The study adopts an ordinary least squares (OLS), random and fixed effects estimation technique to control for heterogeneity among individual firms and industry effects. It also adopts the ratio of net investment to fixed assets as a proxy for investment and the ratio of total liabilities to total assets as a measure of leverage. The results of the study indicate that leverage is negatively correlated to firm investment, and this effect is stronger for firms with low growth than high growth. Aivazian et al. (2005) suggest that this negative correlation aligns with the overinvestment theory. However, Aivazian et al. (2005) find evidence that leverage serves a disciplinary role in Canadian firms. Lang et al. (1996) analyse a sample of 640 US industrial firms from 1970 to 1989 using an OLS estimation method. Unlike Aviazian et al. and Firth et al., they do not account for firm-level heterogeneity. The results show a significant negative correlation between leverage and subsequent investment. Their results are consistent with the hypothesis that leverage serves as a mechanism to mitigate agency problems.

McConnell and Servas (1995) examine a sample of 860 non-financial firms for 1976, 1986 and 1995 using a pooled regression model. They find that corporate value is negatively correlated with leverage for firms with high-growth possibilities, and their results are consistent with the underinvestment hypothesis that firms will be deterred from pursuing lucrative investments due to the return on investment being accrued to debt holders rather than shareholders. The study also finds that leverage attenuates overinvestment and increases firm value.

Cai and Zhang (2010) adopt a time series regression model to study the effect of firm leverage on future research and development investment. The study uses Compustat firm-level data from 1975 to 2002 and measures firm leverage as the total liabilities to equity ratio. The result finds that a 10% increase in the leverage ratio is associated with a 6.23% decrease in the investment rate. The results show that firms with higher leverage have a higher risk of debt overhang. However, R&D investment may be less affected by leverage changes as firms investing in R&D typically have a lower risk of facing underinvestment problems (Cai and Zhang, 2010).

Using a sample of 8,674 diversified firms to study the effect of capital structure on investment, Ahn et al. (2006) adopt a cross-sectional analysis where investment is proxied by the ratio of current capital expenditure to sales, and leverage is measured as the ratio of debt to equity. They find that debt can serve a disciplinary role by limiting managerial discretion over free cash flow and pursuing less profitable investments. However, managers have considerable control over which investments are constrained when a firm is highly diversified and has different growth opportunities. Thus, although increased leverage might burden overall investment, corporate headquarters can assign the debt service in a manner that some subsidiaries or divisions bear a disproportionate share of the debt service burden.

Edson and Farai (2018) study the capital structure and investment nexus in African countries. Their study considered 1,074 non-financial firms listed on all African stock exchanges between 1996 and 2015. Using a GMM estimation method and measuring investment as net capital expenditures to net fixed asset ratio and leverage as the ratio of total assets to long-term debt, the study finds that leverage has a significant negative correlation to investment. The results indicate that African firms use leverage conservatively and that the negative effect is significant for both low- and high-growth firms, thus, providing evidence for both the underinvestment and overinvestment theories. They also observe that African firms invest more when there is an availability of cash flow and that internal funds have a significant effect on firm investment.

In a study of Indian pharmaceutical companies from 1998 to 2009, Franklin and Muthusamy (2011) estimate the effect of capital on investment decisions. The study adopts a pooling regression, random and fixed effects model to examine the effect of leverage, sales, cash flow, profitability, Tobin's Q, liquidity and retained earnings on investment. It divides its sample into three categories: small, medium and large firms. The results show a significant negative effect of leverage on medium-sized firms where variables such as retained earnings and firm size have a positive correlation with investment. The findings are consistent with the overinvestment and underinvestment theories.

Shukar and Shaw (2021) use firm-level data obtained from the CMIE Prowess database to study the effect of firm leverage on physical investment. The data comprised both listed and non-listed firms from 2004 to 2012, and the study adopts a fixed-effects regression model. Using the ratio of Debt-to-Assets as a proxy for firm leverage and the annual change in net fixed assets as a measure of investment rate, the study finds evidence that high leverage in Indian firms deters investment, attributing the findings to the underinvestment problem.

Similar to Firth et al. (2006), Yuan and Motohashi (2014) study the impact of leverage on investment in China and how state ownership influences the relationship. The research measures investment using fixed investment ratio (fixed investment/total assets) and leverage as the ratio of total liabilities to total liabilities. The study evinces that leverage has a significantly negative impact on central government-owned firms, local government-owned firms and non-state-owned firms. Specifically, this negative relationship is more apparent in low-growth local government-owned and non-state-owned firms, implying a disciplinary effect of leverage over investment. However, no such effect was found for central government-owned firms. They conclude that the effect of leverage varies according to the firm's major shareholder.

Studies that have explicitly examined the effect of capital on international investment include Egger and Kesina (2013), who focus on the effect of credit constraints on the propensity of Chinese firms to pursue export opportunities. The study adopts a binary logit model and measures leverage as the ratio of debt to capital. Also, it incorporates variables such as firm size, productivity, and total fixed asset. It finds that firms that are leveraged to a high degree in terms of a higher debt ratio are less likely to be exporters. Moreover, the likelihood decreases by approximately two percentage points when the debt ratio rises by one standard deviation. The study also finds that more profitable firms and those with a higher degree of liquidity have a higher propensity to export.

Hu and Yang (2015) examine the relationship between leverage and cross-border M&A. Using a sample of 8,500 cross-border M&As in 57 countries from 1990 to 2010. They find that firms with higher leverage are less likely to acquire foreign targets. In contrast, firms with lower leverage tend to be targets acquired by foreign firms. The study also indicates that after the acquisition, overleveraged buyers tend to finance themselves by selling equity. By contrast, under-leveraged acquirers may still have some capacity to borrow debt after the acquisition. They indicate that this finding is consistent with the pecking order theory. Firms will pursue debt financing when internal financing is limited. However, when internal funding is limited and the firms are overleveraged, they will seek equity financing as a last resort. The effect is more pronounced in Asia than in North American countries. In a more recent study, Alexandridis et al. (2020) employ a comprehensive sample of 524 firms over 6,695 firm-year observations and 535 acquisition deals in the shipping sector from 1990 to 2015. The study examines the effect of abnormal debt levels on the decision to pursue an acquisition. A binary regression model was adopted with a probit model where the dependent variable is binary and takes the value "1" if a

company undertakes at least one acquisition and 0 otherwise. The results find a negative correlation between abnormal leverage and the probability of a firm undertaking an acquisition.

Ferrando (2017) studies the importance of financial flexibility on international investment across the Euro Zone and the UK and supports the hypothesis that financial flexibility improves firms' ability to undertake future investment. The results show that firms with a conservative leverage policy invest more in the years following the conservative financial policy.

Thus, highly leveraged firms face stronger limitations and risks in raising finance, which can compromise their propensity to pursue international investment opportunities (Alexandridis et al., 2020; Egger and Kesina, 2013; Hu and Yang, 2015). Moreover, studies that show evidence of the underinvestment and overinvestment theories also show the negative effect of leverage on investment (Firth et al., 2008; Cull and Xu, 2003, Aivazian et al., 2005; Ahn et al., 2006) Franklin and Muthusamy, 2011; Yuan and Motohashi (2014). Thus I formulate the hypothesis:

H1- An increase (decrease) in leverage results in a low (higher) probability of internationalisation.

4.3.2 Firm Size and Investment

Many studies emphasise that firm size is a significant determinant of competitiveness (Ali and Camp, 1996; Krushev and Strebulaev, 2013). For example, according to Cohen and Klepper (1996), larger firms are better off than smaller firms because of their availability of resources in management, finance, research and development and marketing. Johanson and Vahlne (1977) suggest that internationalisation theories indicate that FDI requires a firm to fulfil basic requirements of resource availability and firm-specific advantages. Coviello and Martin (1999) suggest that smaller firms differ from larger firms in their managerial styles, independence, ownership and scale of operation. Man et al. (2002) assert that organisational structure and response to competition and the external environment differ based on firm size.

Frequently measured as the number of employees, total assets or sales (Alexandridis et al., 2020; Cai and Zhang, 2010; Aivazian et al., 2005; Cull and Xu, 2003; Firth et al., 2008), numerous studies show that firm size affects investment. Kadapakkam et al. (1998) examine the influence of firm size and cashflow availability on investment in six OECD countries. The study adopts a panel regression model and finds that firm size positively affects international investment. Larger firms face a lower cost of financing when pursuing international investment

than smaller firms because they have more retained earnings. They also have greater flexibility in timing their investments and may defer investment projects until internal funds are available. These same firms also have a diverse portfolio of goods and services and are more flexible than smaller firms in adjusting to transitory shocks and cyclical profit variation (Kadapakkam et al. 1998). However, agency problems may be more pronounced in larger firms because of dispersed equity ownership, and managers of large firms face less market discipline. They may tend to increase in size whenever internal funds are available, thus resulting in overinvestment.

According to Caves (1974), the relationship between firm size and investment with all other factors held constant has been established statistically. Blomstrom and Lipsey (1991) state that MNEs are distinguished from other firms by factors such as their large size, high profitability, large market capitalisation and increased expenditure on R&D and advertising. Calof (1994) studied firm size's direct and indirect effects on internationalisation using an ANOVA analysis on 14,074 Canadian countries. The study finds a significant positive correlation between firm size and the propensity to export. It suggests that small firms do not internationalise as much as large firms due to resource constraints. Lau (1992) examined the internationalisation process of 165 garment manufacturers in Hong Kong and found that the internationalisation process of smaller export-oriented firms differs from larger MNEs as smaller firms possess limited resources and firm-specific advantages compared to larger firms. Cole (2013) examines the capital structure of privately held US firms using data from four nationally representative surveys conducted from 1987 to 2003. The study finds that larger firms tend to have greater availability of resources, be more diversified, and have a lower probability of bankruptcy.

Firm size indirectly affects a firm's ability to pursue investment opportunities, as larger firms are more productive because of the increasing returns at scale. For example, Baldwin (2002) compares using value-added per employee in the manufacturing industry in Canada and the United States. The findings indicate that value-added in plants with more than 500 employees is 147% of the industry average. In comparison, the value-added per employee in plants with fewer than 100 employees is 67% of the industry average. Lee and Tang (2001) find that Canadian firms with more than 500 employees and firms with between 100 and 500 employees are 17% and 15% more productive than firms with fewer than 100 employees.

Based on the existing literature, firm size has a positive effect on investment. Studies focusing on the leverage and investment nexus control for firm size in their model (Alexandridis et al.,

2020; Cai and Zhang, 2010; Aivazian et al., 2005; Cull and Xu, 2003; Firth et al., 2008) and we account for firm size in this chapter's empirical model and propose the following hypothesis:

H2- An increase (decrease) in firm size results in a higher (lower) probability of internationalisation.

4.3.3 Profitability and Investment

According to a myriad of research, profitability is a measure of financial performance (Du and Boateng, 2015; Lopez-Cabarcos et al., 2015; Kamasak, 2017). Du and Boateng (2015) study the effects of state ownership and institutional influences on value creation through cross-border M&A from 1998 to 2011 for 468 firms and found that high-performing and profitable firms are more likely to invest abroad. They further indicate that profitable firms have better access to financial resources. Peng and Deliso (2006) contend that internationalisation aspirations can only be established if the required resources, such as financial capability and human capital, are available. Jung and Basal (2009) studied 701 Japanese firms from 1993 to 1998 and concluded that firm performance is critical in determining its ability to pursue investment because it affects its propensity for risk-taking. They find that profitability proxied by return on assets has a significant positive effect on internationalisation. The effect of profitability on internationalisation in emerging economies has seldom been discussed in the existing literature, but the effect of investment decisions on profitability has been extensively examined in a myriad of studies.

According to the pecking order theory, profitable firms are more likely to use retained earnings (Kayo and Mimura, 2010). Hence, proponents of the theory argue that profitable companies will prioritise internal funding to secure their independence and avoid the costs associated with external financing. Chen et al. (2014) indicate that when pursuing international investment opportunities, profitable firms from emerging economies will prefer to use internal funding first before considering external funding because it is less risky and cheaper. Chen (2004) examines the capital structure decisions of 88 Chinese-listed companies from 1995 to 2000 using a pooled OLS, fixed effects and the random-effects model and finds that the firms in the sample follow the pecking order, as profitable firms use internal financing first because the bankruptcy laws in China are less efficient than those in developed economies. However, Lim et al. (2015) examine the real estate industry in China, which is dominated by SOEs and find that the companies in this industry prefer external to internal funding.

Helwege and Liang (1996) test the pecking order theory by examining the capital structure decision of US firms that went public in 1983. The study estimates IPO firm security offerings from 1984 to 1992 using logit and multinominal logit model. The results show that firms with access to adequate capital and bond markets do not follow the pecking order when choosing sources of finance even though the firm has excess cash reserves. In contrast, Albulescu et al. (2018) examine 106 Central and Eastern European firms in the wine industry to ascertain the effect of profitability on the investment. The study adopts a panel regression model and finds that profitability has a positive effect on investment. Profitable firms have access to internal financing and the capacity to pursue external financing options. A firm's profitability provides it with the financial capability to pursue investment opportunities. Bhama et al. (2017) use a dataset of 405 Indian and 312 Chinese firms from 12 industries and find that most adhere perfectly to the pecking order theory. Reddy and Babu (2008) argue that India's pharmaceutical industry is highly profitable and that firms in this industry tend to pursue investment opportunities using retained earnings. Thirumalaisamy (2013) adopted a sample size of 169 profitable Indian companies in 7 industries from 1996 to 2010 to study the relationship between firm growth and retained earning behaviour. The study investigates this by using an OLS estimation and finds that more profitable firms utilise retained earnings to pursue investment instead of paying out dividends to shareholders. Reddy and Babu (2008) argue that India's pharmaceutical industry is highly profitable and that firms within this specific industry tend to pursue investment opportunities using retained earnings.

Yang and Ma (2011) indicate that the Chinese electronic industry prefers debt for growth and expansion ventures. However, Thomas (2013) observes that profitable firms prefer internally generated funds in the Indian construction industry. It is evident that the literature evinces mixed results based on firm, industry, and country-specific factors. Accounting for these differences is crucial in effectively understanding the capital structure and international investment nexus. Based on the pecking order theory, this chapter proposes that profitability positively impacts internationalisation and argues that profitability is associated with increased access to internal financing. As such, the following hypothesis is proposed:

H3 - An increase (decrease) in profitability results in a higher (lower) probability of internationalisation.

4.3.4 Asset Tangibility and Investment

The firm's management enforces strategic capital structure decisions prior to pursuing international investment because of the high-risk exposure and cost associated with it (Chaung, 2014). Numerous studies accentuate the significance of firm asset tangibility towards enhancing the financial capacity to pursue international investment (Almeida and Campello, 2007; Giambona and Schwienbacher, 2008). Specifically, firms with a high degree of tangible assets have the capacity to pursue external financing when internal financing options are limited (Chakraborty, 2010). Almeida and Campbell (2007) test the effect of asset tangibility and financial constraints on investment. The study uses a sample of manufacturing firms from Compustat from 1985 to 2000 and finds that tangible asset serves as collateral that supports a firm's access to debt financing, which increases a firm's capacity to pursue investment opportunities. In line with this, Liberti and Sturgess (2018) also indicate that tangible assets are pledged as collateral in corporate borrowing and play a crucial role in a firm's access to external financing.

A firm's asset tangibility level is regarded as an indicator of a firm's debt capacity (Dietrich, 2007). As a result, a firm with relatively high asset tangibility generally has a lower cost of external financing (Lyandres and Palazoo, 2016). However, firms with a low degree of asset tangibility are more likely to face difficulties in raising external capital and be financially constrained, thus missing out on lucrative investment opportunities (Almeida and Campell, 2007). Giambona and Schwienbacher (2008) and Campello and Giambona (2013) argue that asset tangibility is in line with the pecking order theory as firms with access to tangible assets can access less costly debt financing without constraining the firm to pursue the more expensive equity financing option. Lu-Andrew and Yu-Thompson (2015) study the effect of tangible assets on firm performance and found that firms with a high degree of liquid and tangible assets with high collateral value can use trade credit when exporting, which is cheaper than bank loans. Iltas and Demirgunes (2020) indicate that the benefit of easy liquidation of these tangible assets opens the firm to the option of using a cheaper form of debt financing in the form of trade credit. The following hypothesis is thus proposed:

H4 - An increase (decrease) in tangible assets results in a higher (lower) probability of internationalisation.

4.4 Methodology

4.4.1 Data

This Chapter relies on data from the Orbis database from the Bureau van Dijk (BVD). The data in Orbis is sourced from over 160 governments and commercial providers organised in a standard format to enable comparison, and the database balance sheet and income statement information is obtained from business records governed by country-specific legal and administrative filing requirements.

Data from ORBIS is adopted for several reasons:

- It is the largest cross-country firm-level database encompassing public and private firm financial statements and production activity (Kalemli-Ozcan et al., 2018). It covers more than 300 million companies in over 200 countries and territories, making it one of the most comprehensive sources of international business data available.

- Depth of Information: Orbis provides detailed financial and operating metrics, as well as ownership structures, industry classifications, and executive and board member information.

- User-friendly interface: Orbis is designed with a user-friendly interface that allows users to easily search for, filter, and analyse data, making it accessible to both novice and experienced researchers,

- Cost: ORBIS tend to be more cost-effective for academic research compared to other firm-level databases like Thomson Reuters. Besides, the latter is more common and has been extensively used in the existing empirical research, particularly for macro-level studies.

Additionally, the ORBIS database is unique as it comprises of firm-level cross-border M&A ownership dataset of both developed and emerging economies.

Our dataset comprises both listed and unlisted companies and contains data on about 200,000 firms in China from 2009 to 2017. The data is unconsolidated from firms whose parent companies are in China. Therefore, this dataset includes the subsidiaries' of Chinese firms that can be located anywhere in the world and the degree of shareholder ownership of the parent companies for each. Such a dataset will be used to explore the determinants of Chinese firms acquiring firms in other countries. To construct the panel dataset, the cross-section dimension (*i)* was established by grouping the parent company and the foreign subsidiaries acquired over

the observable period (*t)*. To the best of my knowledge, no study has used this dataset to investigate this topic from an emerging economies perspective.

The original data set contains 9 million firm-year observations. I only keep firms in the sample required to calculate leverage and explore the proposed hypothesis for the sample period 2009 to 2017. I pursue the standard cleaning procedure to account for data irregularities as proposed by Kalemli-Ozcan et al. (2012; 2015) and Gebauer et al. (2017). To ensure consistency and control for extreme values, I incorporate firm selection criteria for treating issues of missing data, extreme values, and data inconsistency when using Orbis data from Kalemi-Ozcan et al. (2012; 2015) and Borensztein and Ye (2018). These criteria include:

- Drop firm-year observations with negative values of all types of assets, employment, sales, operating revenue, equity, and liabilities (current liabilities, other current liabilities, non-current liabilities, other non-current liabilities).
- Drop firms with less than two employees to exclude firms that are not operational.
- Drop firms if any total assets, current, and non-current liabilities are missing in all years.
- Drop firm-year observations beyond the 0.1% and 99.9% tails of leverage and liquidity measures.
- Drop firm-year observations beyond the 0.1% and 99.9% tails of total assets, number of employees, sales, total fixed assets, tangible fixed assets, and earnings before tax (EBIT).
- Drop firm-year observation beyond the 0.1% and 99.9% tails for the profitability measure.
- Drop firm-year observation beyond the 0.1 and 99.9% tails for the tangibility measure.

4.4.2 Dependent Variable

The effect of leverage on investment has been empirically explored in the literature. Notable studies such as Firth et al. (2008) explore this link by adopting net capital to total asset ratio as a measure of investment. This measure is also adopted by McConnell and Servas (1995), Aivazian et al. (2005), Lang et al. (2006), and studies such as Yuan and Motohashi (2014) measure investment using fixed investment ratio (fixed investment/total assets). This study seeks to explore the likelihood of a firm pursuing international investment through M&A. To estimate this, we adopt a binary regression model, which includes a binary dependent variable. This method is used in studies that explore the effect of capital structure on international

investment, such as Egger and Kesina (2013), Hu and Yang (2015) and Alexandridis et al. (2020), who adopt a probit regression model.

The dependent variable is defined as:

$$\Pr\,(MNE)_{it}\begin{cases} 0 \;\; If\; No\; Internationalisation \\ 1\; If\; Internationslaisation \end{cases} = \beta_0 + \beta_{it}X_{it} \qquad (4.1)$$

To capture a firm pursuing international investment, I account for time t-1 in which the firm was '0', i.e., the parent company did not pursue international investment at time t-1, and the parent company does not acquire a foreign subsidiary. I specify '1', i.e., internationalisation, to indicate that the parent company pursued international investment at time (t) and thus acquired a foreign subsidiary.

To avoid double-counting, the data is modified to account for one international acquisition of a particular subsidiary by the parent company and excludes the subsequent acquisition of the same subsidiary. However, Chinese parent firms that acquire multiple firms in the same year are not excluded, and firms that have internationalised are those that have acquired more than 10% of the foreign subsidiary.

4.4.3 Independent Variables

Having identified the core samples employed and the definition of the binary dependent variable, we now focus on the definition and construction of the core explanatory variables of the study. The set of explanatory variables was identified in the literature review section, and these are (i) Leverage, (ii) firm size, (iii) profitability and (iv) tangibility. I will discuss the measurement of each of these variables next.

4.4.3.1 Leverage

Financial leverage shows the relationship between debt and equity or asset in the firm's overall value (Vo and Ellis, 2017). The measurement of financial leverage is complex, possibly due to its link to asset valuation (Borio, 1990, p. 52). There seems to be no consensus on the best measure of financial leverage, although some measures are more commonly used than others. The issue is whether leverage should be determined from the standpoint of the financial market (i.e., book-to-market leverage) or the perspective of the firm's internal accounting records and

financial statements (i.e., book-to-book leverage). Numerous studies usually differentiate between the book and market value of leverage (Frank and Goyal, 2009), although the distinction is not based on the value of the debt itself (the numerator) but how the value of the firm (the denominator) is specified (Bowman, 1980).

Book leverage is defined as the book value of debt scaled by the accounting (book) value of the firm (e.g., assets, capital, or equity). In contrast, market leverage is the book value of debt divided by the firm's market value (Bowman, 1980). This thesis chapter follows extant capital literature and investment literature (e.g., Aivazian et al., 2005; Frank and Goyal, 2009; Edson et al., 2018) by adopting book leverage as the principal leverage measure. This decision is based on the data source and the data availability in the sample period. Also, the decision is centred on the strength of the book leverage and the limitations associated with the market leverage. Myers (1977) accentuates the strength of using book (accounting) leverage by indicating that managers focus on book leverage because debt is better supported by assets in place than by its growth opportunities.

Frank and Goyal (2009) also indicate that book leverage is preferred because financial markets fluctuate consistently, and market leverage numbers are unreliable as a guide to cooperate financial strategy. Graham and Harvey (2001) indicate that many managers do not rebalance capital structure in response to equity market movement, therefore emphasising the book leverage adequately reflects capital structure decisions. Also, market values (used to calculate market leverage) are challenging to measure, especially for private firms that are not publicly listed; hence, market prices are unobservable. It is also important to note that a potential limitation of book leverage is the possibility of extreme values. In order to mitigate this, the leverage ratios have been winzorized as explained in section 4.4.1

Several definitions of book leverage ratio are offered in the literature, and no consensus has been reached regarding which is the most suitable. This study follows Aivazian et al. (2005), Firth et al. (2008) and Edson and Fari (2018) and defines leverage as the ratio of debt-to-asset. In order to achieve robust results, I use Debt to Capital (Leverage Ratio) similar to studies such as Lang et al. (1996) and Mittoo and Zhang (2008) as another measure of leverage (see equation 4.3). Additionally, I employ other measures of leverage, namely long-term debt to asset and short-term debt to asset, to determine consistency in the results (see section 4.6 for robustness checks)

$$\textbf{Leverage (Debt to Asset Ratio)} = \frac{\textbf{Total Debt}}{\textbf{Total Asset}} \quad (4.2)$$

$$\textbf{Leverage (Debt to Capital Ratio)} = \frac{\textbf{Total Debt}}{\textbf{Total Capital (Total Debt+Equity)}} \quad (4.3)$$

4.4.3.2 Firm Size

Many studies on capital structure and investment incorporate firm size as either a controlling or an explanatory variable to better understand the link between the two and use a variety of proxies to measure firm size. Following Fama and French (2002) and Frank and Goyal (2003), I adopt the natural log of the number of employees to measure firm size.

4.4.3.3 Profitability

In order to measure profitability, studies such as Johnsen and McMahon (2005) use net profits divided by total assets and studies such as Zou and Xiao (2006) and Adir et al. (2015) employed operating income by total assets. However, the commonly used in extant capital structure literature, such as Chen (2014), Bhama et al. (2017), and Albulescu et al. (2018), use earnings before interest and tax divided by total assets as a measure for return on assets which served to quantify the firm profitability. Therefore, I adopt the proxy used by Bhama et al. (2017) and Albulescu et al. (2018).

4.4.3.4 Tangibility

Tangibility, regarded as the asset structure and degree of capital intensity, has been measured extensively using the calculation of fixed assets divided by total assets (Almeida and Campello, 2007; Lu-Andrew and Yu-Thompson, 2015). As such, I use the ratio of fixed assets to total assets as a measure of asset tangibility.

Table 4.1 Summary of Dependent and Independent Variables

Internationalisation (MNE)	Probability of a firm pursing international investment = 1 or not =0.
Leverage (Debt to Asset)	This derived as debt divided by total assets. Where Debt (USD millions) is measured as (current liabilities + other current liabilities) + (non-current liabilities + other non-current

	liabilities), and Asset is given as total assets held by the parent firm (USD million) in the dataset.
Firm Size	This is measured as the number of employees. We employ the natural log of firms in all the empirical analyses in this chapter.
Prof (Profitability)	This is measured by net profit (USD million) divided by total assets (USD million).
Tan (Tangibility)	This is measured as the total fixed assets (USD million) divided by the total assets.

Note – Dependent variable highlighted. All data used to construct the variables for the analysis is obtained from the Orbis database. Debt is measured as (current liabilities + other current liabilities) + (non-current liabilities + other non-current liabilities). Asset is measured by the total asset the parent firm holds (USD millions). Profitability is derived as net profits divided by total assets. Debt to Asset is obtained by dividing debt by Asset. Tang (Tangibility) is measured as the ratio of fixed assets to total assets. The leverage variables are rations. This is also the same for Profit (profitability) and Tang (tangibility), while the firm size, measured as the number of employees, is scaled in a natural log form.

The variables Debt to Capital, Short-term leverage and Long-term leverage that will be used in the robustness checks are calculated as follows:

- Leverage (Debt to Capital) is measured as Debt divided by Capital (USD millions).
- Short-Term Leverage (Short-term debt) is derived as Debt (current liabilities + other current liabilities) divided by Asset.
- Long-term Leverage (Long-term debt to Asset) is measured as Debt (non-current liabilities + other non-current liabilities) divided by Asset.

4.4.4 Empirical Model

To examine the effect of leverage on the probability of firms pursuing international investment, I adopt a panel regression model. The empirical analysis uses data consisting of a cross-sectional element (i) and a time series element (t). The dataset used is an unbalanced panel data that has country, firm-specific and time variations. Panel data analysis enables researchers to account for unobservable factors and a greater ability to account for complex patterns in a model than a

purely cross-sectional or time-series data analysis (Hsiao, 2007). Panel data estimations also control the effects of omitted variables and have more degrees of freedom and sampling variability than cross-sectional and time-series estimations.

The effect of leverage on international investment has been widely explored in the literature. Many studies have explored the probability of a firm pursuing international investment, given its capital structure. More specifically, numerous studies have explored the probability of a firm pursuing international investment, given its capital structure. Studies such as Egger and Kesina (2013) explored this link by examining the impact of credit constraints on Chinese firm-level data compiled by the National Bureau of Statistics of China from 2001 to 2015. Other studies like Hu and Yang (2015) adopt the probit model on a panel of 57 countries comprised of Asian and North American countries obtained from SDC to explore the impact of leverage on investment in the shipping industry. While Alexandris et al. (2020), similar to Hu and Yang (2016), employ a probit model of North American firms to explore the link between financial policy on the probability of a firm pursuing international investment. In contrast to the studies above, to our knowledge and scope of this research, this chapter is the first to deviate from the common estimation of the probit and logit models. Instead, it employs a linear probability model (LPM) with high dimensional fixed effects. LPM is the most suited because it has the capacity to account for several fixed effects that will be included in the estimation.

Similar to the Logit and Probit Models, the LPM is used when the regression model has a dichotomous dependent variable. However, ordinary least squares (OLS) are used to estimate the parameters of LPM, which uses a linear function of the independent variables. This indicates that the LPM is linear, and questions arise on its ability to bind the estimated probabilities between [0,1] for meaningful estimates. Although this might be the case, LPM is commonly used due to its straightforward computation and interpretation (Luca et al., 2015). Studies such as Lang et al. (2006) utilise OLS estimation to examine the link between leverage and investment. Although, Aviazian et al. (2005) and Firth et al. (2008) criticise this and indicate that Lang et al. (2006) fail to account for the very evident firm heterogeneity in the data sample. Therefore, to account for this, I incorporate high dimensional fixed effects in the linear probability model.

The proposed linear probability models are as follows:

$$\Pr(\mathrm{MNE})_{\mathrm{ijt}} = \left\{ \begin{matrix} 0 \text{ If No Internationsalisation} \\ 1 \text{ If Internationslaisation} \end{matrix} \right\}) = \beta_1 Leverage\ (Debt\ to\ Asset)_{ijt} + \beta_2 Firm\ Size_{ijt} + \beta_3 Profitability_{ijt} + \beta_4 Tangibility_{ijt} + \mu_i + v_j + \delta_t + \varphi_{jt} + \varepsilon_{ijt} \quad (4.4)$$

$$\Pr(\mathrm{MNE})_{\mathrm{ijt}} = \left\{ \begin{matrix} 0 \text{ If No Internationsalisation} \\ 1 \text{ If Internationslaisation} \end{matrix} \right\}) = \beta_1 Leverage\ (Debt\ to\ Capital)_{ijt} + \beta_2 Firm\ Size_{ijt} + \beta_3 Profitability_{ijt} + \beta_4 Tangibility_{ijt} + \mu_i + v_j + \delta_t + \varphi_{jt} + \varepsilon_{ijt} \quad (4.5)$$

Where $(\mathrm{MNE}_{\mathrm{ijt}})$ denotes the probability of firm (*i*) pursuing international investment, (*i*) is a parent-foreign subsidiary firm pairing and represents the firm panel dimension of the estimations, (*j*) represents the parent country which, in this case, is China and the foreign subsidiary's country, and (*t*) is the time dimension of the estimations, 2009– 2017. $\mu_i, \boldsymbol{v_j}, \boldsymbol{\delta_t}, \boldsymbol{\varphi_{jt}}, \boldsymbol{\varepsilon_{ijt}}$ represent the high dimensional fixed effect. Standard errors are clustered at an industry level to account for correlation among firms in the same industry and allow for different firm variations between industries.

A significant advantage of adopting the LPM instead of the commonly used logit and probit model is that the LPM allows for this incorporation of high dimensional fixed effects. The availability of a large micro-level dataset has spurred interest in methods for estimating models with high dimensional fixed effects. Studies in economics and political science, amongst others, find the introduction of fixed effects to be a way of controlling for unobserved heterogeneity that is shared among the group in the observations. In this case, it becomes possible to account for all intergroup variability by adding some dummy variables that absorb group-specific heterogeneity to the set of regressors. These fixed effects will control for unobserved heterogeneity that exists in the firms, countries and periods. This approach also has the advantage of allowing for the existence of general patterns of correlation between the unobserved effects and the independent variables.

When fitting a model with fixed effect, adding the group dummy to the set of regressors is not required, particularly when dealing with high dimensional fixed effects where the number of groups is large (Guimaraes and Portugal, 2012). An example of the need to use high dimensional fixed effects is when dealing with a large employer-employee panel dataset because, when examining relationships in the labour market, studies often want to control for two cases of unobserved heterogeneity concurrently, e.g. the company and the worker. Other examples in which high dimensional fixed effects would be useful are in panel datasets on student performance, with likely sources of heterogeneity being the students, the teachers and the school (Carnerio, Guimaraes and Portugal, 2012) and datasets on exporters and importers (Head and Mayer, 2014). Adopting high dimensional fixed effects in the LPM is particularly advantageous because of our large dataset of 252,513 firm-year observations. It also accounts for any unobservable heterogeneity that can be found in the parent firms, the foreign

subsidiaries, the country and time periods. For linear regressions like the LPM, the fixed effects can be accounted for without introducing group dummy variables in the model (Guimaraes and Portugal, 2012).

High Dimensional Fixed Effects

- Firm Fixed Effects *(i)* - These fixed effects will account for the potential heterogeneity that exists within the firms. Also, it is important that these fixed effects are assumed to be time-invariant. They capture the distinctive firm characteristics which impact the variation in strategies and performance outcomes across industries and firms (Mauri and Micheals, 1998). These unique resources and idiosyncratic processes drive heterogeneity among firms. They can provide a competitive advantage when protected from imitation and effective isolating mechanisms (Lippmand and Rumels, 1982). In the data sample, I control for unobservable factors in both the parent firm and the foreign subsidiary, such as the manager's skill & capability management style, business culture, and corporate policies. It is essential to control for this because if these factors are correlated with the core variables, then without proper treatment, omitted variable bias affects the estimated parameters and precludes causal inferences (Gormley and Matsa, 2014).

- County Fixed Effects *(j)* – These fixed effects are incorporated into the model to capture systematic, institutional and cultural differences that do not change over time. Through this, we control for unobservable factors such as bankruptcy laws, shareholder and creditor rights, the political environment in China's state-capitalist and the financial and banking environment. Additionally, this controls the various countries of the subsidiaries.

- Time Fixed Effects *(t)* -These fixed effects account for factors that change over time but not across the entities. For example, these unobservable factors include national policies, federal regulations and international agreements that occur during the sample time period. Thus, these effects are assumed to be common across parent firms.

- The interaction of time and country fixed effects (i.e. country-year fixed effects) – This fixed effect is incorporated into the model to control for time-varying country-specific effects. Fundamentally, I account for time shocks that affect each country in a specific way. This will ensure that we account for unobservable factors such as legal, state and federal reforms that occurred within the sample period 2009– 2017 in China.

Essentially, by incorporating these fixed effects, I remove the effect of the characteristics to effectively assess the impact of leverage on the probability of Chinese firms pursuing international investment opportunities. As such, the LPM is used because, unlike the logit or probit model, it can accommodate these fixed effects in the models and allows for the clustering of standard errors at an industry level. Clustering at the industry level allows the errors among panel groups to be correlated. In addition, I allow shocks to one parent-foreign subsidiary pairing to be able to influence all other shocks of parent-foreign subsidiary pairing within the same industry.

To the best of our knowledge, no earlier empirical research has adopted an LPM to examine the effect of leverage on the probability of Chinese firms pursuing international investment via mergers and acquisitions. Therefore, I aim to ensure that the results of the linear probability model adopted are robust

4.5 Results and Discussion

This section presents the results of the empirical analysis in three parts. Firstly, it introduces the descriptive statistics, the results of the pairwise correlations matrix, and finally, the empirical model results.

4.5.1 Descriptive analysis

Table 4.2 Descriptive Statistics

Variable	Observations	Mean	Standard. Dev	Min	Max
Leverage (Debt to Asset)	270037	0.830	0.647	0.019	21.687
Leverage (Debt to Capital)	270037	12.524	26.789	0.027	174.481
Short-Term leverage (Short Term Debt to	270037	0.769	0.630	0.012	21.333

Asset					
Long-Term leverage (Long Term Debt to Asset	270037	0.058	0.135	0.00	0.018
Firm Size	270037	4.840	1.672	1.609	9.440
Profit	270037	0.1305	3.703	-8.154	1911
Tang	270037	0. .355	0.283	0.004	22.333

Note – All data used to construct the variables for the analysis is obtained from the Orbis database. Debt is measured as (current liabilities + other current liabilities) + (non-current liabilities + other non-current liabilities). Asset is measured by the total asset the parent firm holds (USD millions). Profitability is derived as net profits divided by total assets. Debt to Asset is obtained by dividing debt by Asset. Tang (Tangibility) is measured as the ratio of fixed assets to total assets. Short-Term Leverage (Short-term debt) is derived as Debt (current liabilities + other current liabilities) divided by Asset. Long-term Leverage (Long-term debt to Asset) is measured as Debt (non-current liabilities + other non-current liabilities) divided by Asset. (Debt to Capital) is measured as Debt divided by Capital (USD million). The leverage variables are rations. This is also the same for Profit (profitability) and Tang (tangibility), while the firm size, measured as the number of employees, is scaled in a natural log form.

Table 4.2 presents the descriptive statistics of the core explanatory variables incorporated in the empirical analysis after adopting the data selection criteria discussed in 4.4.1 and accounting for missing data in the sample. The final sample used in the empirical analysis stands at 270,037 firm-year observations. Based on the summary statistics, the two leverage ratios, Debt to Asset and Debt to Capital, have a standard deviation of 0.64 and 23.89, respectively. These values indicate that the measure Debt to Asset has a considerably lower variability than Debt to Capital. Overall, these statistics imply that inferences based on the leverage ratio could be made more confidently when Debt to Asset is used than when Debt to Capital is employed. Lower variance translates into lower standard errors, and lower standard errors are more efficient for valid inferences in econometric analysis (Wooldridge, 2009).

Consequently, analysis based on Debt to Asset may result in sharper inferences than the Debt to Capital leverage ratio. Furthermore, the minimum (maximum) value of Debt to Asset is 0.019 (21.687), and the Debt to Capital is 0.027 (174.481). Based on the minimum value of the Debt to Asset leverage ratio, the least leveraged firm in the sample uses 1.9% of debt in its capital structure. Equally, the maximum Debt to Asset leverage statistic indicates that the highest leveraged firm in the sample is highly leveraged at 2168%.

Table 4.3 illustrates the correlation matrix of the variables. According to the correlation coefficient, firm size and tangibility are negative and weakly correlated to leverage (Debt to

Asset). Also, profitability is positive but weakly correlated to the leverage (Debt to Asset) ratio. Regarding the debt-to-capital leverage ratio, firm size, profitability, and tangibility are weakly correlated to the leverage ratio. In summary, the results from the Pearson correction matrix indicate a very low correlation among the core explanatory variables. The highest correlation value is 0.306, which is reported for the correlation between firm size and tangibility. I find the low correlation among the regressor suitable because it implies that multicollinearity is not likely to pose a problem to the empirical findings.

Table 4. 3 Correlation Coefficient Matrix

Variables	Leverage Ratio (Debt to Asset	Leverage Ratio (debt to Capital)	Short-Term leverage (Sort Term Debt to Asset)	Long-Term leverage (Long -Term Debt to Asset)	Firm Size	Profit	Tang
Leverage Ratio (Debt to Asset	1.000						
Leverage Ratio (debt to Capital)	0.236*	0.206					
Short-Term leverage (Sort Term Debt to Asset	0.957	0.206	1.000				
Long-Term leverage (Long -Term Debt to Asset)	0.062	0.134	-0.174	1.000			
Firm Size	-0.102*	0.137*	-0.155	0.247	1.000		

Profit	-0.080*	-0.003	0.078	0.015	0.006*	1.000	
Tang	-0.114*	-0.026	-0.186	0.037	0.308*	0.010*	1.000

Notes: This table shows the correlation matrix for the explanatory variables contained in the empirical model. Significant at 5% confidence level. All data used to construct the variables for the analysis is obtained from the Orbis database. Debt is measured as (current liabilities + other current liabilities) + (non-current liabilities + other non-current liabilities). Asset is measured by the total asset the parent firm holds (USD millions). Profitability is derived as net profits divided by total assets. Debt to Asset is obtained by dividing debt by Asset. Tang (Tangibility) is measured as the ratio of fixed assets to total assets. The leverage variables are rations. This is also the same for Profit (profitability) and Tang (tangibility), while the firm size, measured as the number of employees, is scaled in a natural log form.

4.5.2 Empirical Model Results

Given that OLS has also been used in existing studies examining the impact of leverage on investment (Lang et al., 1996; McConnell and Servas, 1995), I will start by providing some results employing the OLS technique, which will serve as a benchmark/ baseline model. The result of the OLS estimation can be found in Table 4.4. The OLS estimation results indicate that the effect of leverage (Asset to Debt) on MNE is negative and statistically significant. Specifically, a 1 unit increase in leverage will result in a 0.106% reduction in Chinese firms' probability of pursuing international investment. The OLS estimation findings also show that a 1-unit increase in tangibility will result in a 1.74 % increase in the likelihood of internationalisation. Finally, the result also indicates that a 100% increase in firm size will result in a 3.53% increase in firms' likelihood of pursuing international investment.

Table 4.4 OLS Estimation, 2009 – 2017

	(OLS)
VARIABLES	**Pr(MNE)**
Leverage (Debt to Assets)	-0.00106**
	(0.000526)
Profitability	0.000072
	(9.01e-05)
Tangibility	0.0174***
	(0.00124)
Log Firm Size	0.0353***

	(0.000209)
Constant	-0.141***
	(0.00116)
Firm Fixed Effects	No
Time Fixed Effects	No
Parent Country Fixed Effect	No
Parent Country-Time Fixed	No
Observations	270,037
Prob>chi2	0.0000
R-squared	0.110

The dependent is Pr(MNE) highlighted. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All data used to construct the variables for the analysis is obtained from the Orbis database. Debt is measured as (current liabilities + other current liabilities) + (non-current liabilities + other non-current liabilities). Asset is measured by the total asset the parent firm holds (USD millions). Profitability is derived as net profits divided by total assets. Debt to Asset is obtained by dividing debt by Asset. Tang (Tangibility) is measured as the ratio of fixed assets to total assets. The leverage variables are rations. This is also the same for Profit (profitability) and Tang (tangibility), while the firm size, measured as the number of employees, is scaled in a natural log form.

Based on the results of the OLS estimation, I do not reject hypotheses 1,2 and 4; that is, an increase in leverage will result in a decrease in internationalisation Pr(MNE) and increases in size and tangible assets will increase internationalisation Pr(MNE). At the same time, I reject hypothesis 3; that is, in contrast to the hypothesis that profitability should increase internationalisation, the result shows the effect of profitability on the MNE variable is negative and statistically insignificant. Aivazian et al. (2005) indicates that the use of a pooled OLS estimation, as proposed by Lang et al. (1996) and Mcconnell and Servas (1995), is insufficient because it ignores possible fixed effects. Therefore, in what follows, I account for individual firm characteristics by accounting for fixed effects.

Table 4.5 shows the estimation results of the various fixed effects estimations conducted. We begin with model 1, which accounts for only firm fixed effects. According to this estimation's findings, the effect of leverage (Debt to Assets) on the probability that a firm becomes an MNE is negative and statistically significant at a 5% significance level. Specifically, the result also indicates that a 1 unit increase in leverage (Debt to Asset) will result in a 0.251% reduction in the probability of internationalisation. I also find positive and statistically significant results at 1% for tangibility and firm size. In particular, the findings show that a 1 unit increase in tangibility and firm size will lead to a 6.38% rise in the dependent variable. Also, a 100% increase in firm size

will lead to a 3.42% increase in the propensity of firms to pursue international investment. Finally, the findings of model 1 indicate that a 1 unit increase in profitability will result in a 0.004% increase in the MNE. However, I also find that this result is not statistically significant. Also, I find the result of model 1 to be consistent with hypotheses 1, 2 and 4.

Table 4. 5 Linear Probability Regression Results

	(1) Fixed Effects	(2) High-Dimensional Fixed Effects	(3) Fixed Effects	(4) High-Dimensional Fixed Effects
Variables	**Pr(MNE)**	**Pr(MNE)**	**Pr(MNE)**	**Pr(MNE)**
Leverage (Debt to Assets)	-0.00251**	-0.00332**		
	(0.00107)	(0.00135)		
Leverage (Debt to Capital)			-0.000066**	-0.000223***
			(3.14e-05)	(6.98e-05)
Profit	0.000044	0.000064***	0.000013	0.0000253***
	(9.84e-05)	(1.90e-05)	(9.75e-05)	(7.08e-06)
Tang	0.0638***	0.0529***	0.0630***	0.0516***
	(0.00313)	(0.0117)	(0.00312)	(0.0120)
Log Firm Size	0.0342***	0.0189***	0.0344***	0.0193***
	(0.00104)	(0.00362)	(0.00105)	(0.00354)
Constant	-0.152***	-0.0550***	-0.153***	-0.0564***
	(0.00520)	(0.0198)	(0.00515)	(0.0193)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	No	Yes	No	Yes
Parent Country Fixed Effect	No	Yes	No	Yes
Parent Country-Time Fixed Effects	No	Yes	No	Yes
Observations	270,037	157,191	270,037	157,191
Prob>chi2	0.0000	0.0000	0.0000	0.0000
R-squared	0.015	0.812	0.015	0.812

The dependent is Pr(MNE) highlighted. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All data used to construct the variables for the analysis is obtained from the Orbis database. Debt is measured as (current liabilities + other current liabilities) + (non-current liabilities + other non-current liabilities). Asset is measured by the total asset the parent firm holds (USD millions). Profitability is derived as net profits divided by total assets. Debt to Asset is obtained by dividing debt by Asset. Tang (Tangibility) is measured as the ratio of fixed assets to total assets. The leverage variables are rations. This is also the same for Profit (profitability) and Tang (tangibility), while the firm size, measured as the number of employees, is scaled in a natural log form.

Although the results of Model 1 are sufficient, several limitations will need to be addressed. Firstly, the heterogeneity in the sample does not only fall within the scope of individual firm characteristics but across time and parent country. Therefore, I take a step further to account for individual parent and subsidiary country characteristics, time-fixed effects that account for factors that change over time, and country-time-fixed effects, which control for shocks that impact China in a specific way. Secondly, there is a danger of heteroscedasticity in Models 1 and 2, which can result in inefficient parameters, standard error estimates, and inaccurate p-values. Therefore, I cluster the standard errors at an industry level to account for this. There is also the potential problem of non-normality. However, non-normality is considered trivial when estimating moderate to large-size samples (Wooldridge, 2010). Given the study's large sample of 270037 firm-year observations, non-normality is not a concern.

Model 2 incorporates all the factors that the OLS estimation and Model 1 lack. Similar to Model 1, Model 2 examines the impact of firm leverage (Debt to Asset) on a firm's propensity to pursue international investment. However, Model 2 incorporates firm, country, and time-country fixed effects. Additionally, it remedies possible heteroscedasticity by clustering standard errors at an industry level. It is important to note that a key advantage of adopting an LPM with fixed effects instead of a logit model is that we find that the logit model uses only observations that have within variations in the dependent variable (MNE). I conducted a simple logit model; the results are not reported here and found that the observations were substantially reduced. Also, with the LPM, I can account for all the aforementioned fixed effects and incorporate clustered and robust standard errors. Based on Model 2, I find that the effect of leverage (Debt to Asset) on MNE is negative and statistically significant at a 5% significance. The result indicates that a 1 unit increase in leverage (Debt to Asset) leads to a 0.332% decrease in the probability of firms pursuing international investment. I also find that at a 1% statistical significance level, a 100% increase in the firm profitability and tangibility will result in a 0.0064% and 5.29%, respectively, increase in the propensity of firms to seek international investment opportunities. Additionally, a

100% increase in firm size will result in a 1.89% in the dependent variable. Therefore, all four hypotheses developed in this chapter are supported by the findings from the LPM. This is an important finding for at least two reasons. First, as discussed in the literature review section, most work on leverage and investment has focussed on domestic investment rather than international investment. This study is among a handful of studies to provide insights into leverage and internationalisation, and the data support the hypotheses developed conceptually. Second, our methodological contribution appears to be very impactful. In particular, results based on commonly used techniques such as OLS appear to be reversed when the more sophisticated LPM is used, and the results from the latter appear to be more closely aligned with theoretical predictions. As stated earlier, this is the first study to examine the effect of leverage on the probability of Chinese firms pursuing international investment via mergers and acquisitions using the LPM.

As a robustness check to the findings of columns 1 and 2, I re-estimate these models but with a different measure of leverage. In particular, following discussions in 4.4.3. I replace debt to assets with debt to capital. The corresponding models are presented as Models 3 and 4, respectively, in Table 4.5. Similar to model 1, model 3 only accounts for firm fixed effects. The findings for Model 3 qualitatively correspond to the findings of Model 1. In particular, the impact of leverage (Debt to Capital) on MNE is negative and statistically significant. Specifically, the estimation results show that a 1 unit increase in leverage (Debt to Capital) will lead to a 0.006% reduction in the probability of Chinese firms pursuing international investment. I find that this result is significant at a 10% significance level. Similar to Model 1, we learn that the effect of firm tangibility and size on MNE is positive and statistically significant at a 1% significance level. The findings indicate that a 100% increase in tangibility will result in a 6.30% increase in the probability of pursuing international investment. The result also shows that a 100% increase in firm size will lead to a 3.44% increase in the dependent variable. Additionally, model 3 indicates that profitability has a positive effect on the propensity of a firm to pursue international investment. However, this result is not statistically significant.

Similarly, the findings of Model 4 correspond to those in Model 2 qualitatively. In particular, the model results indicate that a 1 unit increase in leverage (Debt to Capital) will result in a 0.0223% reduction in the probability of a firm internationalising. I also find that the effect of profitability, tangibility, and firm size on MNE is positive and statistically significant. Specifically, the results indicate that a 1 unit increase in profitability and tangibility will result in a 0.002% and 5.16%

increase in the probability of a firm pursuing foreign investment. The result finds that a 100% increase in firm size will result in a 1.93% increase in the dependent variable.

Given the recorded R-squared of all four models, models 2 and 4 have a relatively higher statistic of 81.2% than Models 1 and 2. This indicates that incorporating high-dimensional fixed effects into the linear probability model improved the model. The R-squared is used to measure the goodness of fit, similar to Gronau (1998), who accentuates that the R-square serves as a superior measure of goodness of fit in the binary choice model, especially for linear probability models. Next, I delve into the details of the findings with respect to each explanatory variable.

Leverage

All the models convincingly show that the relationship between leverage and internationalisation is negative and statistically significant. The results suggest that a high level of debt would lower the probability of Chinese firms pursuing international investment via cross-border mergers and acquisitions. Additionally, I find that our results are consistent with the extant literature (Lang et al., 1996; Aivazian et al., 2005; Uysal, 2011; Egger and Kesina, 2013). Also, these results can be explained from the perspective of both overinvestment and underinvestment.

According to the underinvestment theory, one consequence of debt financing and a firm incorporating high leverage levels is its influence on its investment and expansion policy. Model 2 and Model 4 results indicate that the presence of outstanding (risky) debt in Chinese firms leads to potential underinvestment problems. This result is based on the notion that firm managers will be deterred from pursuing lucrative international investments because the returns are transferred to the creditors. By focusing on Chinese parent companies as acquirers, I establish that overleveraged acquirers are potentially restricted by their capacity to issue any capital to pursue international investment. This is because overleveraged firms have limited financial flexibility as they cannot generate internal financing and obtain further debt financing because of previous debt obligations. Hu and Yang (2016) suggest that highly leveraged firms are restricted by financing fictions that restrict the capability of highly leveraged firms to acquire targets in aggressive bidding acquisitions or hostile takeovers. Similar to Shukla and Shaw (2021) study on India, I find that after controlling for firm, time, country, and country-time fixed effects, Leverage deters the firm's capacity to mobilise internal and external resources for financing new investment projects (Uysal, 2011). Also, it can discourage shareholders from supporting capital expenditure through increased borrowings, as in a situation of high leverage, significant gains from investments may accrue to the debtholder.

The results of Model 2 and Model 4 are also consistent with the overinvestment theory and find that leverage plays potentially plays a disciplinary role in Chinese MNEs. As explained in the literature, managers will seek to pursue international investment despite its negative NPV because of the availability of cash flow. To manage this, debt is utilised as a governance mechanism that restricts cash flow availability and pre-commits managers to debt obligation payments. Studies such as (Lang et al., 1996; Aivazian et al., 2005) find that this relationship is more apparent for firms in developed countries. However, Firth et al. (2008) indicate that the overinvestment problem is exacerbated for MNEs from state-capitalist countries such as China. Chinese SOEs have the advantage of soft budget constraints (Dong and Putterman, 2003; Hu and Yang, 2015). Also, Chinese SOEs bear heavy policy burdens, such as high capital intensity in strategically important sectors, suggesting high financing costs and costs related to retirement pensions, welfare, and hiring redundant workers (Lin et al., 2020). SOE managers often attribute loss and non-profitable investment decisions to these heavy policy burdens, thus masking policy performance. Because the government has a stake in SOEs, the state will bail out financially distressed SOEs, effectively creating soft budget constraints and enhancing financial flexibility.

Although this might be the case, private Chinese firms do not have the same soft budget constraints as their SOEs counterparts. Moreover, China's state-owned banks discriminate against private firms in lending decisions (Brandt and Li, 2003). The limited government affiliations inherent in private firms indicate that they are not burdened by heavy policy burdens and are not forced to push government interest. Therefore, private MNEs' capital structure policy is predominantly focused on maximising shareholder wealth. As a result, the probability of a government bailout is lower for private firms relative to SOEs. This indicates that private firms face a high risk of bankruptcy and limited financial flexibility than SOEs if overleveraged. Therefore, when faced with over-investment problems, the shareholder of private firms with little government affiliation will result in debt obligations to restrict the investment activities of the management (Brandt and Li, 2003; Cull and Xu, 2003; Firth et al., 2005; Lin et al., 2020).

Profitability and Tangibility

Regarding profitability and international investment, the results in Model 2 and Model 4 consistently show that firm profitability has a positive and significant impact on Chinese firms' probability of internationalisation. I find that this result is in line with the pecking order theory, which indicates that profitable firms will endeavour to utilise internal financing because of the cost associated with external funding. It further suggests that profitable firms will prefer to pursue

foreign investment using retained earnings as a strategy to avoid possible agency problems and information asymmetry between managers and external shareholders. Therefore, the result is consistent with the assertions of the pecking order theory, which indicates that profitable firms are more inclined to pursue investment.

With regards to the ownership structure of the firms, Studies such as Lim et al. (2012), Firth et al. (2008), and Zhengwei and Li (2013) accentuate that Chinese private-owned firms face more financial friction in financing investment activities. A primary reason is that private firms are considered riskier than Chinese SOEs, partly highlighting the prevalent perception of credit guarantees in the Chinese financial system, which tends to be more favourable to SOEs (Firth et al., 2008). This is because the Chinese government is the majority shareholder of SOEs, and so the perceived likelihood of SOEs defaulting is low due to the possibility of bailout privileges. As such, privately owned Chinese firms rely on their retained earnings and are relatively more conservative than SOE firms regarding debt financing. Additionally, private Chinese firms tend to utilise internal funding, considering the inefficient state of bankruptcy laws in China compared to developed economies.

Thirumalaisamy (2013) offers a different perspective regarding emerging economies by accentuating that retained earnings significantly finance corporate firms, and this trend is most commonly observed in high-growth profitable firms. In this line, Gilchrist and Himmelberg (1950) accentuate that internal financing conveys information about the growth and investment forecasts of the companies. Profitable firms pay lower dividends and limit the use of debt because they reinvest more of their retained earnings and provide a greater percentage of their total returns in the form of capital gains (Thirumalaisamy, 2013). However, low-growth and less profitable firms will seek to maintain a stable payout of the dividend because they are more risk-averse to taking on foreign investment. In addition, profitability serves as an indication of the firm’s financial position and firm performance in the extant literature. Profitable firms are characterised to have effective management styles, high performance, and are less financially constrained, thus enabling them with the capacity to pursue outward foreign direct investment opportunities.

In relation to tangible assets, the findings in Models 2 and 4 indicate that an increase in the asset tangibility of Chinese firms increases the firms' probability of pursuing international investment. The findings are also consistent with the existing literature (Lyandres and Palazoo, 2016; Almeida and Campbell, 2007). Asset tangibility is a crucial factor that determines investment

decisions. In the scenario a firm seeks to pursue external financing, tangible assets are regarded as collateral by the debt holders, thus reducing the financial constraint of firms in the absence of internal funding (Reddy and Babu, 2008). This indicates that Chinese firms have a higher propensity to invest internationally if their asset tangibility is high. In the absence of internal financing, it creates a higher collateralised debt capacity. This allows the firms to pursue debt financing at a reduced cost.

Firm Size

The findings of the estimation in Table 4.5 indicates that the size of Chinese firms has a consistently positive impact on the probability of pursuing international investment. This finding is consistent with the extant literature, like Blomstrom and Lipsey (1991), that accentuates that MNEs are distinct from other firms because of their large size and large market capitalisation. These factors give them an advantage in terms of accumulating a substantial amount of internal financing through more enormous profits and obtaining easier access to external funding than smaller and domestic firms. Thus, accentuating that larger firms possess relatively more resources, increasing their capacity to pursue foreign acquisitions. Also, larger firms have a competitive advantage and are more efficient than smaller firms because they can gain from economies of scale. This increases the chances of larger firms embarking on new investment opportunities because economies of scale provide larger firms with a cost advantage when increasing production and investment (Kadapakkam et al. 1998).

4.6 Further Robustness Checks

I will now conduct further robustness checks by using further measures of leverage, particularly (i) short-term debt to total assets and (ii) long-term debt to total assets. These variables were discussed in section 4.4.3. and used in Aivazian et al. (2005). The findings will also help to determine which of these forms of debt have more of a significant effect on international investment. The results of this exercise are given in Table 4.6 as Models 1 and 2 for the short-term debt and long-term debt, respectively.

The results in Table 4.6 are largely consistent with the earlier finding and thus corroborate the earlier results and discussions. Short- and long-term debt have a negative impact on the probability of a firm becoming an MNE, although short-term debt is not statistically significant. The result shows that a 1 unit increase in long-term debt to asset will result in a 3.28% decrease in the probability of firms pursuing international investment. Long-term leverage is firm debts

with a maturity period of over one year. This indicates that overleveraged firms with a high degree of long-term debt will be liable to transfer wealth from shareholders to creditors until the debt matures. Ultimately MNEs will be exposed to transfer investment returns to the creditors, which last for an extended period post the international acquisition. Concerning this, Hu and Yang (2015) also clarify that cross-border mergers and acquisition deals usually have positive short-term returns but have negative abnormal returns, especially for firms with higher leverage. Meyer (1977) also argues that a firm's incentive to deviate from a value-maximising strategy is eliminated if the debt should mature before growth options or investment projects are executed. Additionally, this wealth transfer can be mitigated if shareholders have the option to renegotiate the original debt contract upon financial distress. Without the opportunity to renegotiate, the wealth transfer from shareholders to creditors reduces the value of the shareholders' choice to go bankrupt.

With regard to the other explanatory variables in the models, given that the results appear very similar, I will focus the discussion on Model 1. The effects of firm size, profitability, and tangibility on MNE are positive and statistically significant. Specifically, a 1 unit increase in profitability and tangibility will lead to a 0.0050% and 5.25% increase in the probability of internationalisation, respectively. Additionally, the result finds that a 100% increase in firm size will lead to a 1.89% increase in the dependent variable.

Table 4.6 Linear Probability Regression Results – Robustness Checks

	(1)	(2)
Variables	**Pr(MNE)**	**Pr(MNE)**
Leverage (Long Term Debt to Asset)		-0.0328***
		(0.0115)
Leverage (Short Term Debt to Asset)	-0.00231	
	(0.00157)	
Leverage (Debt to Asset)		
Firm Size	0.0189***	0.0190***
	(0.00363)	(0.00358)

Profitability	0.0000509**	0.0000388***
	(2.27e-05)	(8.27e-06)
Tangibility	0.0525***	0.0541***
	(0.0117)	(0.0124)
Constant	-0.0557***	-0.0566***
	(0.0199)	(0.0196)
Observations	157,191	157,191
R-squared	0.812	0.812
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Parent Country Fixed Effects	Yes	Yes
Parent Country-Time Fixed Effects	Yes	Yes

The dependent is Pr(MNE) highlighted. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All data used to construct the variables for the analysis is obtained from the Orbis database. Debt is measured as (current liabilities + other current liabilities) + (non-current liabilities + other non-current liabilities). Asset is measured by the total asset the parent firm holds (USD millions). Profitability is derived as net profits divided by total assets. Short-Term Leverage (Short-term debt) is derived as Debt (current liabilities + other current liabilities) divided by Asset. Long-term Leverage (Long-term debt to Asset) is measured as Debt (non-current liabilities + other non-current liabilities) divided by Asset. Tang (Tangibility) is measured as the ratio of fixed assets to total assets. The leverage variables are rations. This is also the same for Profit (profitability) and Tang (tangibility), while the firm size, measured as the number of employees, is scaled in a natural log form.

4.7 Conclusion and Policy Implication

The study of capital structure and investment in the literature is extensive. Notable studies such as Myers (1984), Lang et al. (1996), and Aviazian (2005) conclude that agency theory can explain the capital structure and investment nexus, while others such as Frank and Goyal (2003) recommend incorporating pecking order theory to explain how factors such as firm size, profitability and tangibility affect international investment. This chapter includes both approaches to understanding the influence of capital structure on investment decisions in firms from emerging economies. Using Chinese parent firm-level data, this study estimates the effect of firm leverage and other factors, such as firm size, profitability and asset tangibility, on these firms' international investment via cross-border M&A.

The current study differs from existing work in the literature is several ways. (i) Most of the work seems to focus on the link between leverage and domestic investment. Only a handful of studies look at leverage and international investment. Even fewer studies focus on emerging economies as home countries seeking to pursue international investments. The most relevant studies to this work are those of Hu and Yang (2016) and Egger and Kesina, 2013). Hu and Yang (2016) examine leverage and cross-border M&A in a panel of 57 countries from 1990 to 2010, while Egger and Kesina (2013) look at leverage and exporting. This study will contribute to the discussions on leverage and international investment by using a unique Chinese firm-level dataset. The data consists of about 200,000 observations containing information about Chinese firms that become MNEs, including information about the locations of the subsidiaries they acquire. (ii) Distinct from existing studies that focus on the leverage and investment nexus, this study adopts a linear probability model with high dimensional fixed effects to control for heterogeneity in the sample. The firm fixed effect captures the distinctive firm characteristics that can affect international investment strategies and performance. I control for systematic and institutional differences between the countries by incorporating country-fixed effects. I account for the potential heterogeneity that occurs across time and includes country-time fixed effects to time shocks that affect each country differently. As a robustness check to my findings, I employ four leverage measures: debt-to-asset ratio, debt-to-capital ratio, short-term debt-to-asset ratio and long-term debt-to-asset ratio.

The findings generally support all the hypotheses developed in this chapter. Concerning leverage, I find the relationship between leverage and international investment is negative, consistent with the findings on leverage/domestic investment and with the theoretical and empirical literature on underinvestment, overinvestment and pecking order theories. Therefore, these findings provide new insights into our understanding of leverage and international investment using a unique and different type of data employed in the literature. The use of the linear probability model within this context also adds some novel information to the literature. In particular, I find using the linear probability model produces slightly different results than commonly used techniques such as OLS. Moreover, the results from the linear probability model appear to be more closely aligned to theoretical predictions than findings from the OLS model. Although the results on the link between leverage and internationalisation are consistent with theoretical predictions, it was not always clear that the empirical findings would support the hypothesis from the perspective of the institutional context of China. A number of Chinese firms are state-owned enterprises and are often supported by state-owned banks. Also, within the

context of the support being provided by the government of China in terms of its Go-Abroad policy, it was not always clear that the overinvestment and underinvestment theories would hold in the context of Chinese firms. But it does. One possible explanation may be due to the fact that my dataset consists of both state and privately-owned enterprises. The fact that privately owned enterprises do not benefit from the same level of financial support as state-owned enterprises, the share of privately owned companies may have influenced the findings.

Under the underinvestment theory, Chinese MNEs seeking to pursue international investment will be deterred if their level of leverage is high, as managers will be reluctant to pursue international investment as future gains will be transferred to creditors rather than shareholders. The overleveraged are restricted financially and will be unable to generate either internal or external financing that can be used to pursue international acquisitions. The findings also support the overinvestment hypothesis that debt can be used as a mechanism to kerb agency problems that result from management pursuing poor international investment ventures due to cash flow availability. Concerning pecking order theory, I find that the more profitable Chinese MNEs are, the more likely they are to pursue international investment, as profitable firms have greater access to retained earnings and use this form of internal financing in preference to debt or equity because it has a lower cost of capital.

Based on the findings of this study, I put forward the following policy implications. Firstly, the Chinese government predominantly provides access to affordable external finance to state-owned MNEs, so the managers of these firms are prone to overinvest leading to underperforming loans. As such, the government shareholders of these firms need to increase the monitoring and enforce stronger control mechanisms to restrict the manager's proclivity to invest in investments with negative returns. By doing so, the government can ensure that commercial lending criteria are applied to SOEs and strengthen corporate governance by improving the scrutiny of managerial decisions on the use of free cash flow among collective and private firms. Secondly, for firms, the study highlights the importance of managing leverage effectively when investing in China. Firms need to be aware of the risks associated with high leverage levels, such as increased default risk and higher borrowing costs, which can impact investment decisions. Firms also need to consider the impact of leverage on their financial flexibility, as high levels of debt can limit their ability to respond to changing market conditions. Therefore, firms should aim to maintain an optimal level of leverage that balances the benefits of debt financing with the associated risks.

The study suggests that policymakers should be aware of the role of leverage in influencing international investment decisions. Governments may need to consider providing incentives or disincentives to encourage firms to manage their leverage in a way that is conducive to international investment. This can include policies that promote responsible lending practices, such as requiring lenders to conduct due diligence and monitor the financial health of borrowers. Additionally, regulators may need to consider implementing policies to ensure that the financial system is stable and that leverage levels are kept within safe limits. Additionally, access to financing is currently biased in favour of SOEs. Private Chinese MNEs do not have the same privileges and access to soft financing due to their low degree of state affiliation. In order to ensure ethical business practices and equally enhance the financial capability of not just SOEs, but private firms, the government should focus on equal and effective financial institution and administrative reform.

4.8 Limitation and Future Research

This research has some limitations that may suggest trajectories for future research. First, numerous studies indicate that state ownership and the degree of government affiliation affect firm strategy, behaviour, and leverage decision differently when considering international investment opportunities. However, I have not distinguished between SOEs and private firms in the sample because of data restrictions. Therefore, a clear distinction should be established, and an econometric analysis should be undertaken to obtain clearer results for future research. Secondly, although I found viable results, I only constructed the leverage ratios using book-to-book values because of data restrictions. Given that there are other methods of constructing leverage ratios, it would be interesting to determine if this chapter's findings are consistent if book-to-market values are adopted. Thirdly, cross-level research on firm-level factors that collectively affect international investment is not exhaustive. For example, political home country and institutional factors have been shown to affect internationalisation. To account for this, we controlled for country-specific differences by incorporating country and country-time fixed effects. In future studies, country-level variables that may affect international investment, such as cultural distance, exchange rate and institutional variables, could be added.

CHAPTER 5 THE EFFECT OF INWARD FOREIGN DIRECT INVESTMENT ON HOUSE PRICES IN CHINA

5.1 Introduction

Since its trade liberalisation economic reforms in the 1970s, China has had the largest inward FDI among emerging economies and the second largest in the world after the United States (UNCTAD,2019). During the 1980s and 1990s, numerous foreign multinational corporations set up factories and business ventures in China. The increased inflow of FDI was bolstered by implementing economic reforms such as establishing Special Economic Zones (SEZ). International partners in these zones were incentivised to enable investment in those regions (Wong et al., 2019). In 1984, China's state council designated 14 coastal cities where foreign investors could enjoy tax incentives (Hui and Chan, 2014). In 1985, 12 of these 14 cities were also established as technology transfer promotion zones to accelerate technology transfer (Fung et al., 2008). In the same year, the 'development triangles' of the Yangtze River Delta, the Peral River Delta, the Min Nan region, the Liaodong, the Shandong Peninsulas and the Bohai Sea Coastal Region were opened to foreign investment.

The success of these policies and the inflow of FDI propelled China towards becoming a more urbanised country, and IFDI contributed to the economic growth and development of many provinces in China and promoted the effective restructuring of their industries (Lui and Ma, 2021). For example, the real estate sector expanded significantly due to FDI inflow. Sustained economic growth, increased wages, and the enhancement of China's socio-economic conditions have also increased residents' ability to afford real estate for both consumption and investment purposes (Lui and Ma, 2021). A natural consequence of the rapid increase in household income has led to the strong aspiration for homeownership, hence driving up the demand for and price of private residential property (Choy et al., 2015).

The residential housing market has become a significant segment of economic activity and has provided a sizable tax base for the government (Yanyun Man et al., 2011). Between 1998 and 2000, numerous housing reforms were implemented, which entailed abolishing the provision of welfare housing and establishing a market-oriented housing provision system and a vigorous housing market (Chen et al., 2011). The land reforms in the 1980s, which separated transferrable land-use rights from state ownership (Yanyun Man et al., 2011), also led to increased investment and development as residents were allowed to own property. These reforms contributed to the

sector's attractiveness, thus encouraging IFDI in the real estate market. The reforms and the institutional context of the real estate sector are discussed in Chapter 2.2.1. As elaborated in Chapter 2.2.1, the real estate sector now accounts for the second-largest FDI inflow, and house prices have quadrupled (Liu and Ma, 2021). China's average cost of residential housing per square meter increased from ¥3,717.78 in 2006 to ¥12,848.45 in 2019. Some commentators suggest that this may be indicative of a housing bubble far worse than the 2008 US subprime mortgage crisis (Financial Times, 2018; Bloomberg, 2018). A housing bubble is measured as the divergence of real estate prices from fundamental values.

Many studies have found that IFDI enhances economic growth through capital inflow, technology and knowledge spillover (Borensztein et al., 1998; Wei et al., 2007). This has guided research into understanding the effects of IFDI on specific sectors. The housing sector has also been studied from that perspective. Studies such as Sa et al. (2014) provide evidence to show the positive relationship between IFDI and house prices. Another channel through which house prices can increase through IFDI is increased market speculation, which implies increased volatility in house prices. The housing market and IFDI, therefore, appear to be intrinsically linked. Not surprisingly, studies such as Choy et al. (2013) and Kim and Yang (2011) discuss that it is impossible to understand the urban dynamics of China's economy without comprehending factors such as IFDI and its effect on the real estate market. This chapter intends to contribute to the discussion on the impact of IFDI on house prices in China. The existing work on this topic has either primarily looked at the aggregate effect of FDI on house prices in China, e.g., Bo and Bo (2017), Wen (2021) and Feng et al. 2017) or has looked at housing sector IFDI on house prices, e.g. Huang et al. 2017. There is very little work that looks at the regional aspect of IFDI and house prices. Figure 5.1 illustrates the regional provinces of China. Figure 5.2a shows that the amount of IFDI varies considerably according to the regions in China. Figure 5.2 b shows that house prices also vary substantially depending on the region. As discussed in Chapter 2 (Institutional Context), coastal regions, such as Guandong and Jiagsu, have benefitted from policies designed to attract IFDI, and I can see from the Figures 5.2a and 5.2b that they have attracted a substantial amount of IFDI and house prices in coastal regions are considerably higher than middle and western regions House prices in the eastern coastal regions, especially Shanghai, are higher than those in the middle and west (Liang and Gao, 2007). In 2019, the average residential property in Shanghai cost ¥47,829 per square meter, which is substantially higher than in Yunnan and Xinjiang, in which the cost was ¥7,639 and ¥6,747.

Hu (2002) argues that FDI contributes to regional inequality in China, and FDI inflow and its benefits are not distributed evenly across China. Chen (2015) and Ouyang and Yao (2013) found that coastal areas with better access to foreign markets and public infrastructure are the primary locations for FDI. It is therefore important to understand what role IFDI plays in terms of creating regional inequality so that policies designed to attract IFDI can be adjusted. This is to ensure that IFDI does not create regional disparities, not just in the case of China but in all developing countries where much focus is currently on attracting IFDI.

Figure 5.1 Map Illustrating China's Provinces

Figure 5.2a Regional FDI – 2019

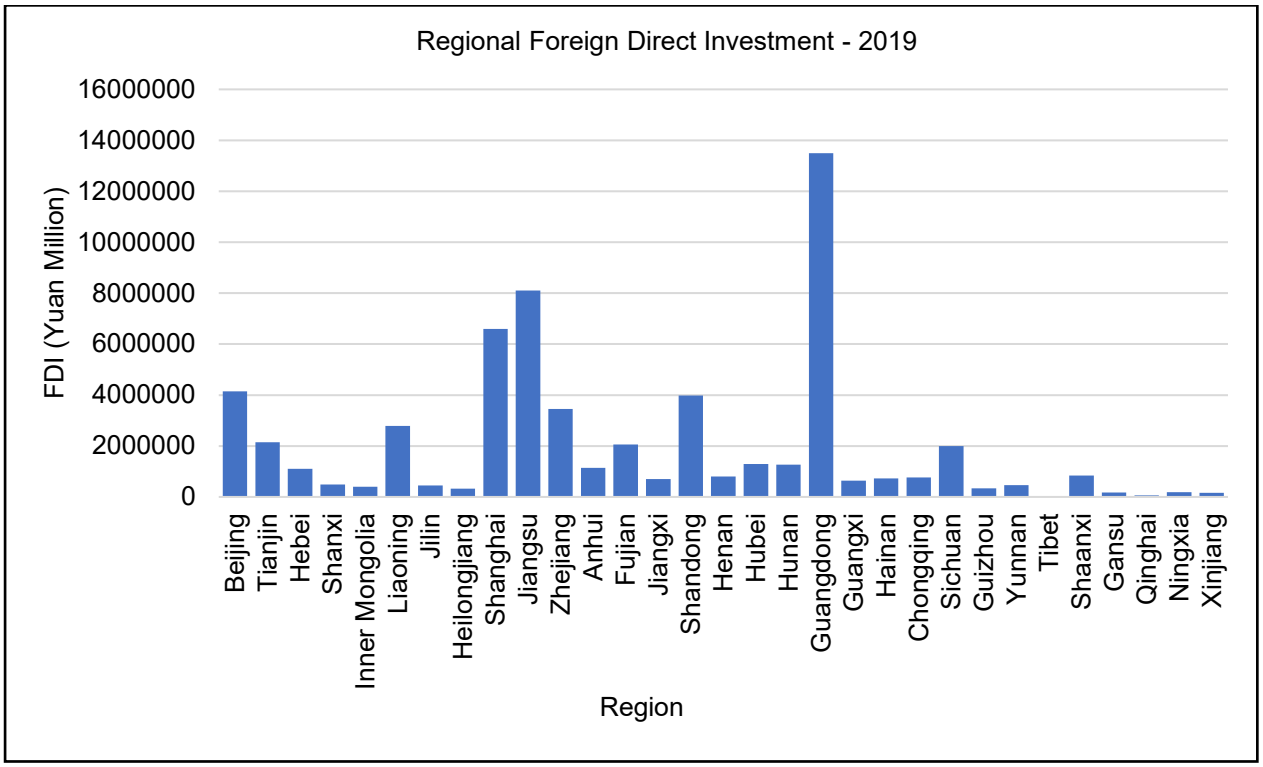


Figure 5.2a illustrates the inward foreign direct investment of each of China's provinces for the year 2019. This data was obtained from China's National Statistical Year Books (2019).

The discussions above and Figures 5.2a and b warrant a closer look at the regional aspects of both IFDI and house prices. Therefore, investigating the links between IFDI and house prices at a regional level will be the primary contribution of this chapter. There are a couple of regional studies on IFDI and house prices on which this study will be building on. Kuang et al. (2011) investigated the effect of FDI on house prices in 31 large and medium cities and finds that FDI has a positive and statistically significant effect on house prices. Choy et al. (2015) investigates the link between IFDI and house prices for 21 cities within Guandong and finds that FDI has a positive and significant effect on housing prices. The main difference between the current study and the existing similar studies, such as Kuang et al. (2011) and Choy et al. (2015), is that this the current study uses a much broader dataset encompassing 30 of China's provinces, whereas previous studies have either focussed on some cities or one particular province.

Figure 5.2b Regional FDI – 2019

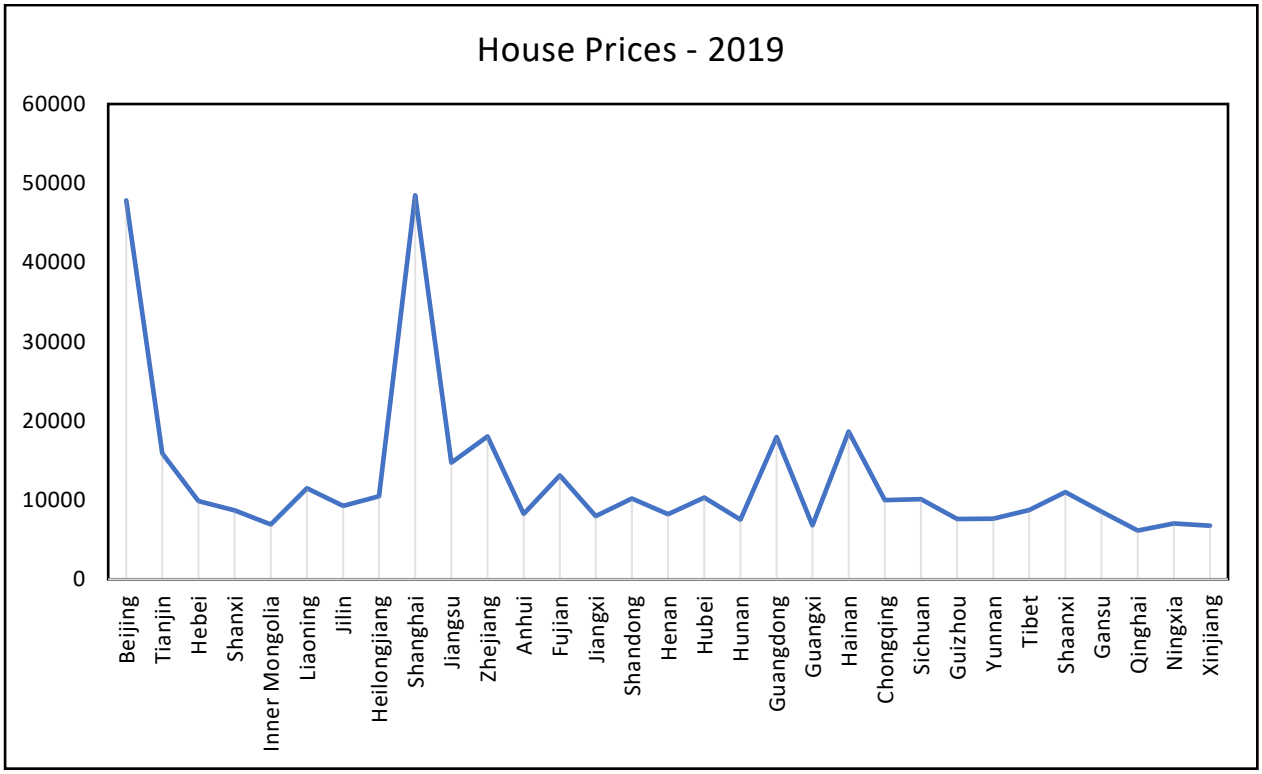


Figure 5.2b illustrates the house prices of each of China's provinces for the year 2019. This data was obtained from China's National Statistical Year Books (2019).

A second contribution of this chapter will be to investigate the impact of air pollution on house prices. It is broadly acknowledged that air pollution is detrimental to health and can adversely affect telecommunication and traffic infrastructure and deteriorate the sustainability of buildings (Sun et al., 2017). China's air quality is notoriously poor. Over the past three decades, China has experienced large scale and rapid urbanisation, especially in urban regions. Zhou (2019) indicates that over 500 million people have relocated to urban areas in China since the 1970s. This increase in population results in an increase in consumption patterns, especially fuel consumption in motor vehicles. Sun et al. (2017) report that from 2000 to 2017, the number of vehicles in urban areas increased from 16.9 to 288 million. These factors contribute to high levels of ambient air pollution in China's provinces (Zou et al., 2019; Sun et al., 2017). According to the World Health Organisation (WHO), China is the world's deadliest country for outdoor pollution: more than 1 million people died from polluted air in China in 2012.[15] According to *China Daily*

[15] China tops WHO list for deadly outdoor air pollution | Pollution | The Guardian

(2014), 90% of China's large cities failed to meet air quality standards in 2014.[16] Additionally, based on the 2015 estimates by the Chinese Academy for Environmental Planning (CAEP)[17], emissions of PM2.5, sulphur (SO2) and nitrogen dioxide (NO2) substantially exceeded China's cities' environmental absorptive capacity by 80 per cent, 50 per cent and 70 per cent respectively (World Bank, 2020). Based on the increasingly negative impact of pollution, the Chinese government established the air pollution action plan and the 13th five-year plan (2016 to 2020) to promote energy efficiency and clean energy, focusing on controlling air pollutants (World Bank, 2020).

Tang and Niemer (2021) found that market prices of some goods, including real estate, reflect a premium on quality amenities, such as clean air, even though these amenities do not carry explicit prices. The assessment of the economic cost and benefit of clean air is of increasing significance to economists and policymakers. Although there is a small body of literature investigating the housing price response to clean air, the evidence for China is limited. Studies focusing on the detrimental effects of air pollution adopted particulate matter (PM2.5) as a measure of air pollution, e.g. Lui et al. (2020). China is a mining and manufacturing hub, as well as the most populated country, with high levels of nitrogen oxide[18]. I extend the literature by adopting nitrogen oxide as a measure for air pollution. To my knowledge, no studies have adopted this measure in the context of China in the housing market literature. I am building on existing studies by studying the effects of air pollution using provincial data from China.

The third contribution of this chapter is from a methodological standpoint. In particular, I adopt a novel approach of panel quantile estimation with non-additive fixed effects proposed by Powell (2016; 2022) and implemented by Boumparis et al. (2017) in my investigation. Unlike the majority of the panel data studies in the existing literature, a panel quantile framework allows us to observe the impact of FDI and other macroeconomic demand and supply-side variables across the distribution of house prices rather than merely focusing on their conditional mean. There are a few studies that have adopted quantile estimations in studying house prices but not from the perspective of my investigation. For example, Zietz (2007) adopts a quantile regression approach to study the impact of house type, number of bedrooms, and baths on house prices in

[16] China names 10 most polluted cities[1]- Chinadaily.com.cn

[17]The Chinese Academy for Environmental Planning (CAEP) was founded in 2001 is a public institution with its own legal status with the mission to provide technical support and service such as environmental planning and monitoring, environmental policy and management for the Chinese government.

[18] Nitrogen oxide refers to gases produced through various combustion processes, including the burning of fossil fuels in vehicles, power plants, industrial processes, and residential heating.

Utah. Their result differentiated the effect of the chosen explanatory variables across high and low quantiles of the house price distribution. Mark et al. (2010) adopt a quantile regression on Hong Kong real estate prices to identify how differently real estate prices respond to one unit change in housing characteristics. Zhu et al. (2018) adopt a panel quantile estimation approach on panel data from 35 major cities in China and find that the impact of the independent variables is different across different levels of housing prices.

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5.2 Literature Review

5.2.1 Theoretical Framework

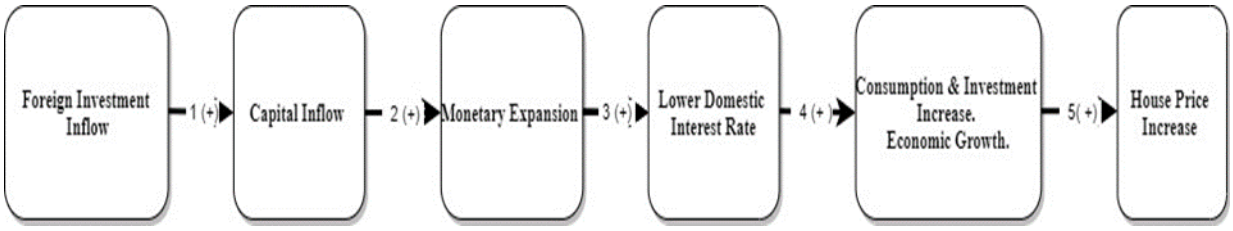
The impact of foreign investment on housing prices has been extensively discussed in the existing literature. A number of theoretical perspectives on how FDI can contribute to a rise in housing prices have been established in studies such as Song and Goa, 2007; Gholiphour (2013) and Kim and Yang (2011). The following sub-sections discuss the mechanisms through which FDI affects house prices.

5.2.1.1 Demand-Driven Mechanism

The demand-driven channel emphasises that an inflow of FDI impacts house prices through increasing housing demand and economic growth (Kim and Yang, 2005). This path is realised in two ways, firstly, through monetary expansion facilitated by capital inflow.

According to Figure 5.3, 1. FDI inflow is a significant source of capital that enhances both micro- and macroeconomic activities in developing and emerging economies (Borensztein et al., 1998; Alfrado et al., 2010). 2. Capital inflow fundamentally results in expansionary monetary policy, which facilitates economic growth by enhancing finance for domestic investment (Kim and Yang, 2011). 3. An expansionary monetary policy results in higher liquidity for banks; as a result, commercial banks can lend at a relatively lower interest rate (Kim and Yang, 2013; Umar et al., 2020).

Figure 5.3 Demand-Driven Channel



4. Lower interest rate makes it easy for consumers to borrow and obtain a mortgage at a cheaper rate, which leads to an increase in consumer affordability (Mishkin, 2007). The increase in affordability drives demand for houses up as consumption and asset investment becomes much more attractive (Caias and Ertl, 2017). This increased level of investment and consumption generates an economic boom and enhances living standards (Gholipour, 2013). 5. In sum, an increase in investment and consumption raises the demand for residential property, thus raising prices (Gholipour, 2013; He and Zhu, 2013; Guest and Rohdes, 2017). Also, the appreciation of property prices tends to be inelastic, which indicates that growth in house and rental prices do not decrease the demand in the short term. As a result, changes in the domestic economy primarily impact the housing market.

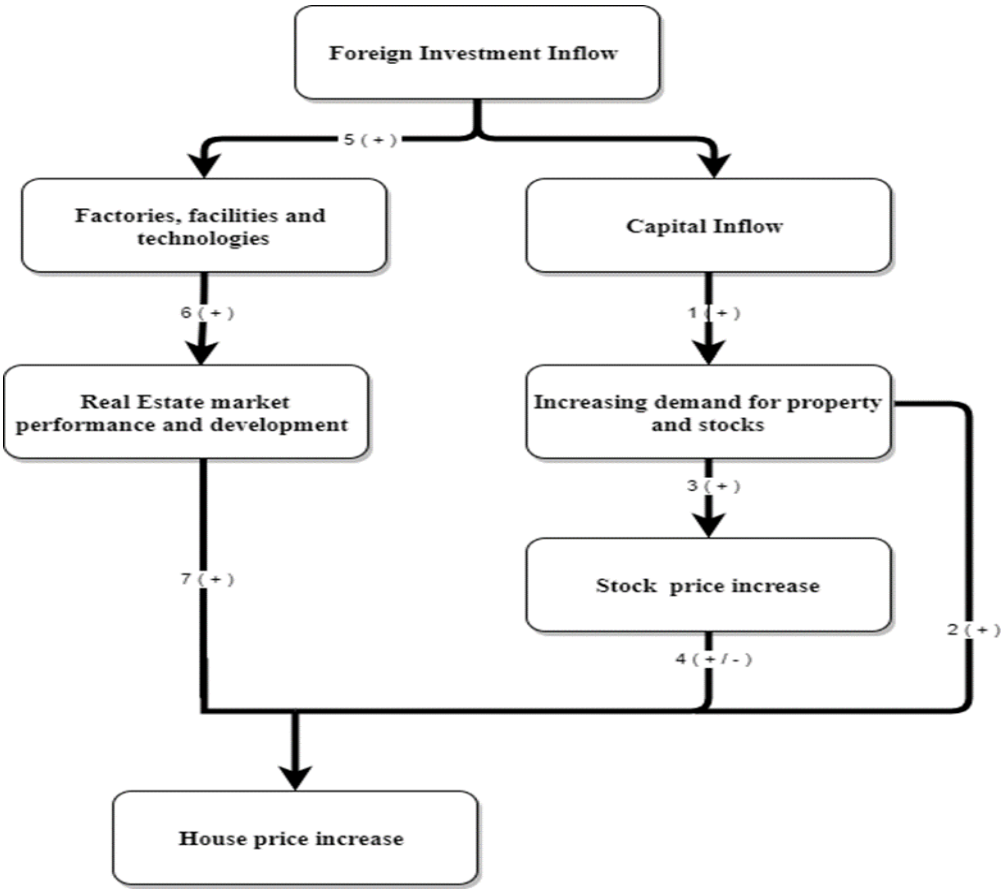
5.2.1.2 Property Demand-Driven Mechanism

In the property demand-driven path, FDI is also stated to impact residential property prices. According to Figure 5.4, 1. In this channel, FDI causes an inflow of capital into financial markets which is accompanied by exchange rate appreciation, an increase in liquidity, and a rise in asset prices (Kim and Yang, 2008). Like the demand-driven channel, foreign investment increases housing demand and supply as consumption and investment increase. This, in turn, places pressure on house prices upward (Bagchi-Sen, 1995). 2. As a result of profit-seeking FDI, capital inflow contributes to increasing speculative demand, thus causing the housing market to increase (Song and Goa, 2007) continuously. According to Gholipour (2013), this sequence begins with credit expansion, followed by increased consumption and investment, and finally concludes with the burst of the bubble. To further explain this channel, Loungani and Razin (2001) indicate that capital inflow increases the demand for financial assets such as stocks and bonds and commodities, namely gold. This is because the influx of capital increases the propensity of individuals to invest more in the financial market and purchase assets such as gold and property. 3. The inflow of capital into the stock market increases the demand for assets, resulting in upward pressure on stock prices (Albuquerque, 2002).

4. House prices can be impacted positively and negatively through the influence of the stock market. The wealth effect is one of the most common channels explaining the connection between the stock and real estate market (Adcock et al., 2013). Under this effect, Markowitz (1952) indicates that high-income households will invariably have the desire to rebalance their portfolios in repose to stock market changes. Whilst Ando and Modigliani (1963) suggest that households with unanticipated gains in share prices will tend to increase the amount of housing stock across their lifecycle. In addition, Sim and Chang (2006) indicate that, while stocks do not involve direct consumption, real estate is regarded as a consumption and investment good. Hence, households with unexpected gains on the stock market are likely to distribute their portfolio to include real estate. Particularly, when stock prices rise, households holding stocks often rebalance their portfolios by selling stock and investing in other assets such as real estate. Thus, stock price and housing price change are expected to be positively related. Distinct from this, effects such as the substitution effect or capital switching effect suggest a negative impact of stock prices on housing prices. Adcock et al. (2013) indicate that substitution occurs when the price of an investment instrument is so high that it is difficult to make profits, and the investor transfer to invest in an alternative investment. Lizieri and Satchell (1997) propose that a higher return on the property will lead to a lower return in the equity market. This is because of a flow of capital investment switching from the corporate sector to the real estate market to ensure maximum return on investment.

5. FDI plays an essential role in transferring new innovative technologies, enabling industrial development and the establishment of advanced facilities and factories through green and brownfield investments (Mohamed et al., 2021). 6 and 7, innovative technologies brought about by FDI contribute to the housing market's development. Advances in technologies such as smart houses and the development of the Internet of Things (IoT) industry have increased the demand for innovative properties and construction-based technology solutions. This has resulted in expanding the housing market in terms of growing demand, thus increasing house prices.

Figure 5.4 Property Demand-Driven Channel



5.2.1.3 Liquidity-Based Mechanism

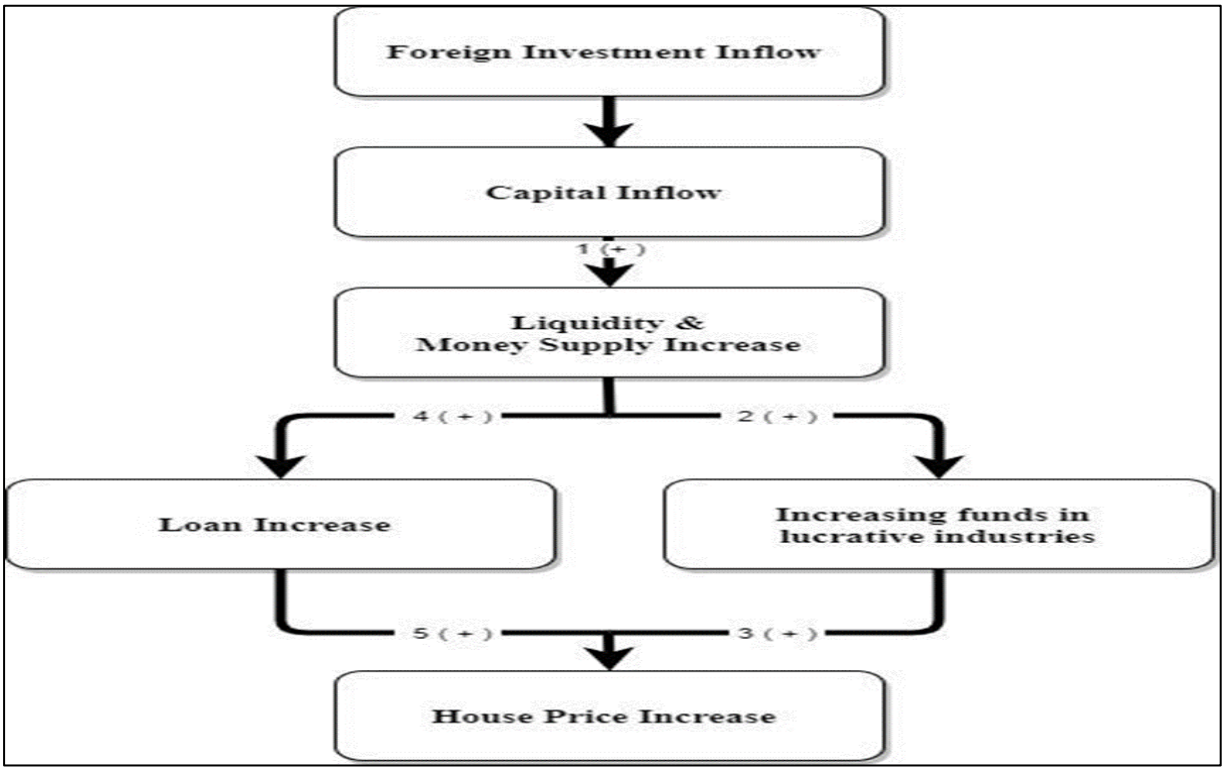
In the liquidity-based channel, foreign investment impacts housing prices through its effect on the host economy's liquidity and money supply. According to Figure 5.5, 1. Capital inflow may result in an increase in money supply and liquidity, which in turn may raise asset prices (Kim and Yang, 2011).

2. Capital inflow tend can potentially result in an appreciation of the nominal and real exchange rate. Monetary authorities will most likely seek to avoid this by pursuing a rigorous monetary policy that involves intervening in the foreign exchange market to counteract excess demand for the local currency by buying foreign currency (King and Yang, 2011; Zhang et al., 2012). This

leads to an increase in foreign exchange reserves and, consequently, domestic money supply (Zhang et al., 2012). 3. The increasing liquidity inflow into the asset market, i.e., the housing market, may further surge asset prices. (Guo and Huang, 2010; Kim and Yang, 2011).

4. Contemporaneously, increasing liquidity in the market would eventually generate more loans in the housing market than can be repaid. 5. This can ultimately result in a sharp escalation of house prices and lead to the generation of an unstable housing bubble (Zhang et al., 2012). More notably, this can result in the accumulation of subprime mortgage loans by banks, which exhibit a high risk of non-repayment, a crucial factor that caused the 2008-2009 US financial crisis. The mechanisms discussed above represent the summary of the theoretical underpinning for this chapter. It has been proposed to be the likely major channel through which foreign investment impact housing prices. Although, it is essential to mention that the actual effect of the specific channels may differ and change across regions, especially since the different provinces in China are faced with diverse contexts of economic development. Hence, this chapter aims to account for the possible differences by controlling for heterogeneous effects.

Figure 5.5 Liquidity-Based Mechanism



5.3.1 Empirical Literature

There has also been a considerable effort to empirically identify significant factors that affect house prices. The literature considers demand-side factors such as income, supply-side factors such as construction costs and land value (Weida and Li, 2012) and macroeconomic elements like monetary policy (Liang and Tiemei, 2007). In addition, following sporadic surges of cross-border investment from particular countries since the 1970s, there is now a body of research on the cost and advantages of international investment in host country industries (Falkenback, 2009; Worzala and Sirmans, 2003). Empirical evidence indicates that foreign investment between economies in the housing market has become increasingly important (Song and Gao, 2007; Kuang et al., 2011), particularly since the occurrence of the sub-prime mortgage crisis, which led to the 2008 global financial crisis causing a fall in both intra- and international markets and real estate activity (Lieser and Groh, 2013; Lizieria and Pain, 2013).

5.3.1.1 Housing Prices and Foreign Investment

In relation to developed economies, Sa et al. (2014) explore the role of capital inflow on the housing boom in 18 OECD countries before the 2008 financial crisis. The study adopts a panel VAR model and uses quarterly data from 1984 to 2006 to investigate how shocks to capital inflow change the mortgage market structure. Using real house prices of these 18 countries as a measure of house prices and real non-residential investment as a proxy for international capital inflow, Sa et al. (2014) find that capital inflow shocks have a significant and positive effect on real house prices. Guest and Rohde (2017) investigate the effect of FDIRE on housing prices in Australia. The study adopts a variety of panel data models that account for cross-sectional heterogeneity across Australian cities. By using FREI by the state as a measure for FDI and the residential property price index as a proxy for housing prices, Guest and Rhode (2017) estimate fixed effects, random effects and general method of moments (GMM) model on a sample period of 2004 - 2014. The results of the study suggest that increases in FDIRE account for between 20% to 30% of the rise in housing prices between 2004 and 2014 in Sydney and Melbourne. However, this effect in other capital cities appears to be negligible.

Using administrative data on properties owned by international companies, Sa (2017) studied the effect of FDIRE in England and Wales. To estimate the causal effect, the study constructs an instrument for FDIRE based on economic shock abroad and adopts an OLS, instrumental variables estimations approach and quantile regression. The results show that FDIRE has a

positive effect on residential property prices at different percentiles of the price distribution. This indicates that FDIRE in the housing market increases the prices of expensive housing and has a 'trickle-down' effect on cheaper properties. The study also finds a significant interaction between housing demand shocks and housing supply. It concludes that increases in FDIRE only appear to increase prices in areas where housing supply is constrained due to land availability or regulatory constraints.

Badarinza and Ramadorai (2018) explore the impact of foreign investment on house prices in London. The study constructs a proxy for foreign investment based on foreign investor behaviour[19] and adopts a difference in difference approach to large housing transaction data. The study finds that FDI is responsible for residential real estate price movements in London, and this effect is long-lasting and associated with immigration. In contrast, Guvercin and Gok (2021) employed quarterly data for 20 European countries over the period 2007 to 2013 to examine the effect of FDI and portfolio investment on residential property prices post the 2008 financial crisis. The study adopts a panel vector autoregression and finds that FDI reduces house prices. They conclude that this is because FDI can provide long-term economic welfare and contribute to house stock which affects house supply, thus leading to a decline in house prices and stability.

Given that a significant amount of foreign investment is transferred to developing and emerging economies, Kim and Yang (2009) examine the effects of the large capital inflow to four emerging Asian economies on asset prices from the first quarter of 1999 to the first quarter of 2006. Through adopting a panel VAR model to control for dynamic effects[20], the study examines the relationship between GDP, capital inflow, stock prices and land prices on asset prices. The study finds that significant capital inflow has appreciated the prices of assets such as stock, land, nominal and real exchange rates.. The study also indicates that in countries such as Indonesia, Malaysia, the Philippines and Thailand, policy measures have been implemented to deal will asset price surges and regulate foreign capital inflow. These include mitigating currency

[19] In Badarinza and Ramadorai (2016) study foreign investment proxy was based specifically of two ideas: Firstly, foreign investors are more likely to invest in the UK property market when their home economies have negative economic conditions; Secondly, foreign investor tend to choose areas in the UK where individual from their home country resides.

[20] Kim and Yang (2009) adopt the panel VAR model in order to account for dymainc effects. The effects of the capital inflows are expected to be inhernetly dynamic. For example, forign capital inflows may affect different types of asset marlkkts with differetn timings. In such cases, VAR models are useful.

appreciation pressure by implementing sterilisation measures, encouraging outward FDI and tightening credit growth with increases in the lending rate and required reserves.

Gholipour (2013) investigates the effects of FDIRE on house prices in 21 emerging economies from 2000 to 2008 using a panel VAR model. The study examines the effect of FDIRE, GDP, interest rate and construction costs on the house prices of these 21 countries. The impulse response analysis results indicate that a shock to FDIRE leads to an increase in house prices in emerging economies. In particular, it identifies a positive effect of the FREI shock on house prices in emerging economies, where it increases house prices by 0.36% in two years.

In another study of Asian emerging market economies, Tillmann (2013) also addresses the response of property prices to an inflow in foreign capital. The paper adopts a panel VAR on quarterly data from 2001 to 2011 for emerging economies for which waves of inflow were particularly pronounced. The study finds that capital inflow shocks positively and significantly affect the increase of house and equity prices. By taking inflation into account and using quarterly data of actual foreign investment, housing prices and land prices, Bo and Bo (2007) examine the relationship between housing prices and foreign investment using a time series error correction model (ECM) and Granger causal test. Using investment by foreign enterprises as a proxy for foreign investment and house sale price as a measure for housing price, the results indicate that foreign capital inflow has helped increase housing prices in China. They conclude the need for the government to impose effective restrictions on foreign capital inflow into the real estate market.

Adopting a different perspective, Guo and Huang (2009) explore the extent of ‘hot money’ or speculative capital inflow on fluctuations in China’s real estate and stock markets. The study uses the change in foreign exchange reserves minus trade and service balance minus FDI as a proxy for hot money inflow and measures house price (HP) as the national average selling price of commodity buildings per square meter. They adopted a multivariate VAR estimation and Granger causality test and found that hot money has a positive effect on housing prices in China.

Similar to Guo and Huang (2009), Feng et al. (2017) analyse the effect of short-term capital flows, otherwise regarded as hot money, on China's residential property and stock prices. The study uses monthly time-series data from June 1997 to June 2013 and adopts a VAR model, which entailed examining the effect of the real-world interest rate, domestic interest rate, FDI and hot money net inflow on house and stock prices. The results of the impulse response analysis indicate that FDI and hot money inflow have a positive effect on house prices but not

on stock prices. The findings also suggest that the initial impact of FDI net inflow on house prices is negative. However, the effect becomes positive and reaches a maximum after one month, and a 10% rise in FDI net inflow resulted in a 2.5% increase in local house prices. By taking inflation into account and using quarterly data of actual foreign investment, housing prices and land prices, Bo and Bo (2007) examine the relationship between housing prices and foreign investment using a time series error correction model (ECM) and Granger causal test. Using investment by foreign enterprises as a proxy for foreign investment and house sale price as a measure of housing price, the results indicate that foreign capital inflow has helped increase housing prices in China. They conclude the need for the government to impose effective restrictions on foreign capital inflow into the real estate market

Wen (2021) investigates the effect of FDI on China's housing prices by adopting an OLS estimation method and national data from 2010 to 2019. The study examines how FDI and house supply proxied by area sales of commercial houses influence house prices. The results indicate that, for every 1 unit increase in FDI, house prices increase by 0.26. Wang et al. (2007) applied monthly data and a cointegration vector error correction and Granger causality estimation method. The results show that there is a long equilibrium between real estate price appreciation and foreign money inflow. Kuang et al. (2011) investigated the effect of FDI on house prices in 31 large and medium cities. Using a system GMM model on data from 1996 to 2007, the study finds that FDI has a positive and statistically significant effect on house prices and that construction costs, urban population and disposable income also have a positive and significant effect, while the interest rate has a negative and significant effect.

In contrast to these studies that show a positive effect of FDI on house prices, Huang et al. (2014) investigate whether real estate FDI significantly affects real estate prices in China. The study adopts an autoregressive distributed lag (ARDL) approach to the cointegration of data on Shanghai from 2001 to 2010. The main finding indicates that real estate FDI does not significantly affect real estate prices, either residential or commercial, in the short term and only affects Shanghai's office prices in the long term. The study concludes that real estate FDI is blamed for increased real estate prices, while in reality, factors such as government policies are the cause.

Using a more disaggregated dataset and primarily focusing on 21 Guangdong cities from 2001 to 2009, Choy et al. (2015) adopt a fixed-effects estimation to investigate property prices. The study measures house prices as the price of private residential properties per square meter and

the amount of investment made by a foreign enterprise as a proxy for FDI. It also examines the effect of construction cost, population, mortgage interest rate and housing speculation on housing prices. They find that FDI has a positive and significant effect on housing prices, but the magnitude of the coefficient is small. The study concludes that increasing FDI inflow in Guangdong cities accelerates demand for residential properties by developing their economies. However, its influence on real estate prices is modest. Lin (2007) uses time-series data of GDP, FDI and real estate prices in China from 1998 to 2005, together with an error correction model. The study finds that although GDP, FDI and property prices exhibit a cointegration relationship, the FDI inflow only has a minor effect. Qui and Wang (2009) use annual data on FDI and real estate prices from 1987 to 2007 and find that FDI and real estate exhibit a cointegration relationship but not a Granger causality relationship with each other.

In a different approach that primarily focused on cities with the highest property price increase, Wan and Chen (2006) studied Shanghai and employed a cointegration estimation to find that real estate foreign investment and real estate growth have a long-term equilibrium. However, using a Granger causality result, no evidence was found to support that foreign real estate investment is the direct reason for the growth of the real estate market in Shanghai. Sa et al. (2014) and Gholipour et al. (2014) observe selected OECD countries to examine the interrelationship between FDIRE, economic growth and property prices while controlling for interest rates and inflation. The dynamic interrelationship is analysed by applying a panel cointegration estimation on data from 1995 to 2008. However, unlike Sa et al., Gholipour et al. indicate that FDIRE does not affect the appreciation of housing prices and does not contribute to economic growth in the short- or long-run.

Many studies have examined the causal link between FDI and property prices from the perspectives of both developed and emerging economies using a number of methodologies and investigating different periods. Although many find a positive relationship between foreign investment and real estate prices, some find a negative relationship and provide evidence of an insignificant effect of foreign investment on property prices. This chapter aims to examine these two phenomena and clarify foreign investment's effect on housing prices. Given the demand-driven mechanism, property demand-driven mechanism and liquidity-based mechanism, the following hypothesis is proposed:

H1: FDI has a positive and significant effect on housing prices in China.

Additionally, it is important to note that this empirical chapter narrows its investigation of the real estate market and looks explicitly into China's housing prices. Similar to Kuang et al. (2011) and Wen (2021), I adopt the average selling price of residential property as the measure for house prices. The reason for considering housing prices instead of real estate prices is that housing is both a consumer and investment good in China (Ding, 2018). As such, the dependent variable in the estimation is the average regional house price in China.

The represented measure of foreign investment is IFDI, with direct investment from foreign firms into production or business in the domestic market being considered. FDI's role through international speculators in the housing market is significant. Aside from taking a different approach to the existing literature by considering FDI on a broader scale, inward FDI in the real estate sector is not used in this analysis because it narrows the focus to how a specific type of foreign investment affects the housing market. Therefore, FDI will be adopted as a primary independent variable in this chapter.

5.3.1.2 Demand and Supply Effects on House Prices.

Aside from FDI, other studies have explored the supply- and demand-side determinants of housing prices (Wang et al., 2017; Apergis and Rezitis, 2003; Mallick and Mahalik, 2015; Zhang et al., 2012; Zhang et al., 2015; Lui and Ma, 2021). Apergis and Rezitis (2003) analyse the dynamic effect of certain macroeconomic variables, namely housing mortgage rate, inflation, employment and money supply, on the price of new houses sold in Greece. By employing an error correction vector autoregressive (ECVAR) model, the results obtained from the impulse response function indicate that a shock to the money supply increases housing prices, which reached a maximum level after four quarters. They also indicate that a shock in the housing mortgage rate decreased house prices, while a shock in consumer prices and employment increased prices. Finally, variance decompositions show that the housing mortgage rate is the variable with the highest explanatory power, followed by consumer prices and employment.

Paz (2003) studies the real estate market in Spain by examining whether prices depend on market factors such as vacancy level, land availability, economic growth, construction costs, and urban areas' industrial and service activities. To achieve this, it adopts a generalised least square (GLS) method on 71 Spanish cities from 1987 to 1999 and finds that demand factors such as economic growth have a positive and significant effect on house prices. Using quarterly data from 15 major cities in India from Q1 2010 to Q4 2013 and a panel fixed effect regression, Mallick

and Mahalik (2014) investigate the factors determining regional housing prices in India. The study finds that the share price index, non-food banks, and FDI positively explain housing price appreciation. Inflation has a negative effect, and the price of gold, real effective exchange rate, and net portfolio investment shows no evidence of a significant impact.

Zietz (2007) adopts a quantile regression on data consisting of 13,660 home sales from mid-1999 to mid-2000 in Utah to examine the effect of housing characteristics such as the number of bathrooms, type of bathrooms, highway distance, and ecological factors on house prices. This approach was used to identify the coefficient of a large set of diverse variables across different quantiles. The findings indicate that buyers of higher-priced homes value specific housing characteristics such as square footage and the number of bathrooms differently from purchasers of lower-priced homes.

Similar to Zietz et al. (2007), Mak and Choy (2009) adopt a quantile regression model to examine 10,642 residential properties and investigate the effect of accessibility, neighbourhood characteristics, and environmental quality (waterfront or natural beauty) on house prices. The study finds evidence that home buyers' tastes and preferences for specific housing factors vary significantly across different quantiles of the conditional distribution. Using panel data from 35 major cities in China from 2002 to 2012, Zhu et al. (2018) studied the effect of income, economic openness, and interest rates on housing prices in China using a panel quantile technique. The results indicate that the impact of explanatory variables on different levels of housing price is heterogeneous across quantiles. The effect of income is positive and statistically significant across quantiles, and the impact is greater at the 90^{th} and 95^{th} quantiles. The study also finds that economic openness has a positive and significant influence at the 5^{th} – 60^{th} percentiles.

Wang et al. (2017) analysed the direction and effect of the relationship between housing prices and determinants in China from a tripartite perspective that accounts for housing demand, housing supply and the housing market. The data is made up of country-level housing prices and selected variables for 2014, and spatial regression and a geographical detector model were estimated. The study finds that factors such as population, wage level and cost of land have a positive effect on housing prices and that cost of land has a more significant influence on housing prices than any other factor. Furthermore, they emphasise potential regional differences in housing prices where provinces in the eastern coastal regions are found to have higher property prices than China's central and western regions. Zhang et al. (2017) investigate the ripple effect of house prices between 35 cities in China using a coefficient heterogeneity model with panel

data and a VAR model. The empirical results show evidence of regional inequality in house prices. The authors conclude that most regions are generally consistent with the national average; however, the northern and eastern areas display significantly larger house prices.

In an extensive study of 33 determinists of China's house prices, Lui and Ma (2021) use annual data from 31 provinces from 2000 to 2018 to examine the determinant of Chinese house prices with a panel data regression model. The study adopts a panel correlated standard errors regression model and finds that the variables with the most significance that drive up house prices are land price, loans of real estate developers, disposable income and the proportion of people with college or above education. Those such as the number of unemployed people have a significant negative effect. The results indicate that variables such as inflation, interest rate, per capita gross domestic product and rent cost have no effect.

Using annual data from 29 provinces from 1998 to 2009, Li and Chand (2013) focused on the aggregate residential housing market in urban China to identify the most important factors in determining house prices in each of the provinces. The paper adopts a panel fixed effect and finds that disposable income, construction cost and the dummy variable for land transferring reform in 2004 have a positive and significant effect on housing prices. The paper concludes that the different provinces belong to different house price groups. Beijing, Tianjin, Shanghai, Jiangsu, Zhejiang, Fujian, Sichuan and Guangdong have the highest housing prices. The middle-level group covers Heilongjiang, Hebei, Shandong, Henan, Shaanxi, Hubei, Anhui, Guizhou, Yunnan, Guangxi and Hainan. Jilin, Ningxia, Inner Mongolia, Gansu, Xijiang, Hunan and Jiangxi have lower housing prices. Qinghai province has the lowest. They conclude that housing prices are likely to be associated with the local economic status of the province. In line with this, Liang and Goa's (2007) investigation of the 29 provinces finds that regions with higher GDP per capita and better macroeconomic conditions have higher prices than the provinces that do not. Based on the literature and the availability of data, and in addition to regional IFDI, this chapter will use the following regional-level variables in building the model to explain regional house prices in China: (i) income, (ii) house supply, (iii) human capital, (iv) land cost and (v) pollution. Next, I provide an overview of the discussions relating each of these variables to house prices.

Income

China's housing market has experienced significant growth in recent years, and understanding the relationship between income and house prices is paramount. Studies such as Ahuja et al. (2010), Hua et al. (2012), and Zhang et al. (2012) indicate household disposable income pushes housing prices to a large extent. A vast demand for residential housing was unleashed by the housing reform in 1998, which can be partly justified by increasing household income or disposable income due to 30 years of rapid economic growth and a high household savings rate in China. Concurrently, income inequality in China has risen substantially across regions and within provinces in the past decades. As a result of income inequality, some households end up with higher disposable income and hence may afford to buy houses and apartments in big cities much more easily than others.

Li and Fan (2020) explored the impact of income disparity on housing affordability in 151 counties in China. Their findings revealed that rising income inequality has increased housing prices, particularly in counties in major cities. Higher-income individuals, with their increased purchasing power, drive up demand for housing, resulting in escalating prices and decreased affordability for lower-income groups. Fu and Gabriel (2012) focus on urbanisation and house price dynamics. Using data from China ‘s Urban Household Population Survey, the paper examines the effect of income inequality on urbanisation and vacancy rates in major Chinese cities from 2002 to 2006. The study finds a strong positive correlation between urbanisation and house prices, suggesting that rapid urbanisation has significantly influenced the rise in housing prices. The influx of people into first-tier cities like Shanghai and Beijing, driven by employment opportunities and economic growth, has increased demand for housing, thus pushing prices higher. Yin and Su (2022) examined the impact of housing market speculation on the relationship between income and house prices in China. They found that speculative behaviour in the housing market amplifies the effect of income on house prices, leading to increased volatility. In addition, speculative activities driven by high-income individuals can inflate house prices, further exacerbating the affordability challenge of the general population. The literature review highlights the complex relationship between income and house prices in China. Understanding these dynamics is crucial for policymakers to develop effective strategies that promote housing affordability and stability in China's housing market. Based on the existing literature, income increases the housing demand because of the rise in affordability. As such, I propose the following hypothesis:

H2: Income has a positive and statistically significant impact on house prices.

House Supply and Land Cost

Kim and Yang (2011) and Hilber and Vermeulen (2010) indicate that with increasing demand, a limited supply of residential properties can lead to a significant increase in house prices. Research by Li et al. (2022) explores the impact of housing market regulation on housing supply in China. Their findings indicated that regulatory measures, such as purchase restrictions and tightening of financing channels, affect the supply of housing units. These regulations can constrain supply and contribute to increased house prices in certain markets. Liu and Ou (2022) investigated the relationship between developer behaviour and housing supply in China. They found that developer speculation and market expectations influence housing supply decisions. Developers tend to increase supply during periods of high house prices, aiming to capitalize on market demand. Conversely, during periods of price declines, developers may reduce supply to avoid potential losses. Liu and Ou (2020) investigated the impact of government policies on housing supply and prices in China. Their findings revealed that government interventions, such as land use regulations and housing market control measures, directly influence the housing supply. The effectiveness of these policies in increasing or constraining the housing supply has a subsequent impact on house prices. Chen et al. (2018) examined the impact of regional disparities on house price variations in China. Their study found that variations in housing supply across regions contribute to differences in house prices. Areas with limited housing supply experience higher prices due to increased competition, while regions with sufficient supply tend to have more stable and affordable prices.

Land price is an essential factor that contributes to house prices. In China, the government is the sole land supplier controlling the quantity, timing, and structure of land supply (Zhang et al., 2013), and it is an important source of revenue for the local government (40% of local government revenue is from land sales) (Ahuja et al., 2010). Thus, the local government supports the housing industry and encourages SOE, private companies, and foreign multinationals to bid for land and lease properties (Liu et al., 2021), leading to an increase in house prices. Wang (2018) explored the relationship between urbanization and land prices in China. Their findings indicated that rapid urbanization drives up land prices, subsequently impacting house prices. Due to population growth and economic development, the increasing demand for land in urban areas leads to higher land costs, which are passed on to homebuyers through higher house prices. A study by Yuan et al. (2023) investigated the influence of

government policies on land costs and house prices in China. Their research highlighted that government interventions, such as land use regulations and restrictions, directly affect land supply and land costs. Policies that constrain land supply can lead to higher land prices, which impact housing affordability and contribute to higher house prices. It can be observed from the literature that an increase in land cost results in an increase in house prices. Additionally, restrictions in house supply would increase demand, thereby pushing house prices upward. Therefore, I propose the following hypothesis:

H3: Land Cost has a positive and statistically significant impact on house prices.

H4: House Supply has a negative and statistically significant impact on house prices.

Human Capital

A study by Liu et al. (2022) investigated the influence of education on house prices in China. Their research indicated that areas with higher educational attainment levels tend to have higher house prices. Education serves as an indicator of human capital and is associated with higher income levels and greater demand for housing, leading to increased prices. Liu et al. (2022) also highlight that cities like Shanghai, with high education levels, are synonymous with high levels of urbanisation and high prices. Studies like Yang and Pan (2020) explored the relationship between skill composition and house prices in China. Their findings revealed that regions with a higher proportion of skilled workers experience higher house prices. Skilled workers typically have higher incomes, increasing their purchasing power and willingness to invest in housing, thereby contributing to price appreciation. Wang et al. (2017) examined the impact of migration on house price dynamics in China. Their research highlighted that human capital inflows resulting from migration can lead to increased demand for housing, driving up prices. First Tier cities attracting a skilled workforce through migration experience higher house prices due to the positive impact of human capital on local economic development (Ding and Qin, 2017). Li and Wu (2014) investigated the impact of entrepreneurship on house prices in China. Their research found that areas with a higher entrepreneurial activity rate tend to have higher house prices. Entrepreneurs contribute to economic growth and job creation, attracting human capital and increasing demand for housing, thus influencing prices. Based on the literature, it can be stated that an increase in human capital is closely tied to economic productivity and job opportunities. Cities and regions with a concentration of highly skilled workers attract more industries, businesses and job creation. As such skilled workers migrate to these regions, increasing

housing demand in these areas and resulting in higher house prices due to the competition for limited housing supply. I, therefore, propose the following hypothesis:

H5: Human Capital has a positive and statistically significant impact on house prices.

Unemployment

A study by He et al. (2017) examined the relationship between unemployment and house prices in China. Their research indicated that higher unemployment rates negatively affect house prices. During periods of economic downturn or increased unemployment, individuals' reduced purchasing power and financial insecurity contribute to decreased housing demand and, subsequently, lower house prices. Hu (2022) investigated the influence of government policies on unemployment and house prices in China. Their research highlighted that government interventions, such as employment policies and stimulus measures, can impact unemployment rates, which subsequently affect house prices. Policies aimed at reducing unemployment and promoting economic stability can positively influence housing demand and, in turn, house prices. Leung et al. (2006) investigated the impact of consumer confidence and unemployment on house prices in China. Their research revealed that higher consumer confidence, driven by low unemployment rates and a positive economic outlook, leads to increased housing demand and higher house prices. Consumer confidence acts as a psychological factor that influences purchasing decisions, including homebuying, and thereby affects house prices. Based on the literature, it can be stated that high unemployment rates often lead to decreased purchasing power and financial instability among individuals. This, in turn, reduces the demand for housing as unemployed individuals are less likely to have the resources to purchase homes or invest in the housing market. The decline in housing demand can put downward pressure on house prices. As such, I propose the following hypothesis:

H6: Unemployment has a negative and statistically significant impact on house prices.

Pollution

The significance of comprehending the factors that affect the housing market has led researchers to explore aspects such as the role of environmental factors. Given the increased importance of environmental policies, studies analysing the causal effect of air pollution on health and economic outcomes have identified high costs of air pollution. Air pollution also affects the attractiveness of a location as residents are in danger of HAP-related diseases. Therefore, individuals are more likely to hold a preference for clean air (Sanders et al., 2011).

Amini et al. (2021) and Chen et al. (2017) conclude that air pollution affects migration decisions, thus affecting the housing market. Amini et al. (2021) investigate the effect of air pollution on Iran's housing market by exploiting increases in air pollution due to policies that targeted gasoline imports. Using administrative data on Tehran's housing market, nitrogen dioxide as a proxy for air pollution and adopting a fixed effect estimation, the study finds that a 10% increase in the outdoor concentration of nitrogen dioxide results in a decrease in housing prices of 0.8%, thus indicating the possible contraction of the housing market due to air pollution.

Tang and Neimeier (2021) investigate the effects of localised air pollution, namely black carbon, nitric oxide and nitrogen dioxide, on Oakland, California's housing prices. By combining a spatial lag model with an instrumental variable method, the study's results differ from those of Amini et al. (2021) as it finds a positive relationship between air pollution and housing prices. In relation to China, Lui et al. (2020) employ a regression disunity design to estimate the impact of air pollution on house pieces across a river that divides regions with and without coal-fired heating resulting from the Huai River Policy[21]. By adopting a panel consisting of 30 cities on either side of the river from 2006 to 2015, the study finds that a $\mu g/m^3$ (micrograms per cubic metre) reduction in average PM_{10}[22] is related to a 1% increase in house prices.

China is an interesting case for serval reasons. Aside from being the most prominent emerging economy, China's air quality is notoriously poor, and efforts at abating pollution are on the rise. Additionally, the government prioritised combating pollution in 2014, announcing a national emission trading scheme using market forces to reduce greenhouse gas emissions (Jotzo et al., 2018; Lui et al., 2020). Based on the literature, I propose the following hypothesis:

H7: Pollution has a negative and statistically significant impact on house prices.

[21] The Huai River Policy was decreed by the Chinese3 government in the 1950s and mandated the burning of coal for indoor heating at subsidized prices north of the Huai River (Lui et al., 2021).

[22] PM_{10} stands for particulate matter which is a complex mixture of extremely small particles and liquids droplets (Lui et al., 2021).

5.3 Methodology

5.3.2 Data

5.3.2.1 Data and Estimation

The study uses secondary regional-level data obtained from the Chinese National Bureau of Statistics. The sample contains annual data from 31 of China's provinces, and the sample period of house price, FDI, income, house supply, unemployment, and land cost is from 2006 to 2019. However, due to limitations of regional data for pollution, the sample of this particular variable is from 2011 to 2019.

Table 5.1 Variable Description

	Variable	Measure
Dependent Variable	**House Price**	The average selling price of villas, high-grade apartments (Yuan/sq.m) + selling price of commercialised residential properties (Yuan/sqm)
Independent Variables	IFDI	Total investment of foreign-funded enterprise (100 million Yuan)
	Income	Per capita disposable income (Yuan)
	HS (House Supply)	Floor space completed by construction enterprise (10,000 sq.m)
	(HC) Human Capital	Number of higher degree graduates (per 10,000 persons)
	Land Cost	Value of land purchased for real estate development (100 million yuan)
	Unemploy (Unemployment)	Registered unemployed Persons in Urban Areas (100000 persons)
	Pollution	Nitrogen Oxides Emission in Waste Gas (10, 000 tons)

Note: HS, HC and Unemploy represent House Supply, Human Capital and Unemployment. The dependent variable is highlighted.

Table 5.2 Descriptive Statistics

Variables	Mean	S.D	Min	Max	Obs.
House Price	8136.89	6501.41	1870.796	48464.51	420
FDI	912291.3	1577058	15903.36	13500000	420
Income	20677.73	9427.616	8871	69442	420
HS (House Supply)	11606.59	2640.84	173.97	479.39	420
HC (Human Capital)	20.46	13.11	59.34	0.86	420
Unemployment	25.27	13.64	2.9	60.7	420
Land Cost	529.61	783.20	1.56	5880.44	420
Pollution	62.38	40.56	4.87	180.11	270

Note: HS, HC and Unemploy represent House Supply, Human Capital and Unemployment. The dependent variable is highlighted.

Table 5.2 presents the descriptive statistics for the entire sample, and Appendix C displays the sample's descriptive statistics by region. It shows that the provinces display very distinct house prices and socio-economic conditions. Based on the house prices, coastal provinces such as Shanghai, Beijing, Hainan, Guangdong, Liaoning, Fujian, Tianjin, and Zhejiang have relatively higher prices than provinces such as Anhui, Gansu, and Yunnan. Additionally, special economic zones such as Guangdong, Fujian, Shanghai, Zhejiang, Shandong, and Liaoning with IFDI incentive schemes display a high degree of IFDI and concurrently exhibit high house prices. It is also important to note that special economic zones and coastal provinces such as Hebei, Xinjiang and Jiangxi display high levels of IFDI inflow. However, these provinces have relatively lower house prices than their counterparts. This could be based on several reasons. (i) other macroeconomic factors have a more dominant role on house prices, and (ii) as some of the studies discuss, IFDI, particularly real estate-specific FDI, could result in an increase in the supply of housing and thus put downward pressure on prices.

Figures 5.6 to 5.10 shows the evolution of house prices in terms of prices and quantiles for xx regions considered in this study. Different figures for five groups of provinces are provided for more visual clarity of the diagrams. Each group consists of six provinces. A couple of observations can be made based on these figures. (i) Generally, house prices show an upward

tendency over the sample period. (ii) The minimum value of house prices in some provinces, such as Beijing and Shanghai, in my data sample were in the 60th percentile of house prices and have moved to even higher percentiles over time. However, house prices in a number of provinces in my sample started at a much lower percentile and are closing the gap with prices in provinces such as Beijing and Shanghai. One example is Chongquing in Figure 5.6, which had house prices in the 10th percentile at the start of the sample, and by the end of it, house prices were close to the 70th percentile.

Figure 5.6 House Price per Quantile

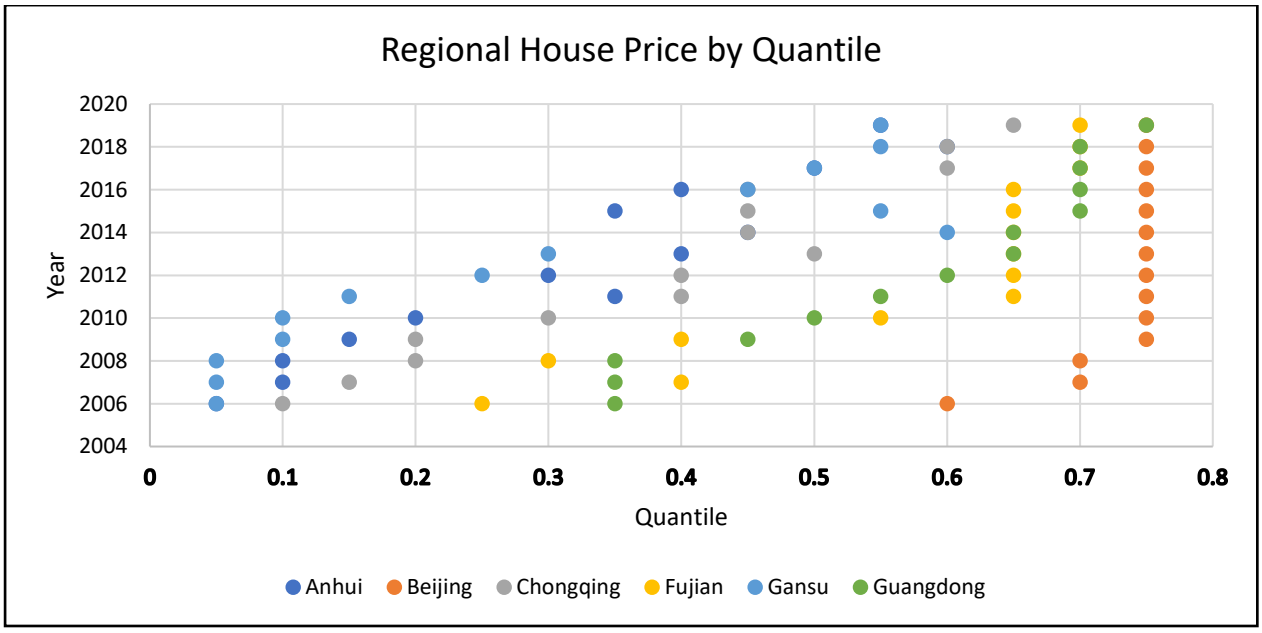


Figure 5.7 House Price per Quantile

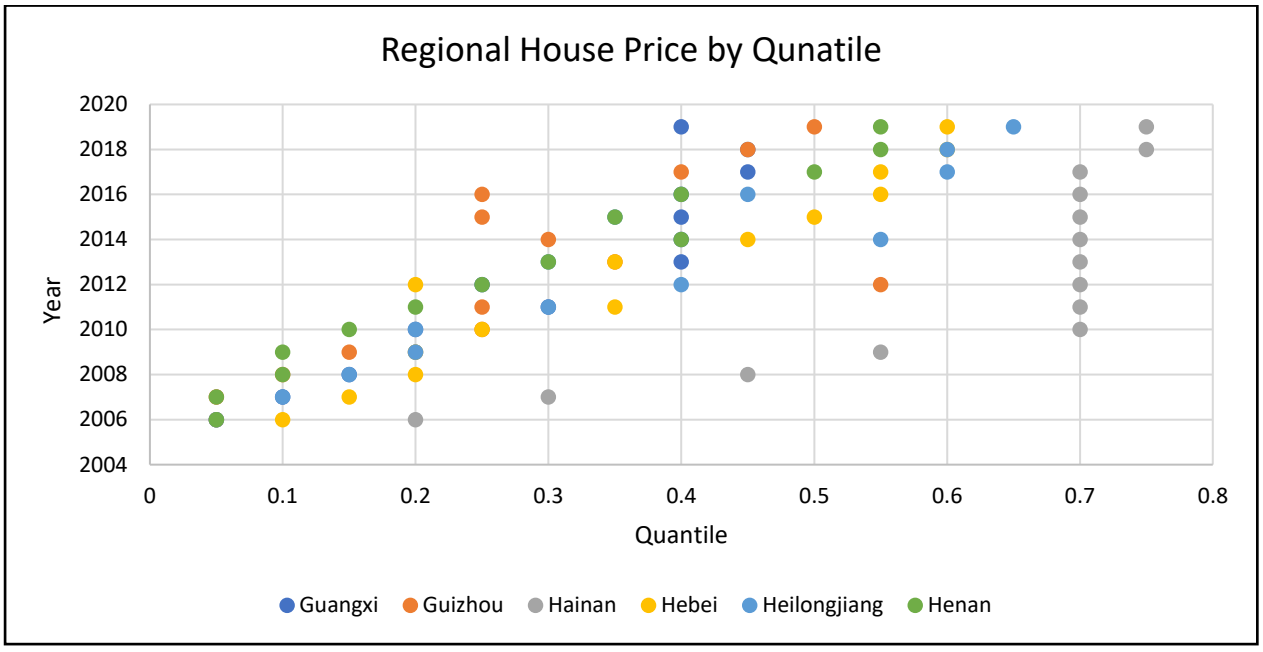


Figure 5.8 House Price per Quantile

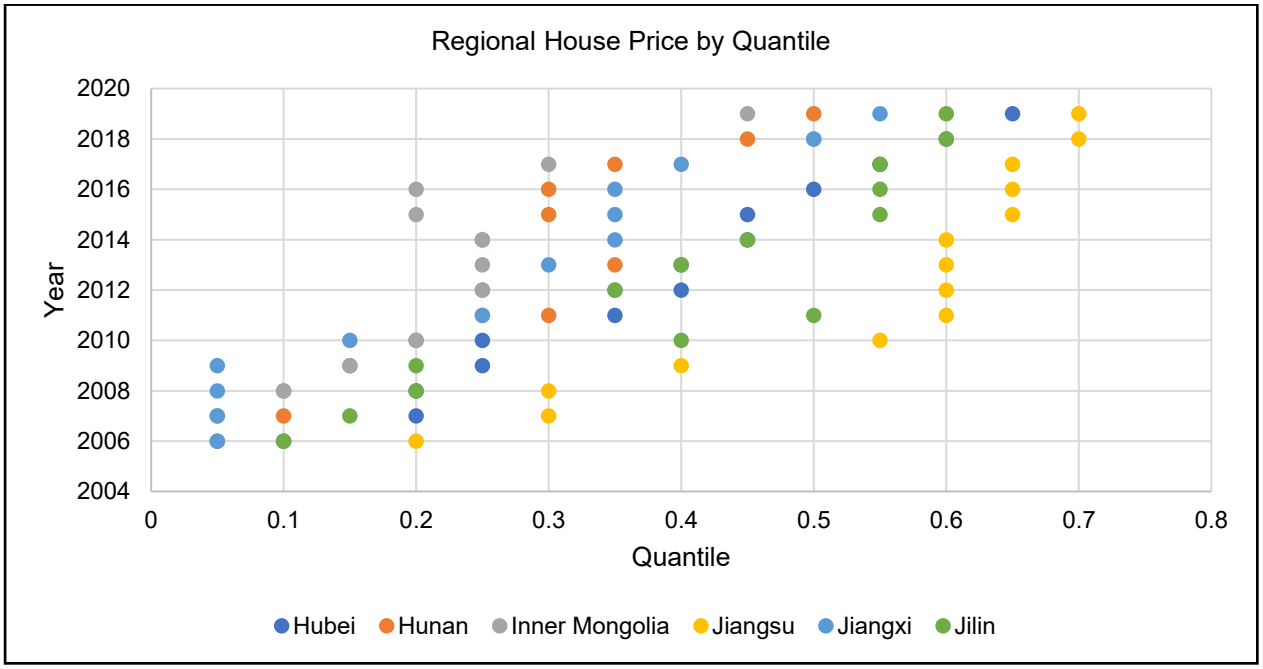


Figure 5.9 House price per Quantile

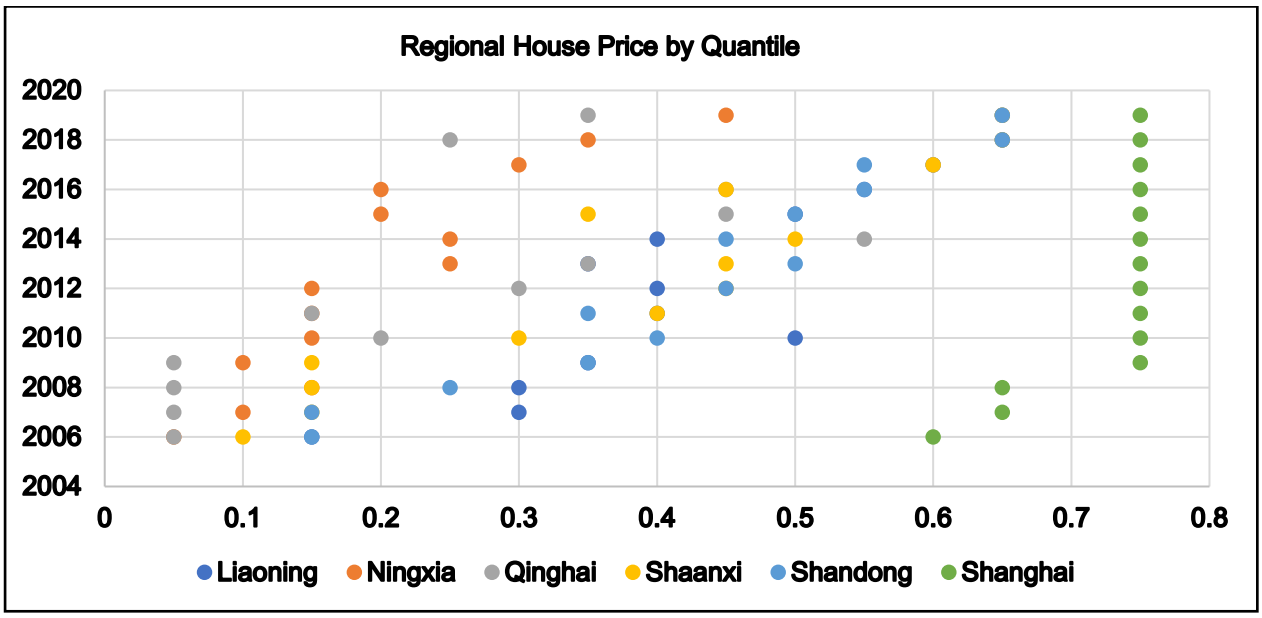
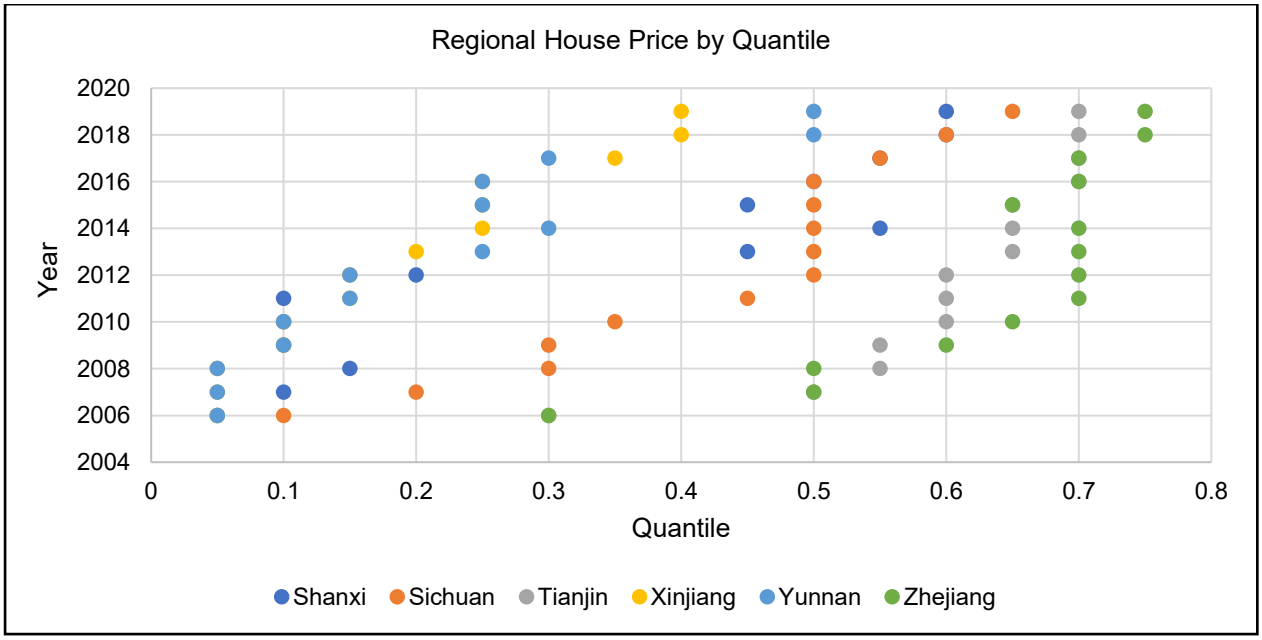


Figure 5.10 House price per Quantile



Following the discussions in the literature review section, the model for explaining house prices is defined as follows:

$$HP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 Income_{it} + \beta_3\,(HS) House\ Supply_{it} + \beta_4\,(HC)\ Human\ Capital_{it} + \beta_5 (Unemploy)\ Unemployment_{it} + \beta_6 LandCost_{it} + a_i + v_{it} \quad (5.1)$$

$$HP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 Income_{it} + \beta_3\,(HS) House\ Supply_{it} + \beta_4\,(HC) Human\ Capital_{it} + \beta_5 (Unemploy) Unemployment_{it} + \beta_6 LandCost_{it} + \beta_7 Pollution_{it} + a_i + v_{it} \quad (5.2)$$

Equation 5.2 is slightly different to 5.1 in that it contains an additional variable – pollution. The reason for specifying two equations is that the pollution data is available for a shorter period, from 2011 to 2019, than other variables that are available from 2006 to 2019. Therefore, to ensure the robustness of the findings, Equation 5.1 is also estimated in addition to 5.2. Both equations adopt the fixed effects estimation. The contracted form of Equations 1 and 2 could be presented in a general fixed effect form, portrayed in Arellano and Bonhomme (2011) and Conay (2011) as follows:

$$\mathrm{Y_{it}} = X'_{it}\beta(U_{it}) + \alpha_{\mathrm{i}} + \sigma \mathrm{v_{it}} \quad (5.3)$$

where $\mathbf{Y_{it}}$ is regional house prices in China defined as the dependent variable. $\boldsymbol{X'_{it}}$ is all the explanatory variables presented above, which appear in the specification as a vector regressors. Additionally, $\boldsymbol{X_{it}}$ includes a constant term. Here, t = 1,…,T and i = 1,…,n. (are, respectively, time period and individual (provinces) indexes. $\mathbf{v_{it}}$ is the overall error term that varies over time and provinces (i) and $\boldsymbol{\alpha_i}$ represents the error term that varies over provinces (i).

Given the regional price disparity in China's housing market, I aim to investigate how foreign direct investment affects provinces in China with distinct house prices. To achieve this, I adopt a novel approach to that of Guest and Rhode (2017) and Li and Chand (2013), which combines quantile with panel data. Quantile regression is appropriate when the variable of interest has varying effects at different points of the conditional distribution of the outcome variables, in this case, regional house prices (Boumparis et al., 2017). These heterogeneous effects have proven to provide useful information missed by mean regression estimations portrayed in Equations 5.1 and 5.2 (Bitler et al., 2006; Powell, 2016). It is also common in the literature to account for unobserved heterogeneity. With the increased use of both fixed effects and quantiles, a growing literature has combined quantiles with panel data (Boumparis et al., 2017). Numerous quantile

panel data estimators adopt an analogous method, including additive fixed effects. Given the econometric specification of a quantile regression with additive fixed effects:

$$\mathrm{Y_{it}} = X'_{it}\beta(U_{it}) + \alpha_{\mathrm{i}}\gamma(U_{it}) \quad (5.4)$$

Where $\boldsymbol{U_{it}}$ is the rank of the error $\mathbf{v_{it}}$ Thus, $\boldsymbol{U_{it}}|\, \boldsymbol{X_{i1}};\ \boldsymbol{X_{i2}}; \ldots\ldots; \boldsymbol{X_{iT}}.\boldsymbol{\alpha_{\mathrm{i}}} \sim \boldsymbol{U}(\mathbf{0},\mathbf{1}).\, \boldsymbol{\beta}(\boldsymbol{U})$ and $\boldsymbol{\gamma}(\boldsymbol{U})$ are non-parametric functions. $\boldsymbol{\alpha_{\mathrm{i}}}$ is the additive fixed-effects term, which refers to a possible existing gap $\mathbf{Y_{it}} - \boldsymbol{\alpha_{\mathrm{i}}}$. It is possible to have at the bottom of $\mathbf{Y_{it}}$ distribution of some observations with a big difference, $\mathbf{Y_{it}} - \boldsymbol{\alpha_{\mathrm{i}}}$. Specifically, certain features or fixed effects of regional house prices could predominantly appear in specified subgroups of the price levels as triggers that cause a bias in the estimates (Boumparis, 2017; Kendo and Tchakounte, 2022). This will thus induce a bias in the analysis of the results.

An econometric solution to this specification is proposed by Graham et al. (2015) and Powell (2022). This solution entails incorporating non-additive fixed effects into the quantile panel estimation. To estimate the impact of FDI on the different levels of houses prices in China (from low to high), I adopt the quantile regression with non-additive fixed effects introduced by Powell (2022) and used in Boumparis et al. (2017), as well as Kendo and Tchakounte (2022). The main benefit of this method relative to the existing quantile estimators with additive fixed effects ($\boldsymbol{\alpha_{\mathrm{i}}}$) portrayed in Equation 5.4, is that it provides estimates of the distribution of $\mathbf{Y_{it}}$ given $\boldsymbol{X'_{it}}$ instead of $\mathbf{Y_{it}}$ - $\boldsymbol{\alpha_{\mathrm{i}}}$ given $\boldsymbol{X'_{it}}$. Powell (2022) points out that the application of additive fixed effects is undesirable, and this is because observations on ($\mathbf{Y_{it}}$ - $\boldsymbol{\alpha_{\mathrm{i}}}$) distribution may be at the bottom of the distribution, and therefore fixed additive effects cannot provide information about the impact of the explanatory variables on the outcome variable's distribution. Hence, Powell's (2022) approach offers estimates which can be interpreted in the same way as estimates from cross-sectional regression. Boumparis (2017) also indicates that this method allows an econometric model to be specified without clearly distinguishing a fixed coefficient illustrating individual effects. As a result, the quantile panel estimation with non-additive fixed effects assumes that individual effects are an essential; part of each explanatory variable. The inseparable component of the individual effects observed in each level (low to high) of the dependent variable could explain why there are potential differences in the impact of FDI on each level of regional house price in China. The econometric specification of quantile regression for panel data with non-additive fixed effects is defined as:

$$\mathbf{Y_{it}} = \boldsymbol{X'_{it}}\boldsymbol{\beta}(\boldsymbol{U^*_{it}}) \quad (5.5)$$

where $\mathbf{Y_{it}}$ is regional house price, $\boldsymbol{\beta}$ is the parameter of interest, $\boldsymbol{X_{it}}$ are the explanatory variables and $\boldsymbol{U^*_{it}}$ is the error term that may be a function of several disturbance terms, some fixed and sometimes varying (Boumparis et al., 2017). This indicates that $\boldsymbol{U^*_{it}}$ contains both $\mathbf{a_i}$ and $\boldsymbol{v_{it}}$. However, dissimilar to equations 5.3 and 5.4, the error term is not additive.

Based on the quantile regression for panel data with a non-additive fixed effects approach, our econometric model is detailed as follows:

$$HP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 Income_{it} + \beta_6\,(HS)House\ Supply_{it} + \beta_8(HC)Human\ Capital_{it} + \beta_7\,(Unemploy)Unemployment_{it} + \beta_9 LandCost_{it} + u_i \quad (5.6)$$

$$HP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 Income_{it} + \beta_3\,(HS)House\ Supply_{it} + \beta_4(HC)Human\ Capital_{it} + \beta_5(Unemploy)Unemployment_{it} + \beta_6 LandCost_{it} + \beta_7 Pollution_{it} + u_{it} \quad (5.7)$$

With this specification, there is a potential that most of the regressors could be dependent on house prices. To solve the endogeneity problem in panel data, studies such as Kim and Yang (2009) and Gholipour (2013) adopt a panel VAR model, while Guest and Rhodes (2017) implement a GMM estimation method. For our econometric approach, the panel quantile estimation specification allows the use of instrumental variables incorporated in the STATA command *qregpd* developed by Powell (2016). The generalised quantile regressions are estimated using Markov Chain Monte Carlo (MCMC) methods, which contain a sequence of draws from the posterior disturbance of the model's parameters (Arellano and Bonhomme, 2011). In my estimation, I first run *qregpd* that excludes instruments and then include instruments defined as one-year lag values of initial regressors. The *qregpd* is a unique case of a generalised quantile estimator. Our study differs from notable existing literature such as Sa et al. (2014), which adopts a panel VAR estimation method on data consisting of 18 developed OECD countries, and Guest and Rhodes (2017), who adopt a GMM estimation on data focusing on Australia. This chapter also differs from Zietz et al. (2007) and Mak and Choy (2009), who both adopt quantile estimations and a panel quantile estimation, respectively. In this chapter, I choose to deviate from these two lines of study by first adopting IFDI to study the impact. Secondly, N

on-additive fixed effects allow for the estimation of interactive effects between individual-specific time-invariant characteristics and time-varying covariates. This means that the relationship between these variables and the outcome variable can vary depending on individual-specific

factors. Also, by including non-additive fixed effects, there is more flexibility in modelling the relationship between individual-specific characteristics and the dependent variable, i.e. house prices. This is because it allows for the estimation of non-linear relationships, which may be important in some cases. Finally, non-additive fixed effects can help reduce omitted variable bias, as they can capture the impact of unobserved time-varying factors correlated with the covariates and the outcome variable. This chapter extends the existing literature by first adopting this novel estimation method and focusing on emerging economies, specifically China.

5.4 Results and Discussion

I begin the analysis by examining the impact of IFDI on China's house prices by first estimating Equations 5.1 and 5.2. This entails adopting a fixed-effects estimation for both models on the entire sample. In Table 5.3, I estimate the fixed effects model of the entire sample and its results with those obtained from applying the quantile regression with non-additive fixed effects. Column 1 of Table 5.3 shows the fixed effects results of the entire sample from 2006 to 2011. All the variables are presented in log form to ensure a clear interpretation of the results. The estimation in column 1 shows a positive link between inward FDI and house prices: a 1% increase in FDI leads to a 0.030% increase in house prices in China. This result is in line with Hypothesis 1 and studies such as Guest and Rhode (2017) and Sa et al. (2014). Apart from income and unemployment, which show insignificant results, all variables are statistically significant.

Like FDI, the effect of human capital and land cost on house prices is also positive and statistically significant, as a 1% increase in human capital and land cost results in a 0.260% and 0.131% increase in house prices, respectively. In line with existing literature, house supply is seen to have a negative and significant effect on house supply. A 1% increase in the housing supply leads to a 0.101% decrease in house prices. The results of land cost, house supply, and human capital are in line with Hypothesis 3, 4 and 5.

Column 2 shows the results of Equation 5.2, which accounts for the effects of pollution and incorporates the whole sample. However, as stated earlier, the sample is from 2011 to 2019 because of data limitations of the pollution variable. Like column 1, column 2 shows that inward FDI has a positive and significant effect on house prices. However, the effect is significant at a 1% significance level, unlike the 10% significance level in column 1. The results of column 2 also show land cost has a positive effect on house prices. However, compared to Model 1, some variables are not statistically significant.

Table 5.3 Fixed Effects Estimation

	(1) Fixed Effects	(2) Fixed Effects
Variables	**LogHouse Price**	**LogHouse Price**
LogIFDI	0.0309* (0.0234)	0.115*** (0.0381)
LogHS	-0.101***	-0.0330
	(0.0314)	(0.0384)
LogIncome	0.118	0.116
	(0.0562)	(0.0814)
LogHC	0.260***	-0.0421
	(0.0689)	(0.129)
LogUnemploy	-0.0198	-0.109
	(0.0677)	(0.0941)
LogLand Cost	0.131***	0.108***
	(0.0218)	(0.0254)
LogPollution		-0.163***
		(0.0525)
Constant	0.556	7.121***
	(0.299)	(1.004)
Obs	420	270
R-squared	0.841	0.584
Prob>chi2	0.000	0.000
Fixed Effects	Yes	Yes

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. In this table, the dependent variable is highlighted, and the independent variables (Log IFDI, Log HS, Log Income, Log HC, Log unemploy and log land cost). Note: House Supply, Human Capital and Unemployment are represented by HS, HC and Unemploy. The sample for the first estimation (Row 1) is from 2006 to 2019 and excludes pollution. The sample for the second estimation (Row 2) includes pollution and is from 2011 to 2019.

The findings show that a 1% increase in land cost indicates a 0.108% increase in house prices. As we include pollution in column 2, the result suggests that the effect of pollution on house prices on negative and statistically significant at a 1% significance level. The result shows that a 1% increase in pollution results in a 0.163% decrease in house prices in China.

5.4.1 Quantile Estimation Result, 2006 – 2019

Table 5.4 captures the varying effects of FDI and other independent variables on different quantiles of house prices in China by estimating a panel quantile regression with non-additive fixed effects for equation 5.6, which omits the variable pollution and covers the period 2006 to 2019 sample. To examine the sample distribution and understand the varying impact of the explanatory variables on house prices, we begin with 0.05 as the smallest quantile and the highest stated as 0.75. According to Kendo and Tchakounte (2021), these quantiles can highlight the effect of FDI on house prices according to the level of house prices.

Table 5.4 Panel Quantile Estimates 2006 – 2019

	Log House Price						
	Log IFDI	LogHouse Supply	LogIncome	LogHuman Capital	Log Unemploy	Log Land Cost	Obs
Quantile	Coef.	Coef.	Coef.	Coef.	Coef	Coef.	
0.05	0.107*** (0.013)	-0.0815*** (0.024)	0.935*** (0.108)	-0.0254 (0.024)	-0.0549 (0.035)	0.120*** (0.025)	420
0.10	0.00601 (0.0219)	-0.129*** (0.0363)	0.794*** (0.0301)	-0.129*** (0.0292)	0.0425 (0.0477)	0.209*** (0.030)	420
0.15	0.144*** (0.011)	-0.0738*** (0.002)	0.652*** (0.026)	-0.0113 (0.022)	-0.189*** (0.008)	0.150*** (0.004)	420
0.20	-0.04*** (0.012)	-0.0375 (0.029)	0.803*** (0.033)	-0.105*** (0.025)	0.0884 (0.072)	0.120*** (0.010)	420
0.25	0.115*** (0.012)	-0.0564*** (0.011)	0.653*** (0.065)	0.044*** (0.010)	-0.198*** (0.009)	0.137*** (0.011)	420
0.30	0.018*** (0.014)	-0.116*** (0.027)	0.796*** (0.019)	0.0243 (0.056)	-0.0571*** (0.035)	0.173*** (0.010)	420
0.35	0.065*** (0.0046)	-0.0738*** (0.00481)	0.898*** (0.00825)	0.092*** (0.006)	-0.158*** (0.00605)	0.0685*** (0.00193)	420
0.40	0.085*** (0.0051)	-0.146*** (0.00768)	0.846*** (0.0174)	0.145*** (0.0096)	-0.255*** (0.006)	0.143*** (0.008)	420
0.45	0.112*** (0.0068)	-0.150*** (0.00395)	0.789*** (0.0287)	0.219*** (0.0141)	-0.325*** (0.0113)	0.110*** (0.0135)	420

0.50	0.078***	-0.141***	0.861***	0.147***	-0.212***	0.106***	420
	(0.0038)	(0.0124)	(0.0185)	(0.0102)	(0.0218)	(0.00930)	
0.55	0.097***	-0.160***	0.903***	0.180***	-0.247***	0.0795***	420
	(0.0020)	(0.00424)	(0.0189)	(0.0071)	(0.00795)	(0.00541)	
0.60	0.117***	-0.159***	0.833***	0.156***	-0.255***	0.0816***	420
	(0.0030)	(0.00231)	(0.0186)	(0.0084)	(0.00740)	(0.00620)	
0.65	0.055***	-0.165***	0.790***	0.113***	-0.0807***	0.120***	420
	(0.0174)	(0.0165)	(0.0520)	(0.0379)	(0.0210)	(0.0116)	
0.70	0.052***	-0.140***	0.831***	0.0172	-0.0267***	0.101***	420
	(0.0123)	(0.00333)	(0.0489)	(0.0107)	(0.00799)	(0.0240)	
0.75	0.098***	-0.152***	1.025***	0.039***	-0.0614***	0.0319***	420
	(0.0054)	(0.0118)	(0.0138)	(0.0115)	(0.0111)	(0.00552)	

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. In this table, the dependent variable is highlighted, and independent variables (Log IFDI, Log HS, Log Income, Log HC, Log unemploy and log land cost) are placed on the columns underneath the highlighted dependent variable. Note: House Supply, Human Capital and Unemployment is represented by HS, HC and Unemploy. The sample for this panel estimation is from 2006 to 2019 and excludes pollution.

The following main conclusions can be drawn by looking at the results in Table 5.4 and comparing them to the standard fixed effects results for Model 1 in Table 5.3. (i) To a large extent, the results from quantile estimations are consistent with the standard fixed effects model in terms of statistical significance, magnitude and sign of coefficients. (ii) There are some variables for which the quantile estimations matter more than others and provide some interesting insights into the behaviour of some variables, particularly human capital and unemployment. In the standard, fixed effect estimations, Model 1, Table 5.3, human capital displays a positive and statistically significant relationship with house prices. With the quantile estimations, a positive and significant relationship can be observed at higher quantiles, but a negative and statistically significant relationship can also be observed in some of the lower quantiles. A possible explanation for the differences in the results of bottom and top quantiles is as follows. The houses in the bottom quantile are generally from poorer regions; therefore, as people become more educated (increase their human capital), they aspire to move to more affluent regions. Therefore, demand for housing in poorer regions drops, lowering house prices. Unemployment was not significant in the standard fixed effect estimation but is significant in many quantiles. In particular, as I move away from the lower quantiles, a statistically significant and negative relationship is observed. This result is in line with the explanation that demand for housing would be lower if unemployment increases and, therefore, house prices should fall. In the bottom quantiles, unemployment appears insignificant. An explanation could be that many

of the houses in the bottom quantile are in the poorer areas far away from urban and employment centres. There may not be many variations in employment, mainly formally recorded employment, and therefore houses are not sensitive to employment levels. The discussions here illustrate the benefit of employing quantile estimations rather than just focusing on the mean, as is the case generally.

I will now delve deeper into specific quantiles to discuss the results, and for that purpose, I will focus on the following quantiles: 5th, 25^{th,} to 75th. Starting with the 5th quantile, inward FDI has a positive and statistically significant effect on house prices. The results indicate that a 1% increase in FDI results in a 0.107% increase in house prices of the bottom 5% of the distribution. This result is similar to the fixed effects results in columns 1 and 2 in Table 5.3. Additionally, these results are in line with Hypothesis 1 – IFDI will have a positive effect on house prices. In Figures 5.6 to 5.10, I presented scatter plots showing the different periods and regions that belong to each quantile of the distribution. They show that the provinces and times that constitute the 5th quantile of the sample are Gansu 2006 – 2008, Henan 2006 – 2007, Jiangxi 2006 – 2009, Quanghai 2006 – 2009 and Yunnan 2007 – 2008. The time within this quantile is an early period in the sample from 2006 to 2009 across the provinces. This indicates that the above provinces in these specific periods had the lowest (5%) house prices in the sample. Also, all the above provinces with the exception of Jiangxi, are inland provinces and are characterised as poor provinces with the lowest income per capita and Human Capital (Yang, 2002). Additionally, migration from these areas to coastal areas is relatively higher. Lu and Xia (2016) indicate that it is due to major drivers such as the aspiration for higher income, better job opportunities and efficient services that encourage coastal and urban provinces. Therefore, reducing the demand for residential properties for investment and consumption in these areas during the aforementioned period.

It is also important to note that IFDI inflows in these regions in the 5th quantile are relatively lower than in the coastal areas as none inhabit special economic zones. Additionally, inland locations do not constitute strategic locations for FDI. However, given that foreign direct investment is stated in numerous studies to facilitate the economic development of both regions and countries, the positive impact of IFDI on house prices, as indicated in row 1 of Table 5.4, is expected. Another possible explanation for why IFDI impacts house prices in this 5th quantile region is that this may be due to spillover effects from neighbouring richer provinces. This affirms the demand-driven and liquidity-driven mechanisms that link IFDI and house prices.

The result of the 5th quantile also shows that income has a positive and statistically significant effect on house prices. Specifically, the result shows that a 1% increase in household income results in a 0.935% increase in house prices across the stated periods in those regions. These results affirm Hypothesis 2 and are in line with the existing literature, which indicates that an increase in household income increases the demand for houses as the capability of residents to afford residential property increases (Liang and Goa, 2007; Kim and Yang, 2011; Li and Chand, 2013).

I also find that the impact of house supply on house prices is negative and statistically significant. The results suggest that a 1% decrease in house supply results in a 0.081% increase in house prices. This result is in line with Hypothesis 4. It is also consistent with the existing literature, e.g. Kim and Yang (2011; Li et al., 2022; Chen et al., 2018 and Liu and Ou, 2022). The findings also indicate that human capital and unemployment have a negative relationship with house prices; however, these results are not statistically significant. The result for human capital is not in line with Hypothesis 5 and the literature. It is important to note that the negative findings for human capital are only for a few quantiles. Also, these results might be contrary to the existing literature because existing studies such as Lui and Ma (2021) and Wang et al. (2017) study the mean, while I explore quantiles.

With regards to unemployment, this result is also not in line with hypothesis 6 as it displays statistically insignificant findings. This can be possible because of the prevalence of self-sufficiency and subsistence entrepreneurship, e.g. farming in rural and poorer areas in China. In such cases, the local economy may rely less on formal employment and more on agricultural activities or small businesses. Consequently, unemployment rates may be insignificant or have a smaller effect on the overall economic stability and, subsequently, the housing market.

The result of the 5th quantile indicates that a 1% increase in land cost leads to a 0.120% increase in house prices. This result affirms Hypothesis 3 and is consistent with the literature e,g. Yuan et al. (2023) and Liu et al. (2021)

The estimations result of the 25th to 75th quantile shows that IFDI has a positive and statistically significant impact on house prices. Provinces with SEZs, such as Fujian 2006, appear in the 25th quantile, indicating that a 1% increase in IFDI will result in a 0.115% increase in house prices. Guangdong Province 2006 has the most SEZs and is in the 35th quantile and shows a 1% increase in IFDI, resulting in a 0.065% increase in house prices. This result confirms the existing literature, such as Wang (2007) indicates that house prices increase dramatically in provinces

with SEZs because of the FDI promotion incentives. This increase in IFDI encourages these provinces' economic development, facilitating infrastructure, knowledge and technology spillover. As a result, this demand for residential property increases, thus increasing the housing price (Kim and Yang, 2011).

According to Figures 5.6, 5.7 and 5.10, house prices of provinces with special economic zones, such as Fujian, appreciate an upward trend, specifically from 2006 in the 25th quantile to 2019 in the 70th quantile. House prices of provinces with SEZs, such as Fujian, show an upward trend from 2006 in the 25th quantile to 2019 in the 70th. House prices in Guangdong province increased from 2006, when it was in the 35th quantile, to 2019, in the 75th. Hainan province, which also contains SEZ, moved from the 20th quantile in 2006. However, unlike Guangdong, Hainan's house prices increased at a much faster rate as it reached the 75th quantile in 2010. In contrast to Fujian, Guangdong and Hainan, Xinjiang has maintained lower house prices than other SEZ provinces. This is likely because, according to Tables 5.4 and 5.10, Xinjiang has very low levels of FDI and income per capita compared to other provinces in the sample.

Aside from SEZ areas, the government has established open coastal cities to encourage FDI and stimulate economic growth by leveraging their coastal geographical location and economic opportunities (Chen, 2015). Like the SEZ areas, these open coastal cities have FDI promotion incentives to attract international capital, technology, and managerial expertise to ensure China's industrial development (Huang et al., 2014). They have gone through rapid urbanisation, and international and domestic migration to these areas has increased substantially over time (Pasquai and Marucci, 2021), thus increasing the demand for residential property and, subsequently, house prices. House prices of provinces with open coastal cities, such as Hebei, emerge in the 10th quantile of the sample for 2006 and increase to the 60th by 2018.

Liaoning and Shandong, also open coastal provinces, emerge in the 15th quantile and increase to the 65th quantile. Jiangsu 2006 appears in the 20th quantile and moves to the 70th, and Tianjin and Zhejiang 2006 emerge in the 30th quantile and move to the 70th and 75th, respectively. The provinces all record higher house prices than inland provinces, and simultaneously, like SEZ, they attract greater levels of foreign investment and income per capita. Also, according to Table 5.4, the results of the 65th and 70th quantile indicate that a 1% increase in FDI results in a 0.055% and 0.052% increase in house prices, respectively. Shanghai is one of the most urbanised provinces in China and has some of the highest house prices, with it emerging in the 60th quantile in 2006 and increasing to the 75th in 2009. The finding of the 60th and 75th

estimations indicated in Table 5.4 shows that a 1% increase in IFDI leads to a 0.117% and 0.098% increase in house prices, respectively.

Wei et al. (2006) indicate that foreign investment is a significant agent of the transformation and globalisation of Shanghai. Shanghai has undergone dramatic reforms and infrastructure towards establishing itself as a global investment location, and it is regarded as the financial capital of China (Yusuf and Wu, 2002). According to NBS China (2020), as of 2019, there were 92,922 foreign-funded enterprises in Shanghai. This increase in foreign investment and urbanisation is accompanied by increased demand for assets, thus significantly increasing the price of residential properties in Shanghai.

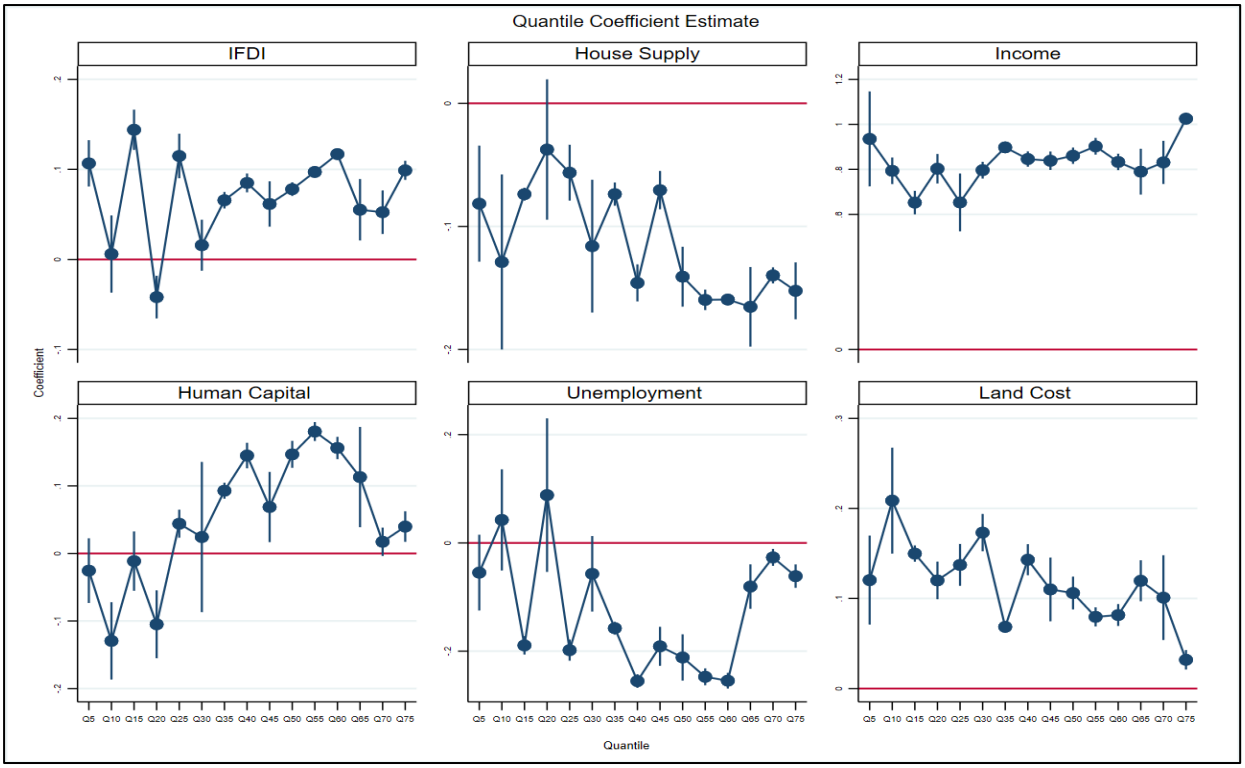
Like Shanghai, Beijing, China's capital city, emerged in the 60th quantile of house price distribution and increased to the 75th in 2009. Beijing is a highly urbanised province with 32,201 foreign-funded enterprises (NBS, 2020). Therefore, it accounts for a more significant foreign investment inflow and higher house prices relative to inland areas. The contribution of FDI, industrial transformation and economic development in these major provinces has aggravated the regional disparity in the housing market. In major provinces like Beijing, Shanghai and Guangdong, it is common for one house to cost millions of renminbi (Li et al., 2014). Because of the disparity in the housing market and surging prices, the government has implemented housing policies, including loan, sales purchase, and price restriction policies (Chunyi Bu, 2018). These regulations aimed at stabilising house prices by suppressing demand.

Figure 5.11 shows the coefficient estimates by quantile for the house price distribution of the sample. The Y-axis records the 5th to the 75th quantiles, while the Y-axis shows the coefficient for each quantile stated in Table 5.4. The red horizontal line represents the 95% confidence interval. It shows that the effect of FDI, house supply, income, human capital, unemployment and land cost varies across the distribution of house prices. Although there is an effect on all house prices, the magnitude varies across quantiles.

The magnitude of some of the IFDI coefficients increases while others decrease as the quantile increase from the 5th to the 75th. Furthermore, I find that in the lower quantile distribution of house prices that incorporate provinces and times that record low house prices, the coefficient's magnitude is significantly higher than those in the high quantile. Specifically, in the 5th, 15th, and 25th quantile estimations, the coefficients are 0.107 and 0.115, respectively. These values are relatively higher than those in the 65th, 70th and 75th quantile. I find these results interesting because the majority of the existing literature indicates that the magnitude of the impact of IFDI

on house prices is higher in locations that have higher economic development, urbanisation, infrastructure, job opportunities and FDI inflow (Kuang et al., 2011; Sa et al., 2014; Kim and Yang, 2009, Wen, 2021; Guo and Huang, 2009). By taking a different approach by adopting the quantile panel estimation with non-additive fixed effects, I find that IFDI has a more significant impact in provinces and early periods that occur in the lower percentile. These provinces and time constitute the early years of less-developed areas like Anhui and Gansu and more developed provinces like Guangdong.

Figure 5.11 Quantile Coefficient Estimate 2006 – 2019



A possible explanation could be that in these inland provinces and years, where house prices were the lowest in the sample, I expect the effect of IFDI to be relatively high compared to other parts of the house price distribution since average prices in these regions experienced a high growth due to the initial low level. These findings might also be due to the aggressive policies implemented in 2010 to curb house prices in China. The loan, price and sale restrictions were established between 2010 and 2018 and sought to reduce China's housing demand (Lu et al., 2021). Given that house prices from 2010 to 2019 in most of the average and high-price provinces are within the 50th to 75th quantiles, FDI may have had less of an impact because these policies targeted both the demand and supply sides of the housing market. Lu et al. (2021)

suggest that these policies were strictly implemented in provinces with high house prices in Shanghai, Beijing, Guangdong, Tianjian, Hainan and Zheijiang. According to figures 5.6 to 5.10, the house prices of these provinces after 2010 emerged either in the 65th or 70th quantile. This indicates that the influence of FDI is lower in high house priced provinces.

The findings in Table 5.4 also show that income is positive and statistically significant across all the quantiles of the house price distribution. Most notably, I find that given the magnitude of the coefficient, the effect of income on house prices is larger than that of IFDI. The result is consistent with the existing literature (Zhu et al., 2018; Lui and Ma, 2021; Li and Chand, 2013; Kuang et al., 2011; Liang and Go, 2007). According to the results, the magnitude of the income coefficient is high in the lower quantile, specifically in the 5th and 10th quantiles; it is 0.935 and 0.794, respectively. Also, I find that in the 70th and 75th quantiles, the magnitude of the coefficients is high, with the 75th quantile accounting for the largest coefficient across all quantiles at 1.025.

The finding shows that low and high house priced provinces have strong consumption and investment demand. In less economically developed regions with a lower income per capita, an increase in people's income will lead them to purchase houses to reside in or improve their living situation by buying better residential property. This finding is in line with Zhu et al. (2018), that the majority of the individuals in low house prices areas where economic development lags behind coastal and eastern provinces, people purchase houses to live and satisfy their basic needs. Furthermore, high house priced provinces have a stronger investment demand. In these provinces, income per capita is high; when people's income increases, people will choose to purchase houses for investment purposes. This increase in investment demand causes housing prices to rise more quickly. Chen (2016) indicates that owning residential property has always been one of the ideal investments for wealthy Chinese individuals because of the seemingly low risk of real estate.

Table 5.4 also shows that the effect of house supply on house prices is negative and statistically significant at 1% across all quantiles except the 20^{th,} which shows an insignificant result. This is consistent with the findings in the existing literature (Hilber et al., 2014). Limiting the availability of houses, especially when demand is increasing, cause residential properties to become scarce goods, thus increasing house prices. This further emphasises the importance of regulating demand in the housing market. To mitigate possible limitations in supply, the government implemented demand control policies. One of these includes establishing an effective long-term mechanism focused on developing the housing market. Through the encouragement of rental

consumption and stabilising lease relationships, people can rent property as opposed to purchasing it (Lyu and Bu, 2018).

Regarding land prices, the results of Table 5.4 also indicate that land price is positive and statistically significant across all quantiles. The land market is closely related to the housing market, especially in China, as 30% of local government revenue originates from the sale of land to real estate developers. As such, the government is the sole supplier and is in charge of regulating the price of land. Therefore, land prices are a vital factor in determining house prices. Furthermore, the first task of a housing construction project is for developers to obtain a lease or purchase land from the government through bidding, auction and listing. This indicates that land cost is regarded as the basis and bottom line for housing prices (Wang et al., 2018). Therefore, an increase in the cost of land will result in a corresponding rise in house prices.

5.4.2 Quantile Estimation Result for Model with Pollution, 2011 – 2019

In Table 5.5[23], I seek to capture the impact pollution has on house prices in China by estimating equation 5.7, that is, through quantile estimation techniques. Due to the availability of pollution data over a small period, estimations are conducted from 2011 to 2019. Comparing the quantile regression findings to their standard fixed effects counterpart, Model 2 in Table 5.3, a clear difference emerges in terms of the statistical significance of the explanatory variables. In Table 5.3, only three explanatory variables were found to be significant IFDI, land cost and pollution. With the quantiles, every single variable is found to be significant in at least some of the quantiles. The differences can potentially be driven by nonlinear effects, which the quantile estimations can cope with better. These findings provide further support for using the novel approach of quantile estimation employed in the literature explored in this chapter.

The results in Table 5.5 show that pollution has a negative and statistically significant effect on house prices. This finding is in line with Hypothesis 7. It seems to be a concern irrespective of house price quantiles. It was discussed earlier that houses in the lower quantiles tend to be poorer and more rural, but despite these factors, house prices appear to be affected by pollution. I find that the coefficient at the 75th percentile is clearly higher than other quantiles. The results indicate that a 1% increase in nitrogen dioxide, i.e., air pollution, is associated with a 0.23% reduction in residential property prices. This finding affirms Hypothesis 7, which indicates that air pollution negatively impacts house prices in China, especially in highly urban areas. This

[23] See appendix E quantile coefficient estimate for table 5.5.

result is in line with the existing literature (Amini et al., 2021; Tang and Neimeier, 2021), specifically (Zou, 2019), which indicates that the negative and significant impact of pollution on house prices is more substantial in eastern regions than in northern and western areas.

Within the context of Table 5.5, IFDI generally positively and significantly impacts house prices. This finding is consistent with the findings from the previous three models discussed so far, irrespective of model specification and estimation technique used. These results, therefore, provide strong support for a positive and statistically significant impact of IFDI on house prices. This set of findings is closely aligned with the majority of the literature, e.g. Guest and Rhode (2017) and Sa et al. (2014), and affirm further affirms Hypothesis 1.

Table 5.5 Panel Quantile Estimates for the 5th to 75th - 2011 to 2019

	LogIFDI	Log HS	Log Income	Log HC	Log Unemploy	LogLand Cost	Log Pollution	Obs
Quantile	Coef.	Coef.	Coef.	Coef.	Coef	Coef.	Coef.	
0.05	-0.0147	-0.033**	0.225***	0.198**	-0.123**	0.205***	-0.193***	270
	(0.0594)	(0.0132)	(0.0604)	(0.0943)	(0.0508)	(0.0245)	(0.0183)	
0.10	0.0684*	-0.141***	0.35***	0.227***	-0.098***	0.188***	-0.184***	270
	(0.0369)	(0.0241)	(0.0300)	(0.0497)	(0.0223)	(0.0412)	(0.0164)	
0.15	0.170***	-0.0120	0.324***	0.049**	-0.05***	0.039***	-0.189***	270
	(0.005)	(0.012)	(0.020)	(0.022)	(0.020)	(0.007)	(0.003)	
0.20	0.157***	-0.113***	0.118*	-0.0412	0.0569	0.178***	-0.141***	270
	(0.010)	(0.019)	(0.069)	(0.035)	(0.048)	(0.024)	(0.003)	
0.25	0.131***	-0.066***	0.471***	0.0663*	-0.09***	0.067***	-0.173***	270
	(0.007)	(0.013)	(0.020)	(0.034)	(0.013)	(0.005)	(0.006)	
0.30	0.129***	-0.047***	0.444***	0.00188	-0.0167	0.066***	-0.224***	270
	(0.0125)	(0.0176)	(0.0402)	(0.0342)	(0.0382)	(0.0191)	(0.0374)	
0.35	0.0561*	-0.074***	0.596***	0.0435	-0.0042	0.091***	-0.214***	270
	(0.0310)	(0.0150)	(0.0966)	(0.0352)	(0.0379)	(0.0157)	(0.0036)	
0.40	0.140***	-0.050***	0.460***	0.0219	-0.118*	0.0626**	-0.201***	270
	(0.0197)	(0.0187)	(0.0533)	(0.0345)	(0.0636)	(0.0257)	(0.0324)	
0.45	0.127***	-0.076***	0.528***	-0.0628	0.0385	0.069***	-0.167***	270
	(0.0175)	(0.0170)	(0.0375)	(0.0890)	(0.117)	(0.0116)	(0.0203)	
0.50	0.108***	-0.128***	0.575***	0.228***	-0.237***	0.075***	-0.150***	270
	(0.006)	(0.009)	(0.014)	(0.013)	(0.018)	(0.004)	(0.005)	
0.55	0.118***	-0.080***	0.563***	0.0606	-0.150***	0.063***	-0.112***	270

	(0.0127)	(0.0164)	(0.0665)	(0.0518)	(0.0519)	(0.0116)	(0.0270)	
0.60	0.072***	-0.096***	0.604***	0.118***	-0.071**	0.076***	-0.189***	270
	(0.0172)	(0.0147)	(0.0654)	(0.0414)	(0.0300)	(0.0081)	(0.0047)	
0.65	0.102***	-0.122***	0.664***	0.160***	-0.151***	0.044***	-0.196***	270
	(0.0094)	(0.0125)	(0.0409)	(0.0395)	(0.0195)	(0.0154)	(0.0157)	
0.70	0.076***	-0.115***	0.732***	0.0323	-0.0346	0.069***	-0.172***	270
	(0.0137)	(0.0118)	(0.0543)	(0.0435)	(0.0376)	(0.0139)	(0.0101)	
0.75	0.086***	-0.05***	0.699***	0.192***	-0.183***	0.00886	-0.232***	270
	(0.0104)	(0.0083)	(0.0666)	(0.0300)	(0.0236)	(0.0084)	(0.009)	

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. In this table, the dependent variable is highlighted, and independent variables (Log IFDI, Log HS, Log Income, Log HC, Log unemploy and log land cost) are placed on the columns underneath the highlighted dependent variable. Note: HS, HC and Unemploy represent House Supply, Human Capital and Unemployment. The sample for this panel estimation is from 2011 to 2019 and includes pollution. See Appendix D for Quantile Coefficient Estimate, 2011 – 2019 plot.

5.5 Robustness Checks

Following Boumparis et al. (2017) and Kendo and Tchakounte (2021), I control for potential endogeneity by re-running equations 5.6 and 5.7 while treating all explanatory variables as endogenous and using first-order lags as instruments. The corresponding results are reported in Tables 5.6 and 5.7, respectively.

Table 5.6 Panel Quantile Estimates with first order lag instrumental variables, 2006 – 2019

	LogIFDI	**LogHS**	**Log Income**	**Log HC**	**Log Unemploy**	**LogLand Cost**	**Obs**
Quantile	Coef.	Coef.	Coef.	Coef.	Coef	Coef.	
0.05	0.208***	-0.0400***	0.925***	0.0977***	-0.260***	-0.0112	420
	(0.0174)	(0.0126)	(0.0638)	(0.0330)	(0.0360)	(0.0294)	
0.10	0.0143	-0.00371	0.597***	-0.190*	0.0786	0.154***	420
	(0.0479)	(0.0521)	(0.0939)	(0.114)	(0.123)	(0.0277)	
0.15	0.110***	-0.0744***	0.745***	0.0767***	-0.211***	0.133***	420
	(0.00235)	(0.00556)	(0.0174)	(0.0104)	(0.0117)	(0.00889)	
0.20	-0.0140	-0.0450***	0.814***	-0.131*	0.0471	0.170***	420
	(0.0289)	(0.00877)	(0.0295)	(0.0759)	(0.0759)	(0.0323)	

0.25	0.196***	0.0341	0.685***	0.0349	-0.129***	-0.0626	420
	(0.0223)	(0.0235)	(0.0274)	(0.0428)	(0.0188)	(0.0456)	
0.30	0.105***	0.0914	0.758***	0.0397	-0.0958**	-0.103*	420
	(0.00617)	(0.0601)	(0.0189)	(0.0405)	(0.0472)	(0.0556)	
0.35	0.0401***	-0.151***	0.860***	0.0971***	-0.170***	0.187***	420
	(0.00827)	(0.00544)	(0.0214)	(0.0126)	(0.0128)	(0.0119)	
0.40	0.0703***	-0.157***	0.884***	0.178***	-0.253***	0.146***	420
	(0.0129)	(0.00837)	(0.0216)	(0.00813)	(0.00552)	(0.0219)	
0.45	0.0734***	-0.113***	0.939***	0.209***	-0.280***	0.0753***	420
	(0.00672)	(0.00332)	(0.0127)	(0.0151)	(0.00916)	(0.00489)	
0.50	0.122***	-0.176***	0.761***	0.144***	-0.249***	0.139***	420
	(0.00626)	(0.0103)	(0.0304)	(0.0169)	(0.0185)	(0.0127)	
0.55	0.134***	-0.176***	0.808***	0.111***	-0.242***	0.0945***	420
	(0.00720)	(0.00851)	(0.0298)	(0.0268)	(0.0138)	(0.00851)	
0.60	0.122***	-0.180***	0.834***	0.145***	-0.231***	0.0921***	420
	(0.0134)	(0.0132)	(0.0282)	(0.0168)	(0.0207)	(0.00858)	
0.65	0.172***	-0.205***	0.862***	0.189***	-0.334***	0.0684***	420
	(0.0179)	(0.0123)	(0.0788)	(0.0250)	(0.0462)	(0.0154)	
0.70	0.0607**	-0.127***	0.957***	0.140***	-0.192***	0.0833*	420
	(0.0296)	(0.0308)	(0.0240)	(0.0194)	(0.0274)	(0.0438)	
0.75	0.0246**	-0.202***	0.976***	0.214***	-0.137***	0.119***	420
	(0.0124)	(0.0257)	(0.0387)	(0.0709)	(0.0414)	(0.0209)	

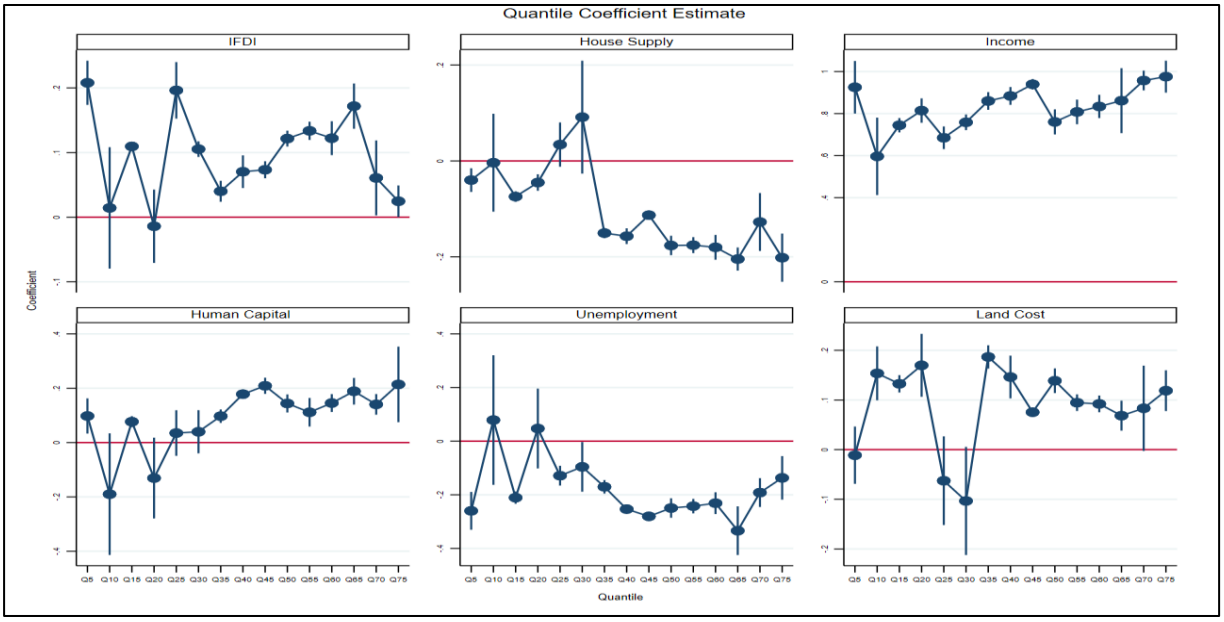
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. In this table, the dependent variable is highlighted, and independent variables (Log IFDI, Log HS, Log Income, Log HC, Log unemploy and log land cost) are placed on the columns underneath the highlighted dependent variable. This estimation includes first-order lags of all the independent variables as instruments. Note: HS, HC and Unemploy represent House Supply, Human Capital and Unemployment. The sample for this panel estimation is from 2006 to 2019 and excludes pollution.

I start by looking at the results in Table 5.6. By and large, the results are consistent with the earlier sets of estimations, thus providing further credibility to the results presented so far. Focussing on the details, The effect of IFDI on house prices is positive and statistically significant across all quantiles aside from the 10th quantile, which shows an insignificant result. This is consistent with the estimation findings in Table 5.4. Also, in line with Table 5.4, I find that in Table 5.6, the magnitude of the IFDI coefficient varies across different quantiles. Additionally, I observe that the magnitude of the IFDI coefficient of the lower quantiles is significantly larger than that of the higher quantiles. Specifically, in the 5th, 15th and 25th quantile estimation, the results indicate that a 1% increase in IFDI will result in a 0.208%, 0.110%, and 0.196% increase

in house prices, respectively. These results are also significantly larger than the 70th and 75th quantile estimation, which depicts that a 1% increase in IFDI will lead to a 0.060% and 0.025% increase in housing prices, respectively. In Figure 5.12, I can observe a graphical representation of the varying magnitude of the coefficients from estimation results displayed in Table 5.11.

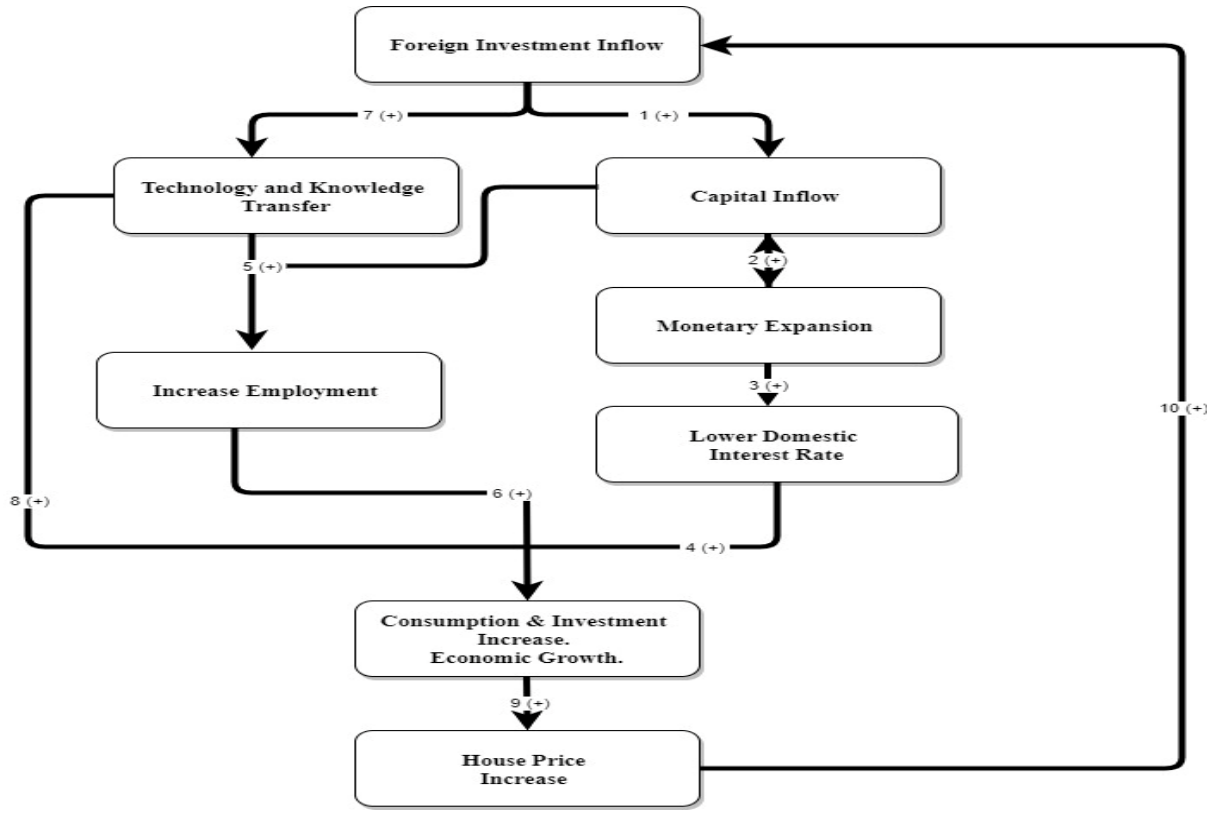
Figure 5.12 displays the coefficient of the panel quantile estimation with first-order lags of the explanatory variables. The Y-axis represents the 5th to the 75th quantile, while the Y-axis shows the coefficient estimation in Table 5.6. The red horizontal line represents the 95% confidence interval.

Figure 5.12 Quantile Coefficient Estimates – First Order lags Instrumental variables, 2006 - 2019



By adopting instrumental variables, I treat all the explanatory variables as endogenous. This allows us to explore further interrelationships among the variables in a more modified version of the demand-driven channel based on Figure 5.13, 5. The inflow of FDI can result in new and advanced technology and knowledge in the host country. This enables the expansion of firm production capabilities and affects employment, wages, and labour productivity (Saucedo et al., 2020). The motivations of multinational corporations for pursuing FDI lie within the scope of factors such as strategy, market, and efficiency-seeking. Supplementary, the pursuit of obtaining a highly skilled or low-skilled workforce internationally through outsourcing or greenfield FDI is a primary reason MNEs pursue international investment (Becker et al., 2020). This inflow of foreign investment creates a demand for labour in the host economy. As such, developing countries seek to attract FDI to generate employment opportunities for their local economy.

Figure 5.13 Demand-Driven Channel (Modified)



According to the demand-driven channel displayed in Figure 5.13, 6. The increase in wages contributes to consumer ability to, thus increasing the consumer's investment and consumption capabilities. Employment and labour demands are directly linked to economic development, rent and house price increase since workers must purchase or rent residential properties (Chakrabarti and Zhang, 2015). In line with this, Mankiw and Weil (1989) indicate that income affects housing demand through its influence on residents' purchasing power. 7. FDI's transfer of knowledge and technology directly enhances host economies' economic growth (Osano and Koine, 2016). 8. New technology brought about by FDI can be transferred to domestic industries, thereby enhancing their production effectiveness and capabilities and fostering innovation within the economy (Swenson, 2004). Additionally, the inflow of knowledge and technology contributes to labour productivity (Sharma and Gani, 2004). The host country's ability to increase innovation and generate an effective workforce contributes to the county's capacity to transition to a higher investment development path[24] (Dunning and Narula, 1996).

[24] The explanation of the investment development path can be in the first chapter.

Technology spillover, knowledge transfer, and capital inflow brought about by foreign direct investment in the region can increase the income per capita of the region's population, infrastructure, and economy. Additionally, inter-regional knowledge movements of labour as FDI stimulates interregional labour migration. When employees trained by foreign firms relocate back to their own regions, they can bring knowledge to the local firms, and thus knowledge diffusion occurs (Holger and Strobl, 2005). This increased economic development enhances the resident's ability to afford residential property for both consumption and investment purposes. This potentially increases the demand for residential real estate and promotes new real estate development to facilitate supply. 9. In sum, an increase in consumption and investment and economic growth raises housing prices (Gholipour, 2013; He and Zhu, 2013; Guest and Rohdes, 2017). Also, the appreciation of property prices tends to be inelastic, which indicates that growth in house and rental prices do not decrease the demand in the short term. As a result, changes in the domestic economy primarily impact the housing market. 10. A feedback channel between housing prices and foreign investment can be identified. As the housing prices increase and the market expands, the real estate sector becomes more attractive to foreign investors; thus, the profitable market will absorb more investment (Gholipour, 2013).

Table 5.7 Panel Quantile Estimates with first order lag instrumental variables, 2011 – 2019[25]

Table 5.7 shows the panel quantile estimation results with first-order lags of the explanatory variables (including pollution).

	Log IFDI	Log HS	Log Income	Log HC	Log Unemploy	Log Land Cost	Log Pollution	Obs
Quantile	Coef.	Coef.	Coef.	Coef.	Coef	Coef.	Coef.	
0.05	0.0256 (0.064)	0.165 (0.204)	-0.147 (0.551)	0.0227 (0.309)	-0.434* (0.231)	0.315** (0.134)	-0.219*** (0.079)	270
0.10	0.151*** (0.023)	-0.0262 (0.0326)	0.344*** (0.076)	0.0744** (0.0320)	-0.0723* (0.0407)	0.0609*** (0.0206)	-0.172*** (0.017)	270
0.15	0.186*** (0.007)	-0.054*** (0.0110)	0.333*** (0.027)	0.164*** (0.012)	-0.117*** (0.0187)	0.0192* (0.0102)	-0.143*** (0.009)	270
0.20	0.173*** (0.007)	-0.0290** (0.011)	0.363*** (0.033)	0.0209 (0.034)	-0.0569** (0.0243)	0.0518*** (0.0070)	-0.146*** (0.007)	270

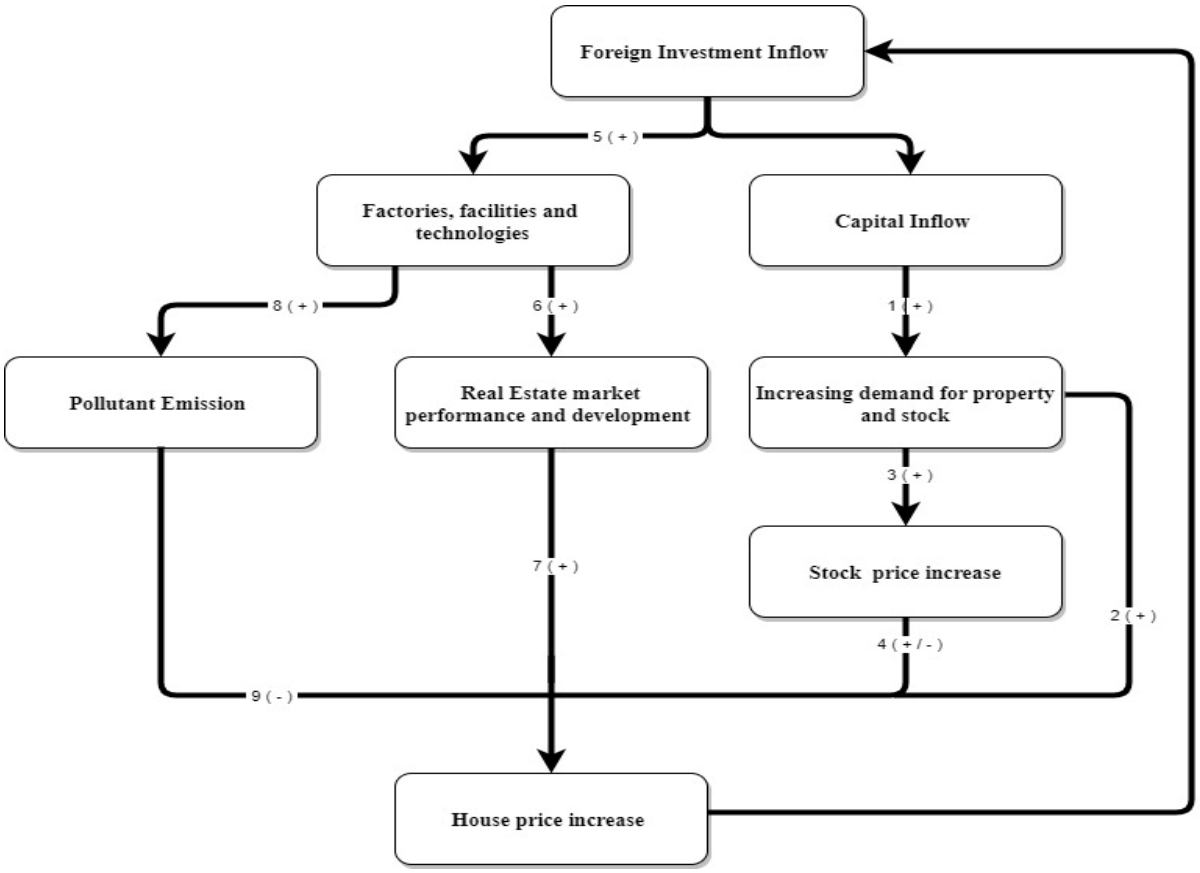
[25] See Appendix E for quantile estimation graph with first order lag instrumental variables (including pollution) 2011 to 2019.

0.25	0.117***	-0.075***	0.471***	0.101***	-0.0754***	0.0797***	-0.184***	270
	(0.0017)	(0.0048)	(0.009)	(0.0074)	(0.007)	(0.0016)	(0.002)	
0.30	0.130***	-0.067***	0.400***	0.0369	-0.0563***	0.0943***	-0.200***	270
	(0.0109)	(0.0046)	(0.026)	(0.0303)	(0.00946)	(0.0034)	(0.0158)	
0.35	0.140***	-0.081***	0.400***	0.101***	-0.176***	0.0939***	-0.159***	270
	(0.0099)	(0.0112)	(0.0236)	(0.0182)	(0.0217)	(0.0122)	(0.0155)	
0.40	0.164***	-0.114***	0.407***	0.167***	-0.213***	0.0632***	-0.157***	270
	(0.0095)	(0.0071)	(0.034)	(0.0112)	(0.0121)	(0.0055)	(0.008)	
0.45	0.151***	-0.103***	0.461***	0.161***	-0.248***	0.0597***	-0.106***	270
	(0.0110)	(0.0071)	(0.041)	(0.0159)	(0.0117)	(0.0038)	(0.005)	
0.50	0.091***	-0.126***	0.504***	0.127***	-0.152***	0.136***	-0.069***	270
	(0.0144)	(0.0084)	(0.038)	(0.0200)	(0.0147)	(0.0151)	(0.011)	
0.55	0.083***	-0.111***	0.591***	0.278***	-0.285***	0.0988***	-0.168***	270
	(0.0120)	(0.0099)	(0.011)	(0.0071)	(0.0133)	(0.0157)	(0.0057)	
0.60	0.108***	-0.111***	0.509***	0.160***	-0.168***	0.0793***	-0.183***	270
	(0.0402)	(0.0158)	(0.186)	(0.0567)	(0.0175)	(0.0248)	(0.0341)	
0.65	0.044***	-0.109***	0.611***	0.128***	-0.238***	0.143***	-0.045**	270
	(0.0080)	(0.0033)	(0.021)	(0.0214)	(0.00551)	(0.0057)	(0.0211)	
0.70	0.030***	-0.069***	0.690***	0.0676***	-0.159***	0.111***	-0.157***	270
	(0.0042)	(0.0046)	(0.011)	(0.0097)	(0.00450)	(0.0062)	(0.006)	
0.75	0.089***	-0.089***	0.708***	0.213***	-0.251***	0.0228**	-0.131***	270
	(0.008)	(0.0065)	(0.014)	(0.0153)	(0.0152)	(0.0096)	(0.006)	

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. In this table, the dependent variable is highlighted, and independent variables (Log IFDI, Log HS, Log Income, Log HC, Log unemploy and log land cost) are placed on the columns underneath the highlighted dependent variable. This estimation includes first-order lags of all the independent variables as instruments. Note: House Supply, Human Capital and Unemployment are represented by HS, HC and Unemploy. The sample for this panel estimation is from 2011 to 2019 and includes pollution. See Appendix E for Quantile Coefficient Estimate with first order lag instrumental variables, 2011 – 2019 plot.

Looking now at the results in Table 5.7, it would seem once again the results are largely consistent with earlier estimations in Table 5.5. and also the existing literature. FDI has a positive and statistically significant effect on house prices in all the quantiles, excluding the 5th quantile, which is positive but not statistically significant. We also find that pollution is negative and statistically significant across all quantiles. Given that we assume that all the explanatory variables in Table 5.7 are endogenous, we introduce a modified version of the property-driven demand in Figure 5.14.

Figure 5.14 Property-Demand Driven Channel (Modified)



It has been established in the existing literature and our results that IFDI positively affects house prices. 8. Foreign firms in polluting sectors will tend to establish factories in developing countries like China in order to reduce the cost associated with greenhouse emissions (Cole et al., 2011). 9 Pollution emissions such as nitrogen oxide and carbon dioxide deter the air quality, contributing to increased levels of hazardous air pollutants (HAP), which may cause severe health effects (Amini et al., 2021; Chen et al., 2017). In line with this, Liu et al. (2018) indicate that the effects of air quality are partially reflected in house prices as residents are willing to pay a premium for better air quality. As such, residents tend to relocate to less polluted urban areas, thus expanding the housing markets of certain regions relative to others (Sullivan, 2016; Chen et al., 2017).

5.6 Conclusion and Policy Implication

In recent years, China has experienced a substantial inflow of FDI, which has been influential in the restructuring and development of its economy. The rapid influx of foreign investment has

been identified as a significant cause of the rapid rise in house prices. The inflow of FDI enhances China's economy through capital inflow, knowledge and technology transfer, which translates to facilitating monetary expansion, an increase in technological capability, labour productivity and income. These factors increase China's residents' consumption and investment capabilities, thus expanding the demand for residential properties and increasing the price. Behind the success of China's expanding housing market, the country faces regional disparity in its house prices, and FDI is thought to exacerbate this effect. Eastern coastal provinces and those with SEZ zones and open coastal cities have higher prices than inland provinces. Areas like Bejing, Shanghai, Zhejiang and Guangdong, which attract a substantial amount of FDI, have a more developed housing market than provinces like Ahuni and Gansu, which do not. Therefore, This Chapter seeks to get further insights into the link between IFDI and house prices.

With respect to China, most studies either focus on the link between these two variables at an aggregate level or investigate the impact of real estate related FDI on the housing market. The regions of China display substantial differences in house prices; likewise, the inflow of FDI varies considerably per region. These differences warrant a closer look at the FDI/house price relationship from a regional perspective. There are a handful of regional studies on China; however, the studies tend to focus on specific regions or cities. In contrast, this chapter considers the broadest level of regions, based on data availability, in comparison to earlier work. This chapter makes two further contributions: (i) It adopts the novel method of dynamic panel quantile estimation with non-additive fixed effects in addition to commonly used panel data methods. (ii) It also investigates the effects of pollution on house prices, which is an emerging topic, and little work exists in China, especially from the regional perspective.

The results convincingly support the positive effect of IFDI on house prices at a regional level. This result corresponds to the broader literature on FDI and house prices. Several interesting conclusions emerge from this finding. (i) it would appear that real estate-specific FDI, which increases housing supply and dampens house prices, is not sufficient to counter the wealth effects generated by the inflow of FDI, which subsequently puts upward pressure on house prices. (ii) While increasing house prices will benefit investors in the housing market and asset (housing) holders as increasing house prices enables them to increase their consumption or it increases the collateral value of their property, it exacerbates housing affordability issues. This is more so in some of the regions. FDI inflow seems to contribute to the housing unaffordability issue. The findings have implications not just for policymakers in China but also globally. As discussed in the preceding chapters, most, if not all, developing and less developed countries

are trying to attract more FDI, and those at a more advanced stage of benefiting from FDI are trying to generate outward FDI. However, very little attention is often paid to the adverse consequences of FDI. Housing affordability is such an issue, perhaps, unintended, but nevertheless a consequence of increasing prosperity that results from FDI. Whilst policymakers globally are working towards generating more FDI, it is important that the intended social consequences of FDI, such as housing unaffordability, are also considered.

Adopting the novel method of dynamic panel quantile estimation with non-additive fixed effects also proved beneficial, as the variables that were not found significant with the standard fixed effects method were found to be significant in at least some of the quantiles. The differences in results between the standard fixed effects and the quantile fixed effects methods may be due to nonlinearities in the relationship between IFDI and house prices, which the quantile estimation method is better at coping with.

Third, income has a positive and significant influence on house prices in all the quantiles. This shows that the effect of income on house prices is significantly larger than IFDI. The magnitude of the income coefficient was also higher in the 70^{th} and 75^{th} quantiles than in the lower ones, suggesting that the influence of income is greater in high-price provinces and smaller in low-price areas. I also find that house supply and unemployment have a predominantly negative effect on house prices across the different quantiles. These results are consistent with the empirical findings established in the existing literature. Pollution also proved to be a significant explanatory variable for regional house prices. A result, which is not surprising but what seems somewhat surprising, is that house prices in the bottom quantiles are also affected by pollution. Quite often, the houses in the bottom quantiles are further away from major employment centres and perhaps remote, but pollution still affects them.

In terms of policies specific to China, the following recommendations are presented. First, the effect of these variables, especially IFDI, on housing prices is heterogeneous. Thus, the government should adopt distinct policies to control housing prices in different provinces. The effect of IFDI is greater in provinces with low house market development levels. These areas are generally inland regions that lag in economic development. Therefore, the government should implement policies that enhance IFDI in these regions. The effect of income is greater in high-price regions because investment demand in these provinces is high. The government should take measures to control real estate investments. In addition, the consistent increase in rural-urban migration cannot be ignored. Economic development in China is not evenly

distributed across the regions. Many people migrate to developed provinces, resulting in the rapid growth of housing prices and increased air pollution. The government should balance the economic development of all regions and implement policies to tackle unemployment and medical and educational problems in underdeveloped cities to prevent the oversaturation of urban areas.

CHAPTER 6 CONCLUSION

6.1 Summary of the Main Findings

This thesis explores three research questions that were considered based on the latest trends and expansion of Chinese FDI after the Chinese implemented the EJV law in 1979 and promoted the “Go Global” policy in the early 2000s. The three empirical studies are closely related in terms of the primary focus on FDI, even though they have separate research objectives and answer different research questions. The first empirical question focuses on the sectorial factors that impact OFDI relative to IFDI. I study this in the context of China because existing studies that focus on OFDI from emerging economies are limited in the international business literature. Also, I find that China offers an interesting perspective, given its unique institutional framework and its success in transitioning from a predominant host of IFDI to a major global investor at a fast pace. I adopt sector-level data as a motivation to contribute to the existing literature, as studies that adopt this form of data in the context of China are also limited.

Additionally, I can establish a clear understanding of China’s sector orientation. In the second empirical study, I investigate the effects of leverage on the probability of Chinese MNEs pursuing international investment. In this study, I adopt firm-level M&A data to understand how factors like profitability, tangibility, firm size, debt-to-asset leverage ratio, Debt to Capital, and short-term and long-term debt-to-asset ratio contribute to a firm’s ability to pursue OFDI. Through this, I investigate how firm-level financial factors contribute to OFDI. The third empirical study takes a different approach by focusing on inward FDI. Specifically, it examines the effect of regional IFDI on regional house prices. I obtained novel datasets, methodologies, and insightful results in these three empirical studies to address the three research questions. Below are the key findings of chapters 3, 4, and 5.

6.1.1 Sectorial determinants of OFDI relative to IFDI.

This study examines the interplay of push factors that enabled China to become an outward foreign investor. In order to achieve this, I utilised the share of OFDI relative to IFDI to examine factors that contribute to the increasing rate of China’s OFDI relative to IFDI. Our dataset comprised 14 of China’s sectors of sectors from 2009 to 2015. By adopting fixed-effects

estimation methods, I establish several findings. In Model 1 of Table 3.5, I find that capital and export have a positive and statistically significant impact on the share of OFDI relative to IFDI. Although technology and import both have a positive effect on the dependent variable, the results are not statistically significant. I also find that sectorial market size proxied by GDP per capita has a negative and statically significant impact on the share of OFDI relative to IFDI.

In models 2 and 3, I proceeded toward separating export and import and found that import and export have a positive and significant effect on the dependent variable. Finally, in model 4, I adopt and incorporate trade openness into the model and find that it is an essential factor that has enabled China's transition into a global investor. In models 1 and 2 in Table 3.5 and model 4 in Table 3.7, Capital abundance remains positive and significant, indicating that China's sector-level capital has contributed to China's OFDI success. Based on the result, the study confirms that export is complementary to OFDI. Additionally, I find that domestic sectors in China can learn through technology and knowledge transfer through imports.

Interestingly, I find that market size has a negative and statistically significant effect on the share of OFDI relative to IFDI. This result is counter-intuitive and inconsistent with the majority of the existing literature. However, I explain that it is possibly due to limitations in the existing market of specific sectors that cause MNEs to pursue international investment. For example, I find evidence that the mining and quarrying sector has a positive and significant effect on the share of OFDI relative to IFDI than the agricultural sector. Given the limitation of China's natural resources and precious metal reserves, the Chinese government promotes OFDI to extractive industries of developing economies such as Sub-Saharan African countries to obtain natural resources and cater to China's domestic demand and rapid industrialisation.

6.1.2 The Effect of Leverage on the Internationalisation of Chinese Firms.

This study investigates the impact of leverage on the probability of Chinese firms pursuing international investment. I investigate this effect using data comprising 200,000 firm-year observations from 2008 to 2017. By adopting a linear probability model with high dimensional fixed effects in order to account for time-invariant firm fixed effects, country fixed effects, time fixed effects, and time-country fixed effects, I estimate the impact of leverage on the probability of internationalisation. In the results displayed in Table 4.3, I find that the two measures for leverage, debt to asset and debt to capital, leverage has a negative and significant impact on the probability of Chinese firms pursuing international investment. I find that the underinvestment

theory holds in the context of emerging economies and international investment. Based on the findings and assertions of the underinvestment theory, firms that adopt a high degree of debt financing and or are overleveraged run this risk of debt overhang. In this situation, Chinese firms that are overleveraged will be unable to pursue international projects with a positive NPV for fear that the returns of the investment will be transferred to the debt holders. Additionally, by focusing on Chinese parent companies as acquirers, we find that overleveraged acquires will be restricted by their ability to issue capital for potential acquisition and merger deals.

Based on the findings of Table 4.3, I also find evidence that corresponds to the overinvestment theory. In this situation, leverage serves as a governance tool imposed by the shareholders in order to curb the overinvestment activities of managers. Given the situation that managers are likely to pursue unprofitable investments, debt can be used as a tool where managers are compelled to pay interest on the debt frequently. Thus, curbing the cash flow available for irregular spending. However, this does not apply to Chinese SOEs because the Chinese government is both the major shareholder and debt holder. As such, Chinese SOEs are subject to soft budget constraints, and international investment is not solely based on profit-seeking but aligned with the government's domestic and foreign policy intentions. Managers of SOEs attribute losses to heavy policy burdens imposed by the Chinese government, thus masking poor performance. Additionally, leverage is not a major factor for Chinese SOEs because the government is most likely to bail them out if they go bankrupt. Although this is the case for SOEs, private firms are not privy to SOEs' same soft budget constraints. These companies do not have government affiliations. Therefore, they are not constrained by heavy policy burdens. As such, international investment is focused on maximising shareholder wealth. In this case, leverage is an effective governance tool to curb overinvestment. Finally, I find that profitability, firms' size, and tangibility have a positive and significant effect on the probability of firms pursuing international investment projects.

6.1.3 The effect of IFDI on regional house prices.

This study investigates the effect of IFDI on regional house prices in China. In order to achieve this, I a panel estimation with non-additive fixed effect effects on data comprising 31 Chinese provinces from 2006 to 2019. I adopt this estimation technique to determine how IFDI and other explanatory variables such as income, house supply, unemployment, human capital, land cost, and pollution affect different quantiles of the house prices distribution. Based on the results of the estimation, I discover the following findings. Firstly, I find that low-priced provinces make up

the low quantile of the house prices distribution. These provinces are predominantly located in the inland regions of China and are regarded as areas with lower IFDI, economic development, income per capita, and human capital than coastal areas. Furthermore, I discover that high priced provinces fall within the 50^{th} to 75^{th} high quantile band of the house prices distribution. These areas are predominantly located in China's coastal and northern regions and are characterised by their high IFDI, economic development, and income per capita. Additionally, these areas are more urbanised than the inland provinces.

Secondly, I find that IFDI has a positive and significant effect on house prices across the majority of the quantile. Interestingly, I find that IFDI has more impact in the lower than higher quantile of the house price distribution. A possible explanation is that in these low-priced provinces where house prices were the lowest in the sample, I find that the impact of IFDI is relatively high compared to other parts of the house price distribution since average prices in these regions experienced a high growth due to the initial low level. Additionally, it could be likely due to the implementation of aggressive policies in 2010 aimed at addressing increased house prices in China. These policies were based on using loan, price and sale restrictions to heavily curb demand in high-priced areas like Beijing and Shanghai.

Thirdly, I find that income has a positive and significant influence across all quantiles and is most apparent in the 70^{th} and 75^{th} quantiles. These findings indicate that the impact of income on house prices in China is more prominent in high-priced areas and lower in low prices provinces. Thus, our results suggest that in high-priced areas with high income per capita, the residents can purchase houses for both consumption and investment, thus increasing the demand and raising the prices. However, in low-price areas characterised as low-income areas, residential properties are predominantly regarded as necessary to improve their living standards, and income will most likely not be used for residential investments.

Finally, I find that house supply and unemployment maintain a negative and statistically significant effect on house prices across major quantiles. At the same time, human capital and land cost sustained a positive influence on the dependent variable. Our investigation takes a step further by estimating the impact of greenhouse gas emissions on house prices. The finding indicates that pollution has a consistently negative effect across all the quantiles of the house price distribution. Additionally, I find that the effect of pollution is most prominent in the high quantile of the house prices distribution. Thus, indicating that pollution is higher in more urban high, priced provinces.

APPENDIX

Appendix A– Variable Source, Description and Industry Classification

Variable	Measure	Level	Source	Industry Classification
Sectorial Outward Foreign Direct Investment (OFDI)	Flow of Outbound Direct Investment by Sector (USD 10000)	Sector Level	CEIC	China National Classification System (GB/T4754-2002, "GB2002")
Sectorial Inward Foreign Direct Investment (OFDI)	Flow of Inward Direct Investment by Sector (USD 10000)	Sector Level	CEIC	China National Classification System (GB/T4754-2002, "GB2002")
Sectorial Import	Gross Import (USD, Millions)		OECD	ISIC Rev 4
Sectorial Export	Gross Export (USD Millions)		OECD	ISIC Rev 4
Sectorial GDP	Revenue of Chinese Firms (USD Millions)	Firm Level	ORBIS	NACE Rev 2
	GDP (US Millions at 2010 constant prices	National Level	UNCTAD	
Sectorial Technology	Research and Development Expenditure (US Millions)	Firm-Level	ORBIS	NACE Rev 2
	Research and Development Expenditure (US Millions)	National Level	OECD	
Sectorial Capital Formation	Total Assets (US Millions)	Firm-Level	ORBIS	NACE Rev 2
	Gross Capital Formation	National Level	OECD	
Labour Force	Number of Employed Persons (10000)	Sectorial Level	National Bureau of Statistics	China National Classification System (GB/T4754-2002, "GB2002")

Exchange rate	Real Effective Exchange rate	National Level	UNCTAD	

According to Appendix A, the sector-level variables in the sample have distinct industry classifications. Sectorial OFDI, IFDI and labour force have the Chinese national classification system (GB/T4754-2002, “GB2002”). Sector-level import and export data possess an ISIC Rev 2 industry classification. While sector-level GDP, technology and capital formation have a NACE Rev 2 industry classification. The NACE Rev 2 industry classification is similar to the ISIC Rev 4. Therefore, merging the datasets with these classifications was direct. However, the China national classification is slightly different from the aforementioned two. Specifically, unlike the ISIC Rev 2 and NACE Rev 2, the electricity and water supply sector is disaggregated into two separate sectors in the China national industry classification. In order to resolve this, we aggregate the two sectors in the dataset that have China’s national industry classification.

Appendix B - Descriptive Statistics for Variables by Sector

Descriptive Statistics – Agriculture, Forestry and Fishing					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	175256	25656.85	142873	206220
OFDI	7	136522	83405.71	34279	257208
Share OFDI/IFDI	7	3.532	2.503	1.366	7.481
Capital	7	4771.104	1294.54	2830.097	6311.348
GDP	7	17046.68	8329.919	9158.021	32806.23
Technology	7	472.160	319.4379	45.017	838.748
Export	7	13560.42	2506.244	9256.039	16490.05
Import	7	60821.77	18537.31	28974.14	78676.99
Exchange Rate	7	110.7821	10.934	100	129.931
Average Wage	7	3584.406	1122.609	2101.468	5129.997
Descriptive Statistics – Mining and Quarrying					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	53404.71	18255.57	24292	77046
OFDI	7	1423678	577271.5	571486	2480779
Share OFDI/IFDI	7	207.117	186.4249	65.255	586.124
Capital	7	163897.6	83520.32	86984.51	306091.5
GDP	7	592693.9	86637.48	492870.6	697837.2
Technology	7	47545.95	20868.22	27662.86	88121.99
Export	7	6915.517	836.710	6057.998	8390.961

Import	7	310520.8	92351.45	155379.6	395894.3
Exchange Rate	7	110.782	10.934	100	129.931
Average Wage	7	8355.081	1716.987	5568.099	10039.5
Descriptive Statistics – Manufacturing					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	4605224	478770.9	3954290	5210054
OFDI	7	848296.7	563988.3	224097	1998629
Share OFDI/IFDI	7	0.869	0.604	0.290	1.985
Capital	7	931014.3	324008.4	666810.1	1473479
GDP	7	4109701	356022.8	3674084	4666818
Technology	7	170022.5	65037.65	64532.77	248356.5
Export	7	1664354	381815.7	1006159	2051347
Import	7	933304.3	213274	560650.4	1169261
Exchange Rate	7	110.782	10.934	100	129.93
Average Wage	7	6500.429	1879.687	3924.516	8883.838
Descriptive Statistics – Electricity and Water					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	212520.7	24175.08	163897	242910
OFDI	7	140934.3	67410.02	46807	213507
Share OFDI/IFDI	7	4.275	2.364	1.067	6.960
Capital	7	169628.1	80427.79	110132	290349.3
GDP	7	351435.7	41070.41	319863.7	437153.1
Technology	7	2900.403	2222.09	572.987	5673.419
Export	7	5291.761	1484.26	3063.327	7181.977

Import	7	1516.727	278.719	1270.05	2098.33
Exchange Rate	7	110.782	10.934	100	129.93
Average Wage	7	9418.48	2491.373	6128.89	12667.39
Descriptive Statistics – Construction					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	118130.1	29859.42	69171	155876
OFDI	7	262533.1	143256.7	36022	436430
Share OFDI/IFDI	7	11.483	5.823	4.226	18.219
Capital	7	98343.24	26475.74	64098.29	125443.5
GDP	7	386315.6	186713.3	188383.4	698276.3
Technology	7	36778.93	6646.025	30046.04	48845.21
Export	7				
Import	7	895.1686	206.316	512.46	1133.45
Exchange Rate	7	110.7821	10.934	100	129.93
Average Wage	7	5778.168	1670.447	3536.749	7850.034
Descriptive Statistics – Wholesale and Retail					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	898134.3	241576.6	538980	1202313
OFDI	7	1262751	519619.8	613575	1921785
Share OFDI/IFDI	7	7.809	1.944	5.827	10.879
Capital	7	108267.5	52286.72	55066.22	198302.9
GDP	7	871497.1	663363.3	189037.3	1771860
Technology	7	7171.015	5244.802	922.861	14322.02

Export	7	84270.85	23984.1	49095.01	113712
Import	7	152946.9	33852.12	92412.35	188360.8
Exchange Rate	7	110.782	10.934	100	129.931
Average Wage	7	7108.944	2040.487	4265.441	9687.372
Descriptive Statistics – Transportation and storage					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	347065.7	86728.98	224373	445559
OFDI	7	335482.9	120960.7	206752	565545
Share OFDI/IFDI	7	8.314	1.256	6.580	10.334
Capital	7	64128.69	19816.67	35164.68	83171.14
GDP	7	150824.9	84488.34	60321.52	262771.8
Technology	7	2449.384	1437.262	45.017	3970.865
Export	7	67305.66	14067.61	44532.35	83183.15
Import	7	93874.08	21608.04	54512.84	115979.1
Exchange Rate	7	110	10.934	100	129
Average Wage	7	8232.099	2198.549	5169.499	11051.33
Descriptive Statistics – Accomodation and Food Service					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	73993.14	16514.04	43398	93494
OFDI	7	22810.29	22766.66	7487	72319
Share OFDI/IFDI	7	1.565	1.677	0.288	5.146
Capital	7	5134.837	2748.281	2124.404	9123.485
GDP	7	12807.54	10526.54	3133.99	28344.72
Technology	5	28.202	13.257	11.937	47.476

Export	7	1620.054	177.316	1356.261	1773.912
Import	7	34741.05	18914.49	13698.6	61641.98
Exchange Rate	7	110.782	10.934	100	129
Average Wage	7	4832.468	1312.331	3053.54	6552.561
Descriptive Statistics – Information and Communication					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	289458.7	53912.62	224694	383556
OFDI	7	202739.3	231763.9	27813	682037
Share OFDI/IFDI	7	3.103	1.618	0.875	5.456
Capital	7	57624.2	24688.2	35119.4	98716.38
GDP	7	143261.5			
Technology	7	12665.16		1913.249	25099.14
Export	7	5206.189	912.569	3984.724	6206.498
Import	7	24644.36	8369.428	12638.31	34597.23
Exchange Rate	7	110	10.934	100	129
Average Wage	7	12977.22	3554.296	8512.729	17991.52
Descriptive Statistics – Financial and insurance activities					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	387004.3	502921.2	45617	1496889
OFDI	7	1268159	622651.5	607050	2424553
Share OFDI/IFDI	7	9.373	2.699	5.458	13.527
Capital	7	1752489	995679.2	335987.3	2816976
GDP	7	462880	283886.5	169978.6	995942.1
Technology	6	178.260	100	107.435	379.810

Export	7	926.797	238.542	605.061	1270.113
Import	7	12336.2	6318.863	3296.99	18097.71
Exchange Rate	7	110	10.934	100	129.931
Average Wage	7	14015.84	3631.009	8841.212	18430.7
Descriptive Statistics – Real Estate Activities					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	2631531	553132.6	1679619	3462611
OFDI	7	355534.4	267217.8	93814	778656
Share OFDI/IFDI	7	0.536	0.309	0.302	1.155138
Capital	7	86970.74	49948.74	40444.93	163122.5
GDP	7	111310.3	91322.99	26052.17	249031.4
Technology	6	202.409	147.751	11.937	387.723
Export	7	407.811	66.754	305.442	479.948
Import	7	5060.717	2495.885	2258.79	8710.83
Exchange Rate	7	110	10.934	100	129.931
Average Wage	7	7287.71	1856.895	4719.666	9673.884
Descriptive Statistics – Education					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	1830.286	1087.859	395	3437
OFDI	7	3412.286	3690.509	200	10283
Share OFDI/IFDI	7	7.984	5.309	1.573	6.853
Capital	6	1745.241	2047.289	3.648	4347.271
GDP	6	4487.927	5152.48	12.339	11291.55
Technology	3	56.053	68.362	9.332	134.516

Export	7	85.855	14.8725	64.83	99.742
Import	7	6110.006	3495.084	2220.3	11245.29
Exchange Rate	7	110	10.934	100	129.931
Average Wage	7	7620.996	1978.3	5056.492	10693.24
Descriptive Statistics – Arts, Entertainment and Recreation					
Variables	Obs.	Mean	S.D.	Min	Max
IFDI	7	62262.29	20115.87	31756	82338
OFDI	7	44072.43	59791.38	1976	174751
Share OFDI/IFDI	7	1.564	1.232	0.427	4.118
Capital	7	2011.099	774.400	1154.724	3075.5
GDP	7	2625.727	1489.732	1253.454	5097.475
Technology	5	131.796	116.895	11.202	269.032
Export	7	494.973	88.908	357.144	606.781
Import	7	6595.709	3073.75	2862.23	10869.14
Exchange Rate	7	110	10.934	100	129.931
Average Wage	7	8468.584	2269.579	5526.673	11684.33

In order to compare the difference, this study also compares the summary statistics of each of the 13 sectors. In terms of Capital Formation in different sectors, the finance and insurance activities sector is ranked the highest in China, followed by the manufacturing sector and the Electricity and Water Supply sector. With respect to GDP, manufacturing accounts for the highest GDP contribution, followed by wholesale and retail trade sectors and the mining and quarry sectors. Technology is measured by research and development expenditure, and the manufacturing sector is stated as the highest. This is followed by the mining and quarry, construction and information & communication sectors. Regarding Import, the manufacturing sector displays the highest amount followed by mining and quarry, and wholesale and retail trade. Additionally, the manufacturing sector accounts for the highest gross export in the sample.

This is followed by the wholesale and retail and the mining and quarry sectors. The exchange rate changes over time, but it does not vary across sectors by definition.

Appendix C Descriptive Statistics by Province

	House Prices	FDI	Income	Human Capital	Unemployment	Land Cost	Pollution
Anhui							
Mean	5771.431	393178.6	17593.71	25.97	29.65	723.14	75.14
S.D	1953.107	292520.3	4788.08	6.00	2.05	572.53	15.16
Min	2653.788	145913.9	9771	14.42	26.8	105.91	50.76
Max	8697.69	1144326	26415	33.52	33.10	2127.11	95.91
Obs	14	14	14	14	14	14	9
Beijing							
Mean	26828.84	1703514	40394.93	15.05	8.39	1243.54	13.78
S.D	11801.81	1268946	15519.7	0.57	1.13	651.09	3.47
Min	9778.11	555748.6	19978	13.55	7.4	60.31	9.61
Max	47829	4141998	67756	15.54	10.6	2052.92	18.83
Obs	14	14	14	14	14	14	9
Chongqing							
Mean	6606.32	388682.1	19396.57	14.67	13.90	564.47	30.34
S.D	2063.68	224372.8	5127.94	4.28	1.46	425.09	7.94
Min	3231.60	74152.98	11570	7.65	12.1	134.05	17.52
Max	9991	767314.3	28920	20.08	17.5	1484.73	40.26

Obs	14	14	14	14	14	14	9
Fujian							
Mean	9940.194	1152629	24100.64	16.91	15.40	952.96	38.38
S.D	2780.98	452223.6	6352.67	3.60	1.02	582.90	7.62
Min	4972.68	700067.9	13753	9.5	14.3	277.23	26.18
Max	13118	2055044	35616	20.44	17.3	2151.91	49.45
Obs	14	14	14	14	14	14	9
Gansu							
Mean	5470.631	63069.61	13648.64	10.11	9.92	66.65	37.12
S.D	2703.24	51989.67	3050.49	2.34	0.52	66.45	9.30
Min	1870.79	22325.63	8921	5.74	9.3	14.87	21.97
Max	9437	176972.1	19139	12.48	10.8	236.82	48.09
Obs	14	14	14	14	14	14	9
Guangdong							
Mean	10393.46	5229709	26509.5	39.23	37.71	1718.11	103.06
S.D	3805.90	4125141	6737.97	10.92	1.21	1746.30	23.59
Min	6252.61	2506052	16016	19.6	36.2	229.18	69.97
Max	17973.5	13500000	39014	52.39	39.6	5880.44	138.82
Obs	14	14	14	14	14	14	9
Guangxi							
Mean	5493.341	261835.2	17028	16.01	18.37	315.56	43.25
S.D	1575.41	133290.8	3786.173	4.49	1.32	302.90	7.00
Min	2431.23	143521.9	9899	8.23	14.7	67.17	30.29

Max	7284	633084.4	23328	23.31	20	1201.38	50.43
Obs	14	14	14	14	14	14	9
Guizhou							
Mean	5348.95	106335	14397.07	9.90	13.47	133.69	44.73
S.D	1668.77	106677.2	3370.69	3.79	1.26	140.12	10.77
Min	2627.82	20730.94	9117	5.32	12.1	32.4	23.15
Max	7837.90	336590.3	20397	16.97	15.3	548.75	56.35
Obs	14	14	14	14	14	14	9
Hainan							
Mean	12327.11	391105.1	17733.64	3.87	4.82	126.949	8.38
S.D	4409.39	248820.8	5087.49	1.178	0.842	105.65	1.829
Min	4581.91	94086.57	9395	1.64	2.9	21.98	4.87
Max	18627	722119.6	26679	5.04	5.6	345.5	10.34
Obs	14	14	14	14	14	14	9
Hebei							
Mean	6337.93	427891.5	17537.64	30.77	35.79	345.61	147.41
S.D	2139.42	252906.7	4389.036	4.05	3.58	167.03	26.75
Min	2842.27	196943.9	10305	22.1	28.7	66.2	101.65
Max	9878.5	1098371	25665	35.78	39.9	728.4	180.11
Obs	14	14	14	14	14	14	9
Heilongjiang							
Mean	6318.073	164846.7	16486.5	18.29	36.742	116.66	63.314
S.D	2410.03	65884.35	4635.138	2.10	4.02	62.78	14.18
Min	2639.353	109236.1	9182	13.1	31.2	27.77	36.84

Max	10476.5	318103.5	24254	20.38	41.4	277.98	78.38
Obs	14	14	14	14	14	14	9
Henan							
Mean	5231.194	391698.8	16783	41.87	40.24	499.41	121.83
S.D	2026.899	2026.89	211196.5	4029.119	11.04	446.53	38.12
Min	2328.42	185781.1	9810	20.21	33.1	91.28	60.77
Max	8219	803493.5	23903	59.34	49.4	1626.67	166.54
Obs	14	14	14	14	14	14	9
Hubei							
Mean	6575.144	503857.6	18467.14	35.39	44.67	515.42	52.71
S.D	1874.533	315345.8	5383.713	4.20	9.28	404.37	10.81
Min	3352.31	223256.3	9803	26.26	32.9	102.93	35.63
Max	10298.5	1287986	28319	39.49	55.7	1361.5	66.96
Obs	14	14	14	14	14	14	9
Hunan							
Mean	5041.878	446602.2	18465.43	28.69	43.7	284.21	53.75
S.D	1601.64	411712.2	4908.297	4.88	4.10	156.80	9.301
Min	2102.04	169834.2	10505	19.13	31.1	85.36	37.07
Max	7519.5	1272013	27680	36.19	47.8	617.69	66.64
Obs	14	14	14	14	14	14	9
Inner Mongolia							
Mean	4698.14	204201.8	20364.71	9.80	23.25	120.30	102.82
S.D	1425.72	84441.52	5931.36	2.18	3.43	45.66	36.179
Min	2196.59	118006.9	10358	5.57	18	62.51	58.97

Max	7363.31	403594.8	30555	12.47	28.1	201.19	142.19
Obs	14	14	14	14	14	14	9
Jiangxi							
Mean	5205.764	386644.8	17391.5	24.31	28.02	183.56	51.274
S.D	1948.31	153686.3	4783.404	4.32	3.17	142.59	6.97
Min	2537.88	184983.8	9551	14.11	24.3	52.43	40.68
Max	7956	697643.3	26262	31.1	35.1	540.8	61.23
Obs	14	14	14	14	14	14	9
Jilin							
Mean	6644.80	219847.7	17300.71	14.34	24.1	147.12	46.37
S.D	1985.21	86340.84	4351.884	2.25	1.57	78.17	12.70
Min	3235.61	121525	9775	10.25	22.2	40.76	24.52
Max	9408.265	444188.4	24563	17.18	26.8	311.8	60.47
Obs	14	14	14	14	14	14	9
Liaoning							
Mean	7364.43	1361849	21274.07	23.12	43.22	490.48	86.20
S.D	2080.04	641610.8	6538.62	3.66	4.25	277.77	14.60
Min	4197.776	753489.9	10370	15.5	38.1	197.18	61.53
Max	11479.5	2782905	31820	27.59	54.1	1104.83	106.28
Obs	14	14	14	14	14	14	9
Ningxia							
Mean	4553.39	59902.12	16696.79	2.24	4.85	40.60	32.61
S.D	1216.64	63461.36	4309.957	0.703	0.317	25.25	12.17
Min	2454.89	16607.24	9177	1.1	4.2	7.6	15.49

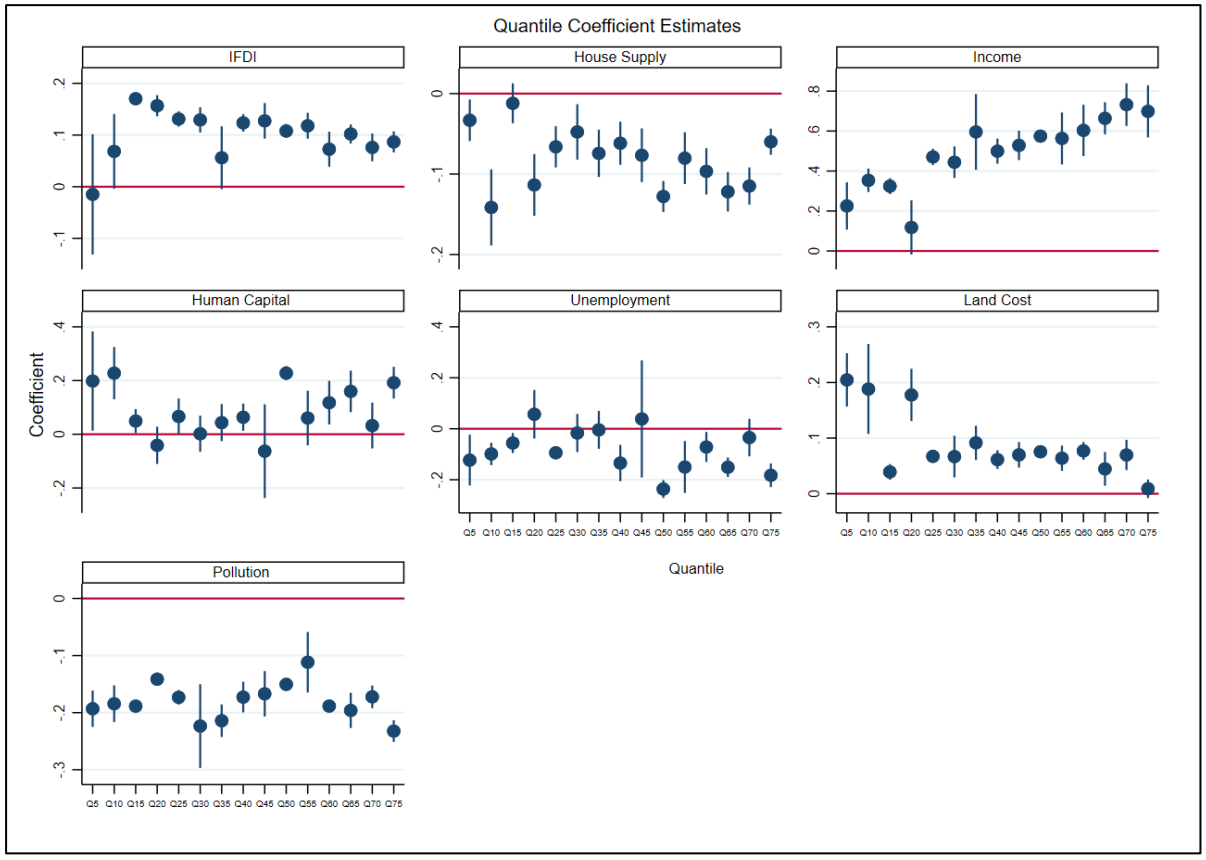
Max	7061	205601.3	24412	3.2	5.4	81.45	45.82
Obs	14	14	14	14	14	14	9
Qinghai							
Mean	5190.42	30172.75	15246.07	1.26	4.135	30.49	11.58
S.D	2258.70	16183.9	3923.22	0.29	0.430	25.69	1.88
Min	2108.64	15903.36	9000	0.86	3.1	1.56	7.62
Max	9215	54120.29	22618	1.9	4.7	97.49	13.45
Obs	14	14	14	14	14	14	9
Shaanxi							
Mean	6647.92	304102	16857.07	25.77	21.87	229.79	59.641
S.D	2309.63	249285.8	4432.91	4.78	1.290	230.74	19.14
Min	3358.82	95140.98	9268	16.23	19.5	54.31	32.89
Max	10993	837918	24666	32.13	24.1	760.42	83.17
Obs	14	14	14	14	14	14	9
Shandong							
Mean	7071.77	1381878	21718.43	46.54	45.51	806.80	148.93
S.D	1941.52	900981	5616.66	8.59	4.52	466.43	22.99
Min	3929.028	702946.8	12192	26.84	42.2	216.51	109.33
Max	10258.04	3975306	31597	58.59	60.7	1848.66	179.03
Obs	14	14	14	14	14	14	9
Shanghai							
Mean	25318.97	3442319	42356.07	12.95	25.07	780.65	29.02
S.D	12937.56	1621530	15446.52	0.77	2.88	637.47	10.45
Min	8937	1798010	20668	11.05	19.3	94.03	15.16

Max	48464.5	6599090	69442	13.9	27.9	1963.51	43.54
Obs	14	14	14	14	14	14	9
Shanxi							
Mean	5775.93	234127.2	16978	17.09	21.64	148.35	94.38
S.D	2452.16	114150.4	4008.146	3.23	3.54	114.89	25.79
Min	2689.27	88505.16	10028	10.84	15.6	23.98	57.63
Max	9580.61	484526.5	23828	21.66	26.5	446.05	128.6
Obs	14	14	14	14	14	14	9
Sichuan							
Mean	7002.13	559859	16738.57	30.85	44.62	680.08	58.87
S.D	1824.83	456931	4386.16	6.91	8.91	455.18	8.24
Min	3323.14	158671.4	9350	17.33	34.5	221.22	45.1
Max	10099	1996938	24703	40.29	56.3	1780.39	67.49
Obs	14	14	14	14	14	14	9
Tianjin							
Mean	10911.65	1057509	27985.21	11.67	20.30	369.17	23.05
S.D	3463.32	534290.3	8461.36	1.88	5.244	415.68	9.59
Min	5400.79	546977.9	14283	8.2	11.7	68.23	11.42
Max	16545	2145358	42404	13.92	26.1	1294.08	35.89
Obs	14	14	14	14	14	14	9
Xinjiang							
Mean	4447.18	58772.2	15608	6.56	10.85	76.731	69.07
S.D	1526.78	44030.74	4246.18	1.21	1.09	74.37	16.95
Min	2213.79	20730.94	8871	4.42	8.4	16.2	35.14

Max	6792.23	166651	23103	8.44	11.9	274.08	88.69
Obs	14	14	14	14	14	14	9
Yunnan							
Mean	4573.25	184477.4	15983.07	12.52	17.68	312.47	46.85
S.D	1686.61	109980.5	3667.61	4.32	2.81	263.24	6.92
Min	2714.26	85315.79	10070	6.36	13.8	43.4	32.88
Max	7639	463545.7	22082	19.65	22.9	977.74	54.85
Obs	14	14	14	14	14	14	9
Zhejiang							
Mean	11851.48	1730695	32381.5	24.02	32.26	2220.82	60.60
S.D	3532.34	763250.5	9447.08	3.70	1.92	1656.39	18.12
Min	5820.78	1002261	18265	16.25	28.6	428.98	38.04
Max	18019	3458980	49899	28.34	34.4	5597.85	85.91
Obs	14	14	14	14	14	14	9

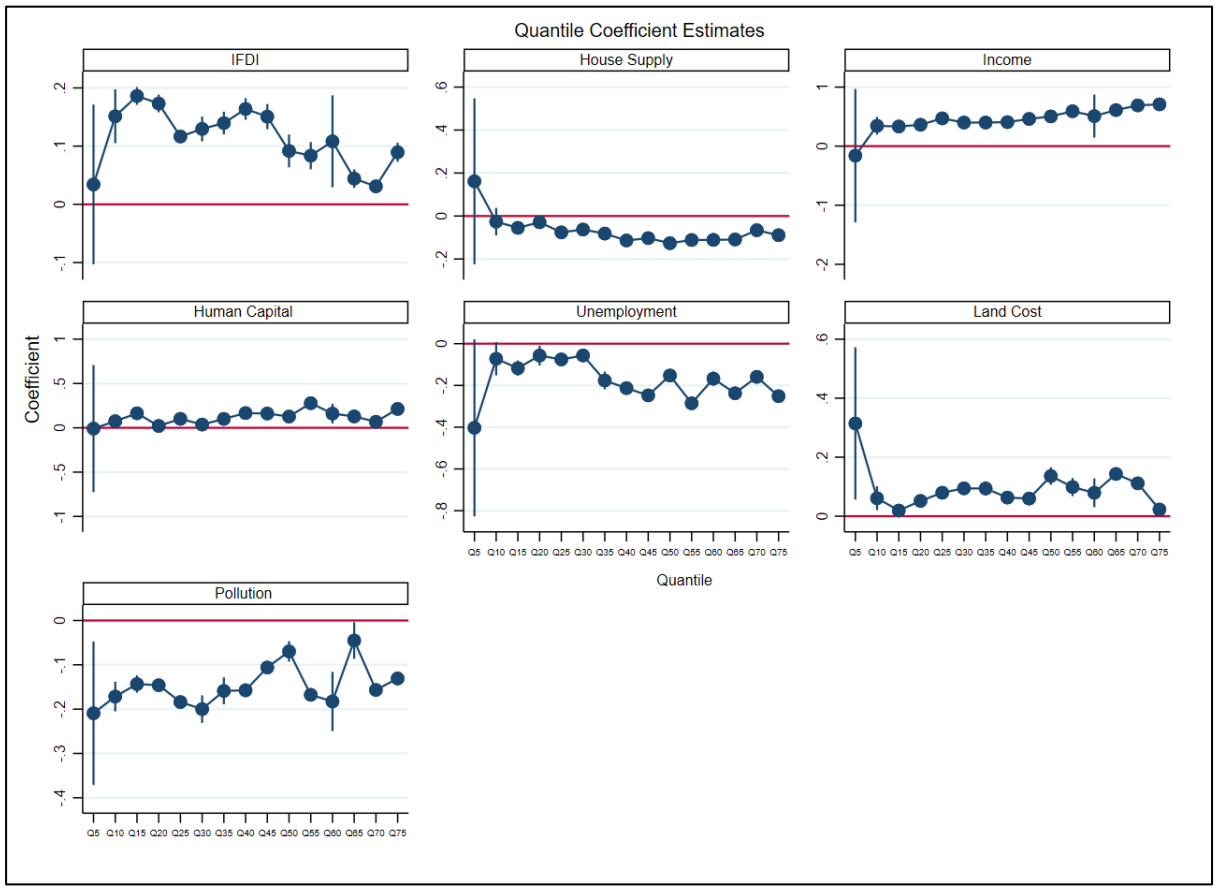
Appendix D Quantile Coefficient Estimate, 2011 – 2019

Appendix E displays the coefficient of the panel quantile estimation (including pollution). The Y-axis represents the 5th to the 75th quantile, while the Y-axis shows the coefficient estimation in Table 5.5. The red horizontal line represents the 95% confidence interval.



Appendix E Quantile Coefficient Estimates – First Order lags Instrumental variables, 2011- 2019

Appendix F displays the coefficient of the panel quantile estimation with first-order lags of the explanatory variables (including pollution). The Y-axis represents the 5th to the 75th quantile, while the Y-axis shows the coefficient estimation in Table 5.7. The red horizontal line represents the 95% confidence interval.



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