TO WHAT EXTENT DO INVESTMENT BARRIERS INFLUENCE FDI FLOW INTO CHINA?

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The People's Republic of China has recently experienced an incredible rise in FDI inflow despite being totally closed to foreign investors as recently as 1979. Despite this increase, several investment barriers into China persist. Many different authors have empirically investigated the determinants of FDI into developing countries. However, this study employs a panel data method to analyse the relationship between investment barriers and FDI inflows in the time between 2006 and 2014 from a sample of 83 countries. This is done in conjunction with other explanatory variables, namely: GDP, human capital investment, investment in infrastructure, Corporate Tax rate and Real Effective Exchange Rate. This study finds that investment barriers have a negative but statistically insignificant effect on FDI inflows into China.

1. Introduction

In 2014, the People's Republic of China (hereafter China) hosted the largest volume of inward Foreign Direct Investment (FDI) (UNCTAD, 2015). This is remarkable in itself, but is made even more so when one considers that foreign investors have only been permitted to participate in the Chinese economy for less than 4 decades. The meteoric rise of China as a host for FDI makes it an interesting topic of study, especially considering that FDI can act as a vehicle for economic growth (Zhao, 2013). It can be seen that the initial decision to allow foreign investment in the late 1970s was the single biggest catalyst in putting China on the path of becoming the greatest destination for foreign investment today (Coughlin & Segev, 2000). However, the extent of the effect government policy decisions have on FDI into the country is less obvious in recent times as the liberalisation of the Chinese market has progressed. Hence there is value in empirically evaluating the extent to which further opening of the Chinese economy serves to influence inward FDI into China.

Firstly, it is necessary to highlight the nature of investment barriers that exist in China today. A review of the literature reveals that opaque approval processes, barriers to market access, lack of access to recourse for disputes and the favouring of domestic competitors present the most significant types of investment barriers to foreign investors. In turn, it is also important to consider the recognised factors that are known to contribute to FDI. As there is no theoretical framework that outlines this factor (Demirhan & Masca, 2008), the existing studies of FDI determinants have tended to be empirical in nature. In reviewing the literature it can be found that market size and growth rate, characteristics of the labour force, quality of infrastructure, tax regimes and currency valuation are the most often considered when evaluating FDI determinants.

The aim of this paper is to empirically evaluate the nature and extent of the effect of investment barriers on FDI flow into China. In order to do so, a panel data fixed effects model will be employed to estimate the effect of investment barriers on FDI in conjunction with several other explanatory variables, namely: GDP, Human Capital Investment, investment in infrastructure, Real Effective Exchange Rate (REER) and Corporate Tax rate. In addition, a time lag of one year will be included. Several studies have sought to uncover the underlying factors that contribute to FDI, including for the specific case of China, as this paper aims to do. However, none have done so by evaluating FDI flows in the time period of 2006-2014 as this paper aims to do, or have explicitly investigated the effect of investment barriers in this context. Hence this paper presents a novel approach to evaluating this topic.

The conclusions found in this study are that the significant determinants of FDI into China over this time period are GDP and Infrastructure- each with positive effects- and REER with a negative effect.

The instrumental variable of investment barriers is found to have a negative but statistically insignificant effect. However, the high degree of collinearity between several variables presents a limitation to the inferences that can be drawn from these results. In addition, significant time effects are found to be present. Hence, I would not totally conclude that investment barriers have no effect on FDI flows.

2. Institutional background

As a result of the political environment of the cold war era, investment relationships between mainland China and the rest of the world (particularly Western powers) were virtually non-existent. It was not until the 'Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment' was passed in 1979 that foreign investors were first allowed to participate in the Chinese economy within specifically formed special economic zones, (Coughlin & Segev, 2000). One view of the motivation behind this decision is the Communist Party of China's (CCP) aim to legitimise their rule by delivering economic development and improving standards of living in a time where the Maoist ideology was losing its appeal (Casarini, 2006). Whether this is the case or not, it is clear that the CCP came to recognise that the benefits that could be delivered by allowing foreign investment outweighed the ideological reasons for maintaining a closed border.

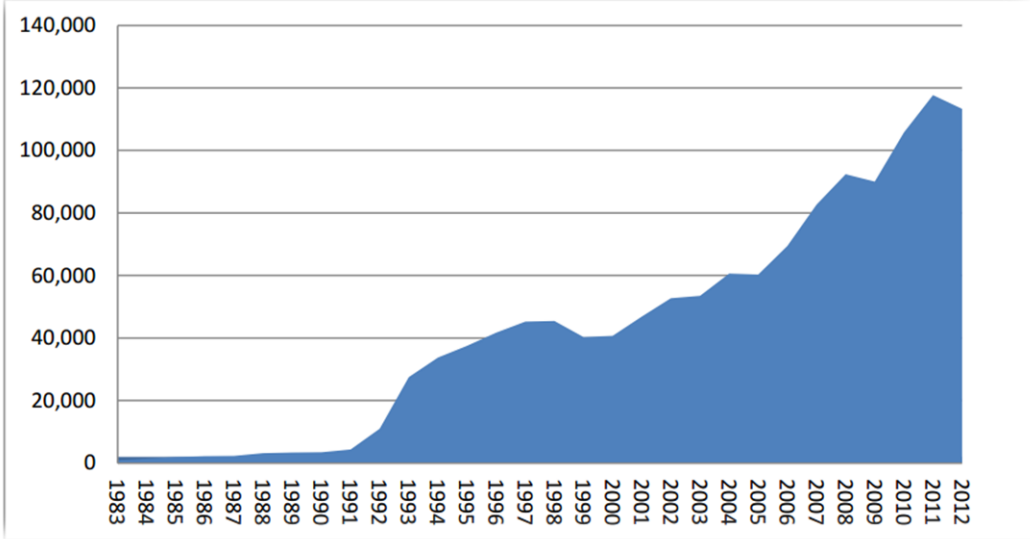
China's 2001 World Trade Organisation (WTO) accession can be seen as another major catalyst in changing the way foreign investment was received in the country. Initially, entirely foreign owned companies were not allowed, and as such, foreign investment had to take the form of joint equity ventures (unless they exported the majority of their products or utilised advanced technology and equipment) (Guoqiang, 2005). In addition to this, enterprises with foreign ownership were required to meet performance requirements such as technology transfers and the establishment of Research and Development centres (Guoqiang, 2005). However, as part of the conditions of its inclusion in the WTO, the Chinese government was required to implement changes in policies that were viewed to be inconsistent with WTO rules, such as the aforementioned restrictions, and this allowed for wholly foreign owned enterprises to be established in the country (Blancher & Rumbaugh, 2004).

Although investment in specific sectors remains prohibited or restricted for foreign investors, the trend of opening up the Chinese economy has continued. Policies in recent times have also aimed to further the decentralisation of FDI administration such that it can be carried out on the provincial level (Davies , 2013). One such change was outlined in a 2011 circular by the Ministry of Commerce of the People's Republic of China (MOFCOM) removing the need for additional application processes when establishing a branch of a foreign enterprise that is not subject to any special requirements (Davies ,

2013). Such changes serve to indicate that the CCP is still implementing policy changes with the aim of decreasing investment barriers into the country and promoting FDI inflow. The government also released a State Council circular in 2010 reiterating its aim to use foreign investment to boost technological innovation and promote development in poorer regions of the country that have not equally benefited from China's recent economic growth (Davies , 2013).

However, while great progress has been made in approving inbound foreign investment, there are still some issues raised with regards to this process. A report by the U.S Chamber of Commerce (2012) highlighted that the opaque approval processes can at times be used to selectively grant approval for investment on the condition of setting up joint ventures with selected Chinese partners and that in some cases, vaguely worded or unwritten rules are employed in order to preserve the competitiveness of local firms. Evidently, further changes would be needed to establish a fully open and transparent environment for inward FDI.

Figure 2.1: Annual FDI inflows to China, 1982-2012 (million US dollars)



Source(s): (Davies , 2013).

The importance of the role that FDI plays is widely recognised. Multinational Companies see it as a way to advance their corporate strategies and integrate their production processes across borders, while host countries view it as a way to advance their economic development and facilitate the spread of technology (Guoqiang, 2005). Following its policy Changes, China has become an economic giant of both outward and inward FDI. In fact, China hosted the largest volume of inward FDI in 2014 at 129 billion US dollars while also ranking third globally for outward FDI flows at 116 billion US dollars, (UNCTAD, 2015). The exponential increase of foreign investment flows into China is illustrated in Figure 2.1.

That the flow of foreign investment into China has seen incredible rates of growth over the past 4 decades is undeniable. The CCP's focus in using foreign capital as a vehicle for economic growth lends importance to understanding how policy changes can influence the use of FDI in the country as compared to other economic factors. Several works have been put forward that aim to understand how different factors contribute to the growth of FDI into a country.

3. Literature review

3.1 Investment barriers into China

Given the strength of the influence the government has historically had over the market in China, it may be the case that there exists a greater level of investment barriers. Although much has been done to address these since the beginning of the opening up policy, several barriers still exist. The European Chamber of Commerce in China publishes annual position papers compiled by conducting forums with European companies currently operating in China. The perception given here is that the objective of opening up foreign investment in China has lost momentum and that protectionist policies persist (European Chamber of Commerce in China, 2015). Taking steps to reduce the prevalence of these barriers could have a significant positive effect on inward FDI.

3.2 Approval processes

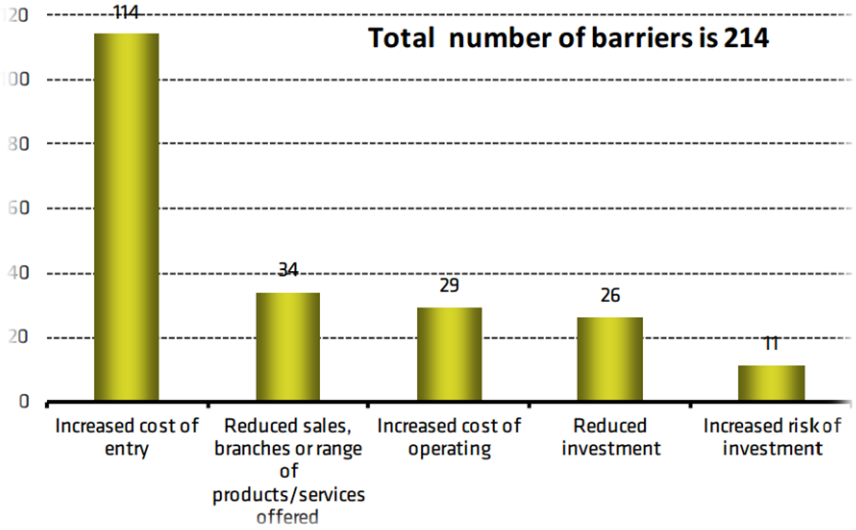
The inbound FDI approval process into China is described as opaque and at times discriminatory to foreign investors (U.S Chamber of Commerce, 2012). The first way in which this occurs is through authorities applying unwritten or vague requirements with the express intention of delaying the entry of a foreign company that is otherwise fully qualified (U.S Chamber of Commerce, 2012). The second way in which this may occur is the inclusion of conditions that are specific to the investment deal being considered (U.S Chamber of Commerce, 2012). This is often the case in industries where it is required for a foreign investor to enter the market with a local partner and authorities use their scope in the approval to ensure that intellectual property is made available to the local partner as a condition of approving the application (U.S Chamber of Commerce, 2012).

3.3 Market access

There still exist several barriers to market access for foreign investors. The most obvious of these would be the list of the remaining 139 sectors outlined by the Chinese government in which foreign investment is totally prohibited (Godement & Stanzel, 2015). In some sectors where foreign investment is allowed, it may be subject to additional requirements and restrictions such as the requirement to operate in a joint venture (Godement & Stanzel, 2015). Work by Francois, *et al*. (2012)

in compiling different investment barriers, such as licence procedures and capital requirements, found that the vast majority of these barriers increased the cost of market entry and served as a barrier to market access to foreign investors. The summary of their investment barrier inventory is illustrated in Figure 3.1.

Figure 3.1: Chinese investment barriers by number of times consequence is listed in investment barrier directory



Source(s): Francois *et al.* (2012)

It is further considered that barriers to market entry present the biggest challenge to Small and Medium size Enterprises (SMEs) who may lack access to the funds or influence needed to overcome them (Godement & Stanzel, 2015). In fact, the European Union is seeking to secure improved market access for European countries in its current Bilateral Investment Treaty (BIT) negotiations with China as they have identified this as a key area of difficulty (Francois, *et al.*, 2012).

3.4 Recourse for disputes

There is also perceived to be a lack of sufficient recourse to courts for foreign investors when attempting to solve disputes (Godement & Stanzel, 2015). Although recourse to local courts is permitted, foreign investors would prefer to avoid this route because the local courts will often serve the interests of local companies (Godement & Stanzel, 2015). In addition, the reasons for denying investment applications are very broadly defined, oral communication is predominantly used making it difficult to prove misconduct and there is reluctance to challenge authorities who have the power to affect the business' prospects (U.S Chamber of Commerce, 2012). The result is that hardly any foreign firms will attempt to use these channels which can leave approval authorities unrestricted to impose concessions on foreign firms or discriminate against them (U.S Chamber of Commerce, 2012). Pursuant to addressing this issue, another aim of the ongoing BIT negotiations between the EU and

China has also been to establish, “potential recourse to international arbitrators in a process known as investor-state dispute settlements,” (Godement & Stanzel, 2015). The fact that these negotiations are still ongoing indicates that there is still room for improvement in China’s administrative recourse policies in the eyes of foreign investors.

3.5 Favouring domestic competitors

Chinese government administrators are charged with making sure that inbound projects are in line with the country’s plans for economic and social development which explicitly includes encouraging and promoting domestic companies and brands (U.S Chamber of Commerce, 2012). This can prove problematic for foreign investors because the industrial policy of the region is shaped by this goal. One of the ways in which administrators pursue this aim is through selectively approving foreign projects on the condition that the investor acquiesces to a joint venture with a selected Chinese company (U.S Chamber of Commerce, 2012). Some investors have reported being required to transfer technology and provide access to international markets through the joint ventures (U.S Chamber of Commerce, 2012). This behaviour is not entirely surprising as there is evidence that both inward and outward FDI activity can affect the competitive advantage environment of the host economy (Dunning, 2002). Whether this effect is positive or negative largely depends on the specific circumstances. On one hand, multinational companies can easily shift value adding operations across borders in search of favourable conditions; on the other, governments enacting policies to attract such companies may be doing so to the detriment of local businesses (Dunning, 2002). However, although favouritism by officials may not be unfounded, it does present a barrier to foreign investors.

This is by no means an exhaustive list of the investment barriers that exist into China. It is also important to note that while larger companies may be able to overcome these barriers, smaller companies report finding it much more difficult to access the market and navigate the regulatory environment in China (Godement & Stanzel, 2015). Reducing investment barriers would thus likely open up the Chinese economy to different types of foreign investors who are currently completely blocked from the market.

Despite these barriers, China still remains an attractive destination for FDI. This is illustrated by the fact that although the GDP growth rate has been slowing down, China is becoming a more attractive destination for FDI with opportunities for foreign investors expected to grow in several sectors (KPMG Global China Practice, 2016). However, the concerns of foreign investors highlighted in this section show that the country may be able to benefit from addressing these barriers in order to further boost FDI inflow. In order to estimate the effect of the above-mentioned barriers on FDI inflow into China, it would be important to use a measure that most wholly includes these factors.

3.6 Factors influencing FDI

Zhao (2013) identifies reform and opening-up as the keys to China's economic success. This view is supported by the results of their panel data analysis in which it was found that FDI and privatisation significantly contributed to China's economic growth for the time period 1978-2008. The trend of privatisation – and by extension, decreased government intervention in market processes – is cited as, "an essential prelude," to the opening up of market transactions (Zhao, 2013). This paper serves to illustrate how important FDI has been as a vehicle for economic growth in China as well as the important interdependency between FDI and government policy.

Several empirical investigations seeking to explore the factors that contribute to FDI decisions, specifically in the case of developing economies, exist. Arita & Tanaka (2013) indicate that developing countries currently have greater barriers to inward foreign investment than their developed counterparts. They constructed a counterfactual policy experiment that served to show that decreasing such barriers (specifically the length and complexity of foreign investment procedures) would have a significant positive impact on individual firm decisions to participate in foreign investment. It is important to note here that the methodology used reflects a key difficulty in evaluating this topic. It is difficult to find a way to directly quantify the degree of government policy or intervention. Hence, there is difficulty in identifying suitable proxies for government policy or, similarly, investment barriers.

In addition to the factors that contribute to individual firms' foreign investment decisions, there is a wide range of literature seeking to identify and quantify the factors that influence inward FDI flow into a country as whole. However, Demirhan & Masca (2008) point out that this field lacks a consensus of the theoretical framework to explain FDI. Hence this issue can only be evaluated through the empirical works that have sought to quantify these variables. Bearing in mind the differences in investment environments between developed and developing economies as described by Arita & Tanaka (2013), I will only consider studies that focus on developing nations or on China itself as these are most likely to shed light on the variables most at play in the Chinese economy.

3.6.1 Market size and growth rate

The literature shows a consensus that the size of the market and the growth rate form two of the most important factors in determining FDI to developing countries (Ang, 2008; Rao, *et al*., 2010; Demirhan & Masca, 2008). GDP and GDP growth rates are used to quantify these. Ang (2008) suggests that the increased FDI linked to a larger domestic market size is as a result of the fact that a larger market size allows for the exploitation of economies of scale. Further, it is hypothesised that growth plays an important role in attracting FDI because faster growing economies present a better prospect for

generating profits (Demirhan & Masca, 2008). Even in the case where the effect of growth is empirically found to be mild, Ang (2008) emphasises that the evidence shows that the presence of strong economic growth was still important in attracting FDI. There is also evidence to suggest that, in fact, investors prefer growing economies to large economies (Demirhan & Masca, 2008). Both these factors are evidently at play in the Chinese economy which in addition to being one of the largest economies in the world with a 2014 GDP of over 10 trillion US dollars, also boasts a high growth rate growing at 7.3% in 2014 (World Bank, 2016).

3.6.2 Labour

Higher labour costs would be expected to negatively affect FDI inflows as it would increase potential costs (Rao, *et al*., 2010). However, the evidence concerning the nature and significance of wage rates to FDI delivers no consensus and varies from study to study (Demirhan & Masca, 2008). Demirhan & Masca (2008) find the effect of wage to be negative but statistically insignificant whereas Rao, *et al*. (2010) find it to be negative but significant. Other factors, such as the labour sensitivity of the intended sector, can influence the degree to which the wage rate influences FDI as well as the fact that using wage rates fails to control for productivity or changing exchange rates (Rao, *et al*., 2010). In an alternative treatment of this the labour variable, He & Sun (2014) include "human capital investment" in their model instead of wage rates. In this case, it was calculated by, "the ratio of secondary school enrolment (grades 7 to 12) to labour force," (He & Sun, 2014). Here they find the factor of human capital investment to be positive and statistically significant at the 5% level in contributing to FDI inflow into China for the time period 1995-2002. This could lead to the conclusion that the quality (or productivity) of labour available is also an important factor in determining FDI inflow.

3.6.3 Infrastructure

Poor infrastructure can present a significant challenge to business operations within a country and as such, is an important factor in determining FDI into a country (Demirhan & Masca, 2008). A further explanation to this is that a country that finds itself with the opportunity to attract FDI would be motivated to invest in improving its infrastructure leading to a strong relationship between the two (Demirhan & Masca, 2008; Rao, *et al*., 2010). This is reflected in the results found by Rao, *et al*. (2010), where infrastructure proved to be a positive statistically significant factor in determining FDI inflow into BRICS (Brazil, Russia, India, China and South Africa) countries for the time period 1975-2007. Demirhan & Masca (2008) also generated the same result in their cross-sectional analysis of developing countries. In terms of estimating this variable, Demirhan & Masca (2008) state that fixed telephone lines per 1,000 people is usually the standard measure. However, they go on to further

explain that it may only form an incomplete picture as it does not take into consideration the quality of the infrastructure or the prevalence of mobile telephones.

3.6.4 Tax

It is suggested that, "lowering corporate tax rate is an effective policy instrument to boost inward FDI," (Ang, 2008). Indeed, Ang (2008) finds tax to be a negative and significant factor in determining FDI into Malaysia. This result is mirrored by Demirhan & Masca (2008) in their cross-sectional analysis of developing countries; however, in their review they do note that the significance of this variable varies from study to study.

3.6.5 Currency value

REER (Real Effective Exchange Rate) is often used to evaluate relative currency value. Ang (2008) finds a statistically significant negative relationship between FDI and REER which he explains to be because a lower value of the domestic currency would increase foreign investors' relative wealth position and so lower their cost of capital. Rao*, et al*., (2010) find a similar result in their analysis of BRICS countries which lends credence to the view that currency valuation is indeed an important factor in determining FDI.

The factors considered here have each been reviewed in different studies, with some being found to be significant in certain cases and insignificant in others. Specifically, "labour costs, trade barriers, trade balance, exchange rate and tax have been found to have both negative and positive effects on FDI," (Demirhan & Masca, 2008). Consequently, there exists no accepted "true" set of determinants of FDI. Even within the studies considered here, none of the authors specified the exact same set of explanatory variables in their model. In addition, although the various studies have sought to uncover the underlying factors that contribute to FDI (and some even in the case of China itself), none have done so for the FDI flows in the time period of 2006-2014 as this paper aims to do, or for the range of countries considered in this case. Finally, none of the preceding works have sought to explicitly investigate the effect of investment barriers in this context. Hence, this paper provides a novel approach to the question of the determinants of FDI.

4. Methodology

4.1 Dataset

This empirical investigation will consist of a panel data sample of inward FDI flows into China from 83 countries for the time period 2006-2014. These will be lagged to be modelled against dependent variables for the time period 2005-2013 for a total of 747 observations. All global regions are included

in the sample used in this investigation. Hence, I believe it to be a representative sample. The time period chosen reflects the availability of data. Firstly, the most recent FDI figures separated by country of origin are for 2014. Secondly, the chosen proxy for investment barriers limits our earliest observation to 2005 (as will be discussed later in the next chapter). Table 4.1 shows the summary statistics for the variables used in this investigation.

Table 4.1: Variable Summary Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum
FDI (in 100 000 US dollars, deflated to year 2000)	774	4,040	0.34823	47,200
GDP (in 100 000 US dollars, deflated to year 2000)	3,200,000	1,400,000	1,320,000	5,510,000
Economic Freedom Index	6.084	0.105	5.870	6.250
Human Capital Investment factor	0.109	0.003	0.0103	0.115
REER	98.078	9.806	84.3	115.3
Infrastructure Investment factor	0.138	0.0174	0.116	0.166
Corporate tax rate (%)	27.67	3.773	25	33
log(FDI)	17.113	2.747	10.458	24.577
log(GDP)	28.689	0.473	27.906	29.337
N	747			

In addition, Table 4.2 shows the correlations between the variables used in the model.

Table 4.2: Variable Correlation matrix

	log(FDI)	log(GDP)	Economic Freedom Index	Human Capital Investment factor	REER	Infrastructure Investment factor	Corporate tax rate
log(FDI)	1						
log(GDP)	-0.0614	1					
Economic Freedom Index	-0.0605	0.926	1				
Human capital investment factor	0.0523	-0.916	-0.910	1			
REER	-0.0691	0.971	0.916	-0.919	1		
Infrastructure investment factor	-0.0430	0.741	0.685	-0.789	0.816	1	
Corporate tax rate	0.0434	-0.860	-0.703	0.839	-0.852	-0.777	1

The sources, construction and determination of each of these variables will be further discussed in this chapter.

4.2 Dependent variable

The dependent variable in this case is FDI inflow into China. The aim is to evaluate the extent of the impact of investment barriers on this figure. The FDI figure for each country was sourced from the National Bureau of Statistics of China (NBS). It is specified as:

> "*Investment in China through the establishment of foreign invested enterprises… and the establishment of branch organizations of foreign enterprises. [It] can be made in forms of cash, physical investment, technical know-how and reinvestment of the foreign enterprises with the profits gained from the investment.*" (National Bureau of Statistics of China, 2014).

Although the inclusion of subjective values such as technical know-how may impact the reliability of this figure, I still consider this an appropriate measure as it most wholly encapsulates the degree of interaction between countries by considering additional forms that foreign investment can take. In order to convert this figure in to real terms and allow for comparisons over time, the figure stated by the NBS will be divided by the GDP deflator obtained from the World Bank's World Development Indicators (WDI) dataset with a base year of 2000. Hence the determination of the FDI figures used in the model will be as shown in Equation 1.

Equation 1:

$$FDI = \frac{FDI\ in\ US\ dollars}{GDP\ Deflator}$$

The GDP deflator is the most appropriate measure of inflation to use as it looks at the economy as a whole rather than reflecting price changes relative to a "basket of goods" which may be subject to change (World Bank, 2016).

4.3 Independent Variables

Although the primary aim of this investigation is to evaluate the extent to which investment barriers affect FDI inflow into China, it is also necessary to include other explanatory variables in order to avoid omitted variable bias (Gujarati & Porter, 2009). The independent variables in this specification have been chosen carefully based on their potential significance as reflected in the reviewed literature.

There is a consensus among the literature that GDP is an important determining factor for FDI. Hence, I expect it to have a significant positive effect. The GDP figures used in this investigation are sourced from World Bank data. This is given in current USD dollars. In order to convert this figure to a comparable level to that used for FDI, the GDP figures will be deflated using the most recent GDP deflator to convert them to a real GDP level for the base year 2000. Hence, the determination of GDP is summarised by Equation 2.

Equation 2:

$$\mathrm{GDP} = \frac{GDP\ in\ current\ US\ dollars}{2014\ GDP\ deflator}$$

There is no conviction within the literature as to the nature of the effect of Corporate Tax rates on FDI. I expect it to have a negative effect and insignificant effect in this case. The data used for this is sourced from the Trading Economics website and is reported in percentages which are transferred directly into the dataset for the time period in question. On the other hand, the literature reviewed confirmed a negative and significant effect of REER on FDI. I expect to find the same. REER is calculated as the nominal exchange rate (weighted against several foreign currencies) divided by a deflator and for this study is sourced from World Banks WDI data (World Bank, 2016).

For the purposes of this investigation, I will construct a factor reflecting investment in human capital in China. The aim here is to construct a proxy for the quality of labour available by gauging the extent to which there is investment in educating the labour force. As discussed by Rao*, et al*. (2010), simply using wage rates fails to control for factors including productivity and changing exchange rates (a

factor which has already been included in this model). As such, the method used to determine this Human Capital Investment factor is that which He & Sun (2014) use. To reflect the investment in education, the number of new students enrolling in senior secondary school is considered. This is then given as a proportion of the number of economically active persons to provide an indication of the investment in education relative to the size of China's labour force. Both of these figures are obtained from the NBS. I expect this to have a positive and statistically significant effect.

Telephone lines per 1000 people as often considered as the standard indicator for infrastructure (Demirhan & Masca, 2008). However, Demirhan & Masca (2008) point out the weaknesses of this measure as it fails to account for mobile technology. This must only be more so the case considering that mobile technology has progressed further since the time of publication. Hence I will use an Infrastructure Investment factor to indicate the extent to which the government in China is investing in improving infrastructure. This factor will be constructed as shown in equation 3.

Equation 3:

$$Infrastrucutre\ Investment\ Factor = \frac{State\ Budget\ on\ Fixed\ Assets\ (in\ Yuan)}{Total\ Government\ Expenditure\ (in\ Yuan)}$$

The figures for both of these are sourced from the NBS. I expect this factor to have a positive and significant effect on FDI. A limitation of using this measure is that it is impossible to determine the proportion of the Fixed Assets budget that is used in improving infrastructures that would be relevant to foreign investors (for example roads). However, World Bank data for telephone lines per 100 people in China shows a decreasing trend over recent years which I take to reflect the shift to mobile telephones rather than a deterioration in infrastructure (World Bank, 2016). Hence, I believe judging infrastructure by the proportion of government expenditure on fixed assets would be more valid than using the standard measure.

4.4 Investment Barriers

The instrumental variable that this investigation seeks to evaluate is that of investment barriers. However, there is difficulty in considering this factor as it is neither explicitly observable nor directly quantifiable. In the case of China, the main manifestations of barriers to investment include barriers to approval, market access, access to recourse for dispute and equal treatment of foreign entities as discussed earlier. A good proxy for this factor would need to take these into consideration and adequately weight them to create an accurate evaluation of the degree of investment barriers as well as an accurate reflection of the changes in these.

To this end, this study will use the Economic Freedom of the World Index as a proxy for investment barriers. This Index creates a score for each country on a scale of 1-10 where a higher score indicates a higher degree of economic freedom (Gwartney, *et al*., 2015). As such, a higher value will indicate a lower level of investment barriers. The full set of variables considered in the construction of this index is listed in Appendix 1. However, the main categories that are investigated are: size of government, legal system and property rights, soundness of money, freedom to trade internationally and the regulatory environment (Gwartney, *et al*., 2015). This index especially forms a good proxy in this case as it includes indicators for each of the forms of investment barriers that were identified as the most prevalent earlier in this paper. For instance, it takes into account favouritism and the enforcement of legal contracts.

It is also important to note that the index numbers used have been chain-linked for the time period in question making them more accurate indicators of changes in investment barriers relative to the previous time period (Gwartney, *et al*., 2015). This further serves to make this an appropriate indicator when evaluating relative changes in investment barriers over time.

To construct the Economic Freedom Index variable, the figures provided in this index are directly transferred to the dataset.

4.5 Model Specification

The FDI flow is lagged by one year against the explanatory variables resulting in a model as shown in equation 4.

Equation 4:

$$\begin{aligned}\log(FDI_{it+1}) = {} & \beta_1 \log(GDP_{it}) + \beta_2 Economic\ Freedom\ Index_{it} \\ & + \beta_3 Human\ Capital\ Investment\ Factor_{it} + \beta_4 REER_{it} \\ & + \beta_5 Infrastructure\ Investment\ Factor_{it} + \beta_6 Corporate\ Tax\ Rate_{it} + \mu\end{aligned}$$

Where *i* is each foreign country investing in China, *t* is the specific year in the time period 2005-2013 and μ is the error term.

As this is a panel data study, the models used for estimation will be the Pooled Ordinary Least Squares (OLS) model, Fixed Effects Model (FEM) and Random Effects Model (REM). Although the literature reviewed did not include a study that specifically considered this variable, I expect to find a positive relationship between the Economic Freedom Index and FDI. This is because a higher Freedom Index would indicate a lower degree of investment barriers into China which I would expect to be linked

with higher FDI inflows. However, I do not expect the coefficient of this variable to be statistically significant.

5. Results

To begin, all models were estimated while controlling for time effects. A joint significance test of the year effects was then conducted for each of the models. The results indicated that year effects were not significant in the Pooled and REM models. As such, the results reported under these are for models that do not control for year. However, this was not the case for the FEM model which indicated that time effects were significant. Hence a model controlling for time effects is shown in FEM1 while FEM2 shows the model where time effects are not controlled for. In addition, robust estimators were used in all models in order to allow for potential heteroskedasticity (Gujarati & Porter, 2009). These results under each of these models are summarised in Table 5.1 below.

Table 5.1: Table of results

Independent Variables	**OLS** $\log(FDI)_{t+1}$	**REM** $\log(FDI)_{t+1}$	**FEM$_1$** $\log(FDI)_{t+1}$	**FEM$_2$** $\log(FDI)_{t+1}$
log(GDP)	0.650	0.650	x	0.650
	(0.53)	(1.68)		(1.68)
				[0.096]
Economic Freedom Index	0.305	0.305	x	0.305
	(0.08)	(0.32)		(0.32)
				[0.747]
Human Capital Investment Factor	-224.9	-224.9	x	-224.9
	(-0.23)	(-1.02)		(-1.02)
				[0.309]
REER	-0.0776	-0.0776***	-0.0303***	-0.0776***
	(-1.34)	(-5.35)	(-3.55)	(-5.35)
			[0.001]	[0.000]
Infrastructure Investment Factor	7.855	7.855*	x	7.855*
	(0.64)	(2.44)		(2.44)
				[0.017]
Corporate Tax Rate	-0.0188	-0.0188	-0.0310	-0.0188
	(-0.25)	(-0.78)	(-1.25)	(-0.78)
			[0.216]	[0.440]
Year 2005			x	

Year 2006			0.0538 (0.66) [0.513]	
Year 2007			0.221 (1.91) [0.059]	
Year 2008			x	
Year 2009			0.242* (2.43) [0.017]	
Year 2010			0.243* (2.22) [0.029]	
Year 2011			0.0930 (0.88) [0.382]	
Year 2012			0.183 (1.82) [0.072]	
Year 2013			x	
Constant	6.121 (0.17)	6.121 (0.64)	20.82*** (14.28)	6.121 (0.64)
N	747	747	747	747
***F* statistic**	0.74		5.65	6.34
Probability > *F*	0.6137		0.0000	0.0000
Probability > χ^2		0.0000		

Notes: *t* statistics are shown in round parentheses "( )"
P values are shown in square parentheses "[ ]"
x indicates a variable was omitted for collinearity
* indicates statistical significance at a 5% significance level,
** indicates statistical significance at a 1% significance level
*** indicates statistical significance at a 0.1% significance level

The first regression is performed using the pooled model. However, a performance of the Breusch-Pagan test reveals that the REM would be better in evaluating this model. This fact is corroborated by the fact that the F statistic under the pooled model suggests that the joint effect of the coefficients is not statistically different from 0. I then conducted a Hausman test to evaluate the merits of the REM

as compared to the FEM. The results indicate strong evidence that the difference in coefficients is systematic hence the FEM is a more appropriate model to use in this case.

However, a key difficulty at this stage is that the instrumental variable, Economic Freedom Index, is omitted as a result of collinearity when time effects are controlled for. The dependency of this variable is evaluated by regressing it against the other explanatory variables. The result is the dependency equation for Economic Freedom as shown in Equation 5 which also yielded an R2 value of 0.9340.

Equation 5:

$$\begin{aligned} &Economic\ Freedom\ Index \\ &\quad = 0.147[log(GDP)] - 153(Human\ Capital\ Investment\ Factor) \\ &\quad + 0.00239(REER) + 0.0126(Corporate\ Tax\ Rate) + 2.991 \end{aligned}$$

Several other key variables are also omitted under FEM1, this makes it impossible to evaluate the effect that they each may have. Hence, despite the presence of time effects, I opted to estimate FEM2 under which time effects are not controlled for and evaluate the variables resulting from this. As such, it is essential interpret these results in the context that average log(FDI) figures fluctuated over time, and that this effect has not be controlled for. This will influence the accuracy of the results in describing the true degree of the effect each variable will have on FDI.

The relationship between log(FDI) and log(GDP) is found to be positive which is as expected. The P-value for log(GDP) under the FEM2 was 0.096 showing that it is statistically significant at the 10% level. Although both this directionality and statistical significance was the expected result, I had anticipated significance would be at the under the 5% level. Especially considering that GDP is widely considered the most robust determinant of FDI (Demirhan & Masca, 2008).

There is a positive relationship between the Economic Freedom Index and log(FDI). However, with a P-value of 0.747, this coefficient is not statistically significant. This finding matches my expectations. The effect of the Infrastructure Investment Factor is both positive and statistically significant at the 5% level. This result is as expected and serves to reiterate the importance that infrastructure can have to foreign investors.

The relationship between the Human Capital Investment factor and log(FDI) emerges as negative but statistically insignificant. The directionality of this relationship is highly surprising and is also in contrast with the findings of He & Sun (2014). However, I would not infer a negative relationship between FDI and Human Capital Investment from this result. I suspect rather an underlying relationship between FDI and the variables used to construct this proxy or the model specification used are likely the cause of this finding.

In this model, Corporate Tax Rate has a negative but statistically insignificant effect which is as expected. Though tax has been found significant in some instances of the literature, this finding is consistent with the observation made by Demirhan & Masca (2008) that there is no consensus on whether this variable is significant. Whereas REER also displayed a negative relationship, it is found to be statistically significant. As in the case of tax rate, this is not a surprising result. The explanation provided by Ang (2008) in the case of Malaysia could appropriately be used here as well. Clearly, lower exchange rates are attractive to foreign investors as it represents a higher relative wealth position for them.

Although FEM1 does not allow us to evaluate our explanatory variables, it does offer insight into the time effects in the data. All the included time periods had a positive effect on log(FDI) with 2000 and 2010 being significant at a 5% level and 2007 and 2012 being significant at a 10% level.

When estimating a fixed effects model using the "xtreg" command in Stata software, the reported R2 figures are not accurate (Torres-Reyna, 2007). To determine the accurate figure, I estimated fixed effects using the "areg" command instead (Torres-Reyna, 2007). This resulted in an R2 of 0.9273 indicating that 92.73% of the variation in the dependent variable is explained by the explanatory variables. This is a very high goodness of fit.

Overall, the significant determinants of FDI into China over this time period are found to be GDP and Infrastructure with a positive effect, and REER with a negative effect. Corporate tax rate is found to have a negative and statistically insignificant result. As the Economic Freedom Index is found to have a positive (but statistically insignificant) effect, it can be inferred that a higher degree of investment barriers would have a negative but statistically insignificant effect as well. This result is as anticipated. There are also significant time effects that affect FDI flow. However, a big caveat to these results stems from the high degree of collinearity between several variables. This limitation will be further discussed in the next chapter.

6. Limitations

The first limitation was on the time period over which this analysis could take place. This is because the measure used for the instrumental variable (the Economic Freedom of the World Index) only included a chain linked series of this measure for the time period of 2005-2013. This restricted the time period to nine years. Being able to conduct this estimation with a longer time period may have helped generate more valid results. In addition, this analysis was based on a one year time lag between changes in the investment environment in China and the resulting changes in FDI. This decision was made to account for the time between when the changes that may motivate a foreign investor occur

and the time for that investment to be realised. However, I could not find concrete data on exactly how long this time lag generally is as it seems to vary greatly from case to case. Hence it was necessary to simply assume that one year is the case on average. However, there was no way to determine if this was true.

The high correlation between explanatory variables was highly problematic. The extent of this is fully shown in Table 4.2. The core problems that arise as a result of collinearity are larger standard errors leading to more explanatory variables emerging as statistically insignificant even in the case that the model as a whole has a high R2 value (Belsley, 1991; Gujarati & Porter, 2009). In other words it results in Type II error and mistaking significant variables to be insignificant. Secondly, collinearity can significantly undermine the stability of the estimators such that even small changes in the inputs can result in large changes in the coefficients and even changing signs (Belsley, 1991). Both of this cases are evident in the results of this study which resulted in difficulties specifying the correct model and accurately interpreting the results. This can explain the surprising directionality of the coefficient for the Human Capital Investment factor. It was especially problematic when attempting to control for time effects as it led to several important variables being omitted. A solution to this can be presented by constructing a model in which the highly correlated variables are excluded (Ho, 2004). However, when using the fixed effects model while controlling for time effects, there was no iteration of the model that did not result in the instrumental variable of Economic Freedom being omitted- not even in the case where it was the sole explanatory variable. Taking this limitation into consideration, it may be the case that more factors would have been statistically significant than the results would suggest.

It is also the case that the reason for high correlation between some of the variables (for instance Human Capital Investment and REER) is not immediately clear which may suggest the presence of an unobserved "lurking" variable or reverse causality between some variables; in other words, some degree of endogeneity is likely present (Antonakis, *et al*., 2014). The problem of potential endogeneity of variables may be solved by conducting a Generalised Methods of Moments (GMM) analysis rather than an FEM (Hall, 2005). As such, I conducted an instrumental variable regression using the GMM model to control for endogeneity- the results of which can be seen in Appendix 2. However, this model did not generate significant coefficients and so was excluded from my final results.

In addition to the issues that arose in analysing the time-variant variables, there may also exist significant time-invariant variables. For instance, although GDP and FDI may fluctuate from year to year, the distance between countries would remain the same (Davies, *et al*., 2008). The Fixed Effects model cannot account for these. A potential solution to this could be using the panel fixed effects with vector decomposition (XTFEVD) method which, "removes biases induced by the correlation between

time varying variables and unobserved country characteristics," (Davies, *et al*., 2008). This is important because if an unobserved country characteristic is correlated with both an explanatory variable and the dependent variable, omitting it form the model results in over- or understated impacts of the explanatory variable on the dependent variable (depending on the directionality) (Davies, *et al*., 2008). This seems to well explain the issues that arose in this analysis. Thus this model may be able to generate more valid results.

It is possible that instability in the coefficients of the estimation has reduced their accuracy and that some of the variables that proved statistically insignificant are in fact important in determining FDI. Further analysis using models that can account for endogeneity and time-invariant variables would be needed to control for these additional factors and to further evaluate the relationships between these variables.

7. Conclusion

The aim of this paper was to empirically evaluate the nature and extent of the effect of investment barriers on FDI flow into China. There was value in analysing this topic given China's unique history with FDI and subsequent rapid rise in this respect. Firstly, the literature was reviewed to form an understanding of both the nature of investment barriers that exist into China and the determinants that are widely understood to influence FDI. As there is no agreed upon theoretical framework for FDI (Demirhan & Masca, 2008), the evaluation of recognised FDI determinants was based on reviewing empirical works that were conducted for regions that are similar to China.

In order to evaluate several entities over several time periods, panel data methods were used. The effect of investment barriers on FDI was evaluated in a lagged regression in conjunction with several other explanatory variables. This study found that the significant determinants of FDI into China over this time period are GDP and Infrastructure – each with a positive effects – and REER with a negative effect. Corporate Tax rate displayed a negative and insignificant effect. In most cases, these findings are in line with the findings of most of the literature reviewed (Ang, 2008; Rao, *et al*., 2010; Demirhan & Masca, 2008). The only contrasting result was that of Human Capital Investment which displayed an unexpected negative relationship (but was statistically insignificant).

With regards to my research question, the instrumental variable of investment barriers is found to have a negative but statistically insignificant effect. However, the high degree of collinearity between several variables presents a limitation to the inferences that can be drawn from these results. In addition, significant time effects are found to be present so the results of this study should be interpreted in this context. Taking into considering these limitations, I would not exclude the

importance of investment barriers on FDI. Particularly considering the very high correlation between variables as displayed in Table 4.2, the consequences associated with high collinearity and endogeneity must be considered when evaluating these results.

Allowing for these limitations, I would imagine that there is a scope for further analysis to determine the true empirical relationship between investment barriers and FDI inflow. Anecdotally, the concerns raised when evaluating the nature of investment barriers into China illustrated that their effects are still felt by foreign investors, particularly by smaller companies (Godement & Stanzel, 2015). Hence, although the size of this effect may not have been concretely determined, I would say that there would be some positive impact on FDI from reducing investment barriers.

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Appendix

Appendix 1: Economic Freedom of the World Index

China

	1980	1990	2000	2005	2010	2012	2013
	Rating (Rank)	Rating (Rank)	Rating (Rank)	Rating (Rank)	Rating (Rank)	Rating (Rank)	Rating (Rank)
Summary Ratings (Rank)	**3.64** (96)	**4.09** (100)	**5.75** (100)	**6.05** (105)	**6.26** (120)	**6.39** (113)	**6.44** (111)
	Rating *(Data)*	Rating *(Data)*	Rating *(Data)*	Rating *(Data)*	Rating *(Data)*	Rating *(Data)*	Rating *(Data)*
Area 1. Size of Government	**2.63**	**3.65**	**3.43**	**4.54**	**4.48**	**5.00**	**5.00**
A. Government consumption	5.25 *(22.14)*	5.94 *(19.81)*	4.28 *(25.46)*	3.87 *(26.84)*	3.63 *(27.66)*	3.71 *(27.40)*	3.71 *(27.40)*
B. Transfers and subsidies				8.29 *(6.76)*	8.29 *(6.76)*	8.29 *(6.76)*	8.29 *(6.76)*
C. Government enterprises and investment	0.00 *(56.40)*	0.00 *(61.90)*	0.00 *(77.97)*	0.00 *(69.77)*	0.00 *(50.91)*	2.00 *(46.07)*	2.00 *(46.07)*
D. Top marginal tax rate		5.00	6.00	6.00	6.00	6.00	6.00
(i) Top marginal income tax rate		5.00 *(45)*	6.00 *(45)*	6.00 *(45)*	6.00 *(45)*	6.00 *(45)*	6.00 *(45)*
(ii) Top marginal income and payroll tax rate					6.00 *(45)*	6.00 *(45)*	6.00 *(45)*
Area 2. Legal System and Property Rights		**5.79**	**4.95**	**5.60**	**6.25**	**6.00**	**5.86**
A. Judicial independence			3.34	3.92	4.89	5.01	4.98
B. Impartial courts			4.18	4.03	5.21	5.02	4.71
C. Protection of property rights			3.22	4.95	6.74	6.04	5.81
D. Military interference in rule of law and politics			7.34	5.00	5.00	5.00	5.00
E. Integrity of the legal system			6.67	7.50	6.67	5.83	5.83
F. Legal enforcement of contracts				6.73	6.73	6.73	6.07
G. Regulatory costs of the sale of real property				8.27	8.27	8.27	8.45
H. Reliability of police				5.08	5.95	5.69	5.50
I. Business costs of crime				4.92	6.77	6.38	6.34
Area 3. Sound Money	**6.18**	**6.73**	**8.12**	**8.18**	**7.89**	**8.03**	**8.26**
A. Money growth	6.00 *(20.00)*	9.18 *(4.09)*	8.90 *(5.48)*	9.05 *(4.76)*	8.57 *(7.14)*	9.15 *(4.26)*	9.98 *(0.08)*
B. Standard deviation of inflation	9.48 *(1.31)*	8.86 *(2.84)*	8.63 *(3.43)*	9.04 *(2.41)*	8.63 *(3.42)*	8.51 *(3.73)*	8.58 *(3.56)*
C. Inflation: most recent year	9.24 *(3.78)*	8.86 *(5.68)*	9.95 *(0.26)*	9.64 *(1.82)*	9.34 *(3.31)*	9.47 *(2.65)*	9.47 *(2.63)*
D. Freedom to own foreign currency bank accounts	0.00	0.00	5.00	5.00	5.00	5.00	5.00
Area 4. Freedom to Trade Internationally	**2.72**	**2.72**	**6.46**	**6.64**	**6.68**	**6.66**	**6.73**
A. Tariffs	3.15	3.16	7.11	7.96	8.13	8.13	8.10
(i) Revenue from trade taxes (% of trade sector)	6.20 *(5.70)*	7.53 *(3.70)*	8.86 *(1.71)*	8.81 *(1.78)*	9.35 *(0.98)*	9.33 *(1.00)*	9.33 *(1.00)*
(ii) Mean tariff rate	0.10 *(49.50)*	1.94 *(40.30)*	8.86 *(1.71)*	8.16 *(9.20)*	8.08 *(9.60)*	8.08 *(9.60)*	8.02 *(9.90)*
(iii) Standard deviation of tariff rates		0.00 *(32.10)*	5.72 *(10.70)*	6.91 *(7.72)*	6.97 *(7.58)*	6.97 *(7.58)*	6.95 *(7.62)*
B. Regulatory trade barriers			6.01	6.02	6.38	6.18	6.34
(i) Non-tariff trade barriers			4.35	5.14	5.86	5.46	5.77
(ii) Compliance costs of importing and exporting			7.66	6.91	6.91	6.91	6.91
C. Black-market exchange rates	5.00	0.00	10.00	10.00	10.00	10.00	10.00
D. Controls of the movement of capital and people	0.00	5.00	2.71	2.56	2.19	2.33	2.48
(i) Foreign ownership / investment restrictions			4.66	6.71	6.35	6.01	6.25
(ii) Capital controls	0.00	5.00	0.77	0.77	0.00	0.77	0.77
(iii) Freedom of foreigners to visit				0.20	0.22	0.22	0.42
Area 5. Regulation	**3.04**	**1.58**	**5.79**	**5.31**	**6.01**	**6.26**	**6.38**
A. Credit Market regulations	0.00	0.00	6.46	7.06	6.76	7.19	7.21
(i) Ownership of banks	0.00	0.00	0.00	2.00	2.00	2.00	2.00
(ii) Private sector credit			9.39	9.18	9.28	9.57	9.63
(iii) Interest rate controls (negative real interest rates)	0.00	0.00	10.00	10.00	9.00	10.00	10.00

(continued)

B. Labor Market regulations		3.16	4.66	4.98	5.66	5.58	5.63
(i) Hiring regulations and minimum wage			4.37	8.90	8.90	8.90	8.90
(ii) Hiring and firing regulations		4.30	5.10	5.27	5.45	5.70	5.98
(iii) Centralized collective bargaining	4.49	5.18	7.67	7.44	7.10	6.35	6.40
(iv) Hours regulations			6.18	6.70	10.00	10.00	10.00
(v) Mandated cost of worker dismissal				1.56	2.52	2.52	2.52
(vi) Conscription	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. Business regulations			6.25	3.88	5.61	6.02	6.29
(i) Administrative requirements			7.60	3.96	4.89	5.46	5.09
(ii) Bureaucracy costs			5.40	2.00	4.67	4.67	4.67
(iii) Starting a business			6.52	8.08	8.42	8.67	8.99
(iv) Extra payments / bribes / favoritism			5.49	5.52	5.11	4.99	4.99
(v) Licensing restrictions				3.52	5.04	5.89	6.92
(vi) Cost of tax compliance				0.23	5.54	6.44	7.07

Appendix 2: GMM estimation results

Independent Variables	**GMM log(FDI)$_{t+1}$**
log(GDP)	0.394
	(0.25)
	[0.799]
REER	-0.0493
	(-0.81)
	[0.420]
Human Capital Investment Factor	-597.5
	(-0.75)
	[0.455]
Economic Freedom Index	-0.759
	(-0.25)
	[0.799]
Constant	21.79
	(0.58)
	[0.562]
N	747
Probability > χ^2	0.4326

Notes: z statistics are shown in round parentheses "( )"
P values are shown in square parentheses "[ ]"

Instrumented variables: log(GDP), REER

Instruments: Human Capital Investment Factor, Economic Freedom Index, Corporate tax rate, Infrastructure Investment factor, year 2006, year 2007