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Inter-provincial income inequality and FDI in China

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Abstract: Income inequality in China is a topic widely discussed in the literature. So are globalization, and the continuous increase in the presence of foreign direct investment on the world market. This paper uses data from the Chinese statistical yearbooks, to conduct an empirical analysis, based on panel data, to research if there is a relationship between the increasing levels of inter-provincial inequality in China, and the presence of foreign direct investment. The results indicate that the presence of foreign direct investment do influence the provincial variations in income, as well as China's Gini coefficient, over the years of 1992 to 2010. These results points at, that the presence of foreign direct investment has a negative impact on the level of inter-provincial inequality in China.

Key words: China, inequality, FDI, province, panel data analysis

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List of Acronyms:

FDI = foreign direct investment

WTO = world trade organization

GDP = Gross domestic product

GNP = gross national product

MNE = multi national enterprise

TVE = township village enterprise

SEZ = Special economic zone

SOE = State owned enterprise

CCP = Chinese communist party

NPC= National People's congress

HDI = human development index

NBS = national bureau of statistics

1. Introduction

China, FDI (foreign direct investment) and inequality, three words that have been central to the global economic debate for decades, however, in recent years those three concepts have more and more frequently been linked together. Inequality has in the past years received an increased amount of focus on the world economic agenda, and growing differences between rich and poor was recently, at the 2014 World Economic Forum, mentioned as one of the largest threat to global economic growth (Kennedy, 2014).

If inequality is a threat to the global economy, China's level of inequality should be of interest to all of us. As currently the world's second largest economy, the performance of the Chinese economy has a large impact on the broader world economy. China has since the beginning of economic reforms in 1978, not only achieved remarkable economic growth, but also succeeded with the fastest poverty reduction in modern history, by lifting millions of people out of extreme poverty. However, China has in recent years not only experienced some of the world's highest rates of economic growth, but also some of the world's highest rates of income inequality (Yang, 2002). These high levels of inequality reflect on China's Gini[1] coefficient that is estimated by the World Bank to be 0.42 in 2013, but many researchers believe that the level is heavily underestimated and estimations of a Gini as high as 0.61 has been suggested (WB, 2014; Gan, 2013).

The degree of inequality in China might be of central importance to the future success of the country, for more than one reason. Firstly, inequality is often regarded as a risk factor for social instability and political unrest. Social instability can have severe negative impact on China, with its one party political system, and it can result in severe political instability, which may jeopardise the country's continued economic growth. Secondly, increasing levels of inequality have been suggested threatening to the country's chances for continuous high levels of economic growth. As a response to the slowing down of China's GDP growth over the last few years, it has been suggested that China needs to refocus the economy from an export-oriented economy towards an economy driven by domestic consumption. For such a shift to be possible China needs to address its grave inequality problem to be able to create a strong domestic market across the whole country (Gan, 2013).

[1] For further information on the Gini coefficient please refer to section 2.1

Both scenarios are connected to one of the main sources of inequality in China, which this essay will focus on, namely inter-provincial or inter-regional inequality. Regional inequality is linked to the risk of social unrest, though lack of opportunities has been presented as more critical than actual monetary inequality for social stability (Gan, 2013). Provincial inequality is also central to the debate regarding if China needs to refocus its economy towards the domestic market. For this change to be possible a larger part of the society needs to take part than today.

However, this does not tell us anything about why the levels of inter-regional inequality are so high. The root causes and underlying reasons creating inequality are often debated and with the increasing presence of FDI on the world market, FDI has got itself a central place in the debate. FDI has been a main feature of globalization since the 1990s, and its impact on the economic growth and the host country has been debated ever since. The role of FDI in relation to economic growth and income distribution has become an increasingly important subject, as the level of globalization has continued to increase. China has in recent years become the largest recipient of FDI in the world, since they in 2002 overtook the lead from the USA. The inflow of FDI has since then continued to grow. Even so, the inflow of FDI is far from spread evenly across the country, which has created increasing concerns regarding if FDI is linked to continuously growing inequality between provinces within China. In particularly if FDI is further creating a divide between coastal China and the inland provinces (Tang and Saroja, 2005)

1.1 Research question and hypothesises

Following on the introduction to growing inequality and the presence of FDI in China, this essay will with the means of quantitative research, analyse if the presence of FDI has an impact on regional inequality in China. The essay aims at evaluating if the presence of FDI in China is positively related with the country's Gini coefficient and/or variations in the average income level between China's provinces, over a time period from 1992 throughout 2010, in the framework of answering the following hypothesises:

Hypothesis 1:

H_0 = FDI is positively related with the Gini coefficient in China

Hypothesis 2:

H_0 = Higher levels of FDI per capita reflects on a higher average provincial income per capita

This area of research is relevant because trends and underlying reasons for regional inequality have been discussed in the literature for a long time, without scholars coming to an unanimous agreement (Wei, 2002). Furthermore, there is still little consensus when it comes to the question regarding if the presence of FDI benefits the population as a whole, or only a specific segment of the total population (Lin, Kim and Wu, 2013). This essay will relate to that discussion by providing an insight into if FDI enlarges the economic differences between provinces. For a long time, the focus on inequality in China was mainly centralized around the rural-urban divide, but has in recent years moved to focus more and more on the growing inter-regional inequality.

Previous studies of inequality between areas have shown that the level of inequality often is a result of variations in the economic growth rate, but the reasons for variations in the growth rate is more unclear. This is, therefore, an important area of study, though finding the underlying causes for that variation, can help changing policies to turn the trend and reduce the growing level of inequality both in China and internationally (Fleisher, Li and Zhao, 2008). It has been suggested that the level of inter-provincial inequality has been growing more quickly than the level of urban-rural divide in recent years, which makes it an important aspect of inequality to further study, and it will be the main focus of this essay.

1.2 Disposition

This essay will proceed as following, chapter 2 will briefly discusses some of the theoretical background in regards to growth theory, inequality, the impact FDI has on the host economy, followed by an outline of China's path though economic reforms, focusing on changes to patterns and trends of inequality. The chapter will finish of with a discussion regarding the

role of FDI in the Chinese economy. Chapter 3 presents and discusses some of the existent literature on the subject, focusing on the following three areas; literature on inequality in China, literature on FDI and inequality and literature on FDI in China.

In chapter 4 the data and methodology for the empirical analysis is introduced, the models are specified and the variables included in the models are discussed and explained thoroughly.

Chapter 5 presents the empirical analysis and the results from the two fixed effects regressions, starting with discussing the robustness of the models and finishing with outlining some limitations to the models. The chapter finishes with provides some concluding remarks.

2. Theory and Background

This chapter covers the theory and background research. The first part of the chapter focuses on theory, and will discuss some theory in regard to economic growth and inequality such as the Kuznet's curve. Followed by an outline of the Gini coefficient, a common measurement of inequality, and a discussion of a possible link between FDI and income inequality. Followed by a section presenting the background to the topic in a China specific setting. Looking at various kinds of and underlying reasons for inequality in China, and discussing the role of FDI in China, since the start of economic reforms in 1978.

2.1 Theory on Inequality and economic growth

Growing income inequality has often been viewed as a necessary means to an end for transitional economies, to increase productivity during the earlier years of reform (Appleton, Song and Xia, 2013). The idea is consistent with multiple economic growth theories that believe equality will come naturally after a certain degree of economic development has been reached. Two of these ideas are the neo-classical growth theory and the Kuznet's curve that will be described below, and will furthermore be used in the discussion and analysis of China's experience. This section will also introduce the concept of the Lorenz curve and the Gini coefficient, which will be referred to, both in the background section and as a dependent variable in the quantitative analysis.

According to the Neo-classical growth theory, the level of economic inequality will decrease as the process of economic development proceeds. The theory proposes that poorer areas will be able to achieve higher levels of growth than areas with already high levels of GDP. If this theory holds, inequality will with time decrease, when the poorer areas are able to catch up due to their higher growth rate. The theory 'predicts absolute convergence between regions with similar technology and preferences' including factors such as natural resources, government policies, institutional factors and technology (Zhang and Zou, 2012). This condition is at the same time one of the downfalls of the theory, which has been critiques in relation to if regions that are similar enough to hold under these criteria exist at all (Zhang and Zou, 2012).

In the "race to the top" type of economic growth models, increasing income inequality is a natural part of the development process and has been suggested to encourage growth, though it might put pressure on increasing the level of human capital and help creating a competitive labour market (Luo and Zhu, 2008). These types of ideas are consistent with the Kuznets curve that will be discussed next.

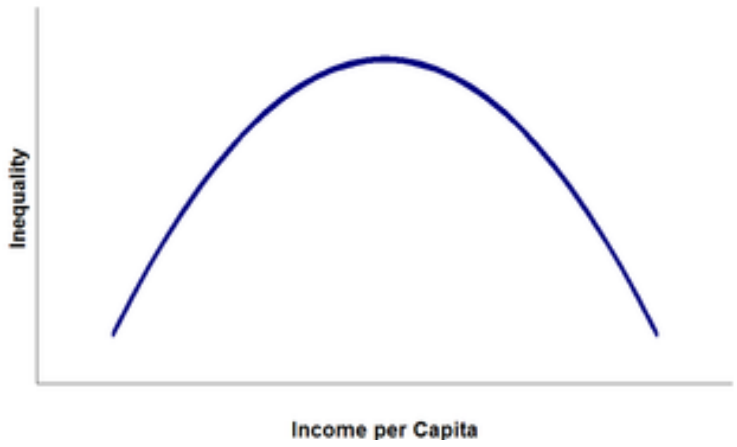
The Kuznets' curve

The Kuznets curve is one of the most famous and commonly referred to theories on economic growth and income inequality in the literature. The Kuznets curve is a theory based on an inverted U-shaped income distribution curve developed by Simon Kuznets in 1955 (Kuznets, 1955). According to Kuznets's theory does inequality increase in the beginning of economic growth, but will then start to decrease once again when the country reaches a certain level of GDP per capita (Kuznets, 1955; Lin, Kim and Wu, 2013; Barrow, 2009). There are multiple explanations to why the level of inequality will increase before it starts to decrease again, and most of them are linked to the 'nature of structural change' (Barrow, 2009, pp. 227). Naugthon (2007) described the thought behind the theory as following:

> "Pockets of modern economic growth would first generate high incomes in a few limited areas while income remained low in most of the traditional economy, but that later growth would ripple out to most of the economy" (Naughton, 2007, pp. 219).

On the graphical illustration of the Kuznets curve does the horizontal axis measure the degree of inequality whereas the vertical axis illustrates the level of per capita income, as shown below:

Figure 1) Kuznets curve – The "Inverted-U"

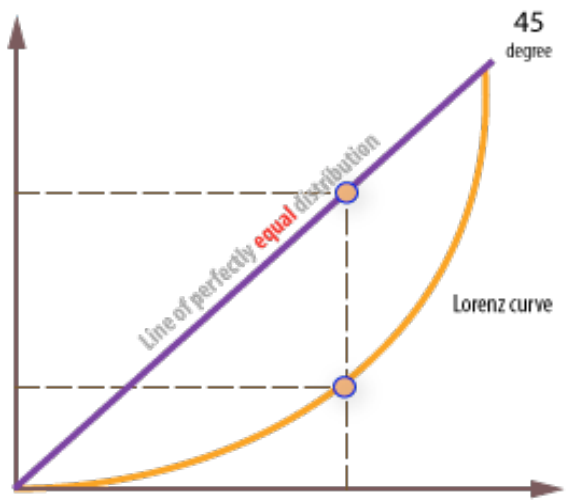


The Kuznets curve theory has been critiqued for not always holding in practice, for example has South Korea and Taiwan achieved high levels of economic growth, without the growth being accompanied by increasing levels of inequality (Barrow, 2009)

The Lorenz curve and the Gini coefficient

A common tool in analyses and comparisons of inequality is the Lorenz curve and the Gini coefficient. The Lorenz curve graphically illustrates the income distribution in an area of interest. The Lorenz curve demonstrates the percentage of the population that receives a certain percentage of the total income. With the horizontal axis illustrating the cumulative percentage of the population and the vertical axis illustrates the cumulative percentage of the total income. The curve must be allocated below the 45° line that illustrates perfect income equality, this implies that the closer the curve is to the lime the more equal is the income distribution. The Lorenz curve is a helpful tool to graphically illustrate the level of inequality within one or between areas of interest, and it is used to derive the Gini coefficient from as described below (Barrow, 2009).

Figure 2) The Lorenz curve



Source: www.economicsonline.co.uk

The Gini coefficient was invented by Carrado Gini in 1912, and is still one of the most used measurements of inequality in the literature. The Gini coefficient can be used both to measure changes in inequality over time and/or the level of inequality between various groups of a

population and geographical areas, such as regions and provinces, as in the case of this essay. The Gini coefficient is measured on a scale from 0 to 1, where 0 is absolute equality and 1 is absolute inequality. The Gini coefficient is derived from the Lorenz curve (Barrow, 2009). The main limitation with using the Gini coefficient as a measure for inequality is the interpretation of the results. This problem is based in the fact that a set value of the Gini coefficient does reflect on multiple various distribution curves.

The Gini coefficient can be calculated both from income and GDP per capita, and for the purpose of this essay the Gini coefficient will be calculated based on GDP per capita. Some of the advantages by using GDP per capita includes that it is a relatively consistent measure over time and space, and that the data are readily available. Furthermore, the method of how to calculate income is more defuse, and what to include and not include can vary, whereas the GDP per capita measure includes all sectors of the economy. Finally, due to the commonality of using GDP per capita as a measurement, the result will be easy to compare and contract with the result of other studies. On the other hand, there are some disadvantages, which includes that the GDP per capita does not take into consideration the various 'price points' across areas.

There Gini coefficient can be calculated in multiple different ways, for the purpose of this essay will be following method be used. If the Gini coefficient is given the notation, G the formula for the Gini coefficient represented by:

$$G = \frac{1}{2} n^2 \mu \left(\sum_{j=1}^{m} \sum_{k=1}^{m} n_j \, n_k \left| y_j - y_k \right| \right) \qquad \textbf{(1)}$$

This formula is drawing on the x and y co-ordinates given from the Lorenz curve to calculate the Gini coefficient. In formula **(1),** m stands for distinct income groups, and each income groups is denoted j, and the total number of 'people'[2] is denoted by n. ($y_j - y_k$) is the income difference between all 'individuals', which are denoted by 'j' and 'k', finally is the average income denoted by μ. Finally, the formula is divided by two, because all the income differences (j's and k's) are counted twice (Barrow, 2009).

[2] It does not have to be people but can be any other entity such as countries or provinces, the same counts for 'individuals'.

2.2 Theory on FDI and income inequality

The main focus for this essay is not the relationship between economic growth and inequality, but rather to analyse if there is a link between the presence of foreign direct investment and inequality.

For the purpose of this essay the following definition of foreign direct investment (FDI) will be used:

> "An investment made by a company or entity based in one country into a company or entity based in another country" (Investopedia, 2014)

The presence of FDI, and a country's level of economic growth are often suggested to be closely related. FDI is in most cases closely linked to export, which has been a main driver for rapid economic growth in many Asian countries, including China (Zhang and Zou, 2012). However, various kinds of FDI might influence the recipient country in different ways. It is both dependent on the type of FDI as well as the current situation in and as well as the conditions posed by the host country. Some of the advantages of FDI, commonly raised in the literature, are that they can act as a compliment to the domestic market and fill gaps in certain areas, such as in accumulating foreign exchange, domestic savings and management. FDI might be able to assist the recipient country to improve its achievements in economics-, as well as with broader development, by filling these gaps (Todaro and Smith, 2009).

Inflows of FDI into the economy are also commonly regarded as a way to gain new knowledge and skills and to access new technology, through transfers and/or spill-over effects (Todaro and Smith, 2009). However, it has been suggested that this transfer of skills and new technology is far from guaranteed. Instead, the presence of FDI, rather than improving the domestic skill and technology level can be crowding out local firms. Even so, the presence of FDI has in some instances been linked to an increase in the degree of human capital. For example by the companies offering further training and education to its employees, as well as investing in- or establishing new local educational institutions. The willingness of foreign firms to invest in training and education is both dependent on the initial level of education in the country as well as the cost of education and further training in the recipient country. Both factors are further more important when foreign firms chose which country to invest in.

Countries with an initial high level of education and low costs for further education are often preferred (Alfaro and Rodrigues-Clare, 2004; Te Velde and Xenongian, 2007; Dutta and Osei-Yebola, 2013).

FDI has been suggested to impact negatively on the country's level of inequality by widening the wage gap and creating a dualistic economy. However, this is far for certain and the question regarding if FDI is increasing the wages at all, across the economy or only for some, is still highly debated. Previous international studies conducted in various countries around the world, have suggested that foreign firms have a tendency to pay higher wages than domestic companies. If it is the case, that the presence of FDI increases the average wage, this can have a positive impact on the whole economy. Higher wages could help lift the average income of the country, and assist the economy to transit from a low-technological labour intensive economy towards a high-technological capital intensive economy. A change which often is proposed to be crucial for sustainable long-term growth. One reason for foreign firms to pay a higher wage compared to domestic firms, might be to reduce the risk of technology spill over, by creating a beneficial advantage for the employees to stay longer with the firm (Heyman, Sjöholm and Gustavsson Tingvall, 2007).

However, research has shown that foreign firms do not pay higher wages for the identical worker, which means that their presence can instead lead to increasing income inequalities. In this scenario wage variations are rather explained by underlying reasons such as education, gender, ethnicity, migration status and location of the firm within the country (Heyman, Sjöholm and Tingvall, 2007). This being said, FDI are in many cases willing to pay higher wages for highly educated employees, and the presence of FDI has therefore shown to have a larger negative impact on the income distribution in country's experiencing an average higher level of education (Lin, Kim and Wu, 2013). The presence of FDI might not only widen the wage gap between various groups of workers, but also between different regions of the country. Inflows of FDI are often heavily concentrated in a limited area of a country, which might result in an increased wage level in particular areas, but not in the country as a whole. If this is the case, the presence of FDI might enhance the level of regional inequality (Todaro and Smith, 2009).

2.3 China's path of economic reforms and inequality

China's increasing levels of inequality has often been regarded as one of the outcomes of the country's transition from a planned economy towards a 'socialist style market economy'[3]. A transition away from a planned system to a more market-based system have created 'winners and losers', and increased the general level of inequality between various groups of society. Despite the fact that economic reforms often are blamed for China's high levels of income inequality, the presence of inequality is not a new phenomenon (King, 2012). Two historical time periods when inequality became particularly apparent in China, was during the Cultural Revolution and under the Great famine (Kanbur and Zhang, 2005). However, generally low levels of income across industries and regions in the pre-reform area and the segregation or the urban and the rural sphere, made inequality less apparent before the start of economic reforms in 1978. Inequality was often a result of strategically political decisions such as the division of the urban and rural labour force, as well as the choices of where to allocate heavy industry (Luo and Zhu, 2008). Nevertheless, despite long-term presence of inequality, it was kept at a low level, and China was up until a few areas into reforms one of the world's most egalitarian societies, (Zhang and Zou, 2012).

However, economic reforms have not always been bad for inequality, and China was probably as equal as it has ever been in the first half of the 1980s. Reforms started in the rural areas with changes to the agricultural system such as the introduction of the 'household responsibility system'[4], which resulted in a drastic increased agricultural productivity level. Followed by a rapid increase of township village enterprises (TVEs) that helped diversify the employment opportunities and reduce underemployment and by doing so increase the rural income (Knight, 2013). The outcome was a remarkable poverty reduction, where millions of rural residents were lifted out of absolute poverty (Naughton, 2007). Furthermore, did these

[3] Definition socialist market economy: "The most essential difference between a socialist market economy and a capitalist market economy is that the former is linked to the basic socialist system and is part of socialist economic mechanism" (www.china.org.cn, 2004)

[4] Definition household responsibility system: "the household responsibility system was an agriculture production system, which allowed households to contract land, machinery and other facilities from collective organizations. Households could make operating decisions independently within the limits set by the contract agreement, and could freely dispose of surplus production over and above national and collective quotas" (www.china.org.cn, 2009)

reforms in the rural sector lead a decrease in the inequality levels, and there were strong signs of both inter-provincial and rural-urban income convergence (Zhang and Zou, 2012).

Unfortunately did the income convergence trend not last long, and a few years into the transition period, when reforms reached the urban sector, inequality levels once again started to steadily increase. From 1985 onwards China's Gini coefficient increased and China was moving from being one of the worlds most equal towards one of the world's most unequal society. With growing inequality between multiple layers of the society, such as rural-urban inequality, gender inequality, coastal-inland inequality, and inequality based on household registration as well as 'within group' inequality (Knight, 2014; World Bank, 2000). The inequality gap grew even deeper after 1992 when Deng Xiaoping said "let some people get rich first", in a speech on the famous 'Southern tour'. The 'Southern tour' was the start of a period of more rapid changes and reforms. It was a strong push for further economic reforms with an emphasis on increasing the inflow of FDI, and policies and regulations were introduced to improve the business climate (Naughton, 2007). The changes paid off and in 1993 did China become the largest recipient of FDI among developing countries. The increase in FDI was massive, and inflow of FDI almost tripled from 1991 to 1992, and it has since then continued to grow rapidly (China statistical yearbook, 1993).

Economic reforms and the opening up to new company ownership forms, required changes to the labour market. However, the transition away from an egalitarian style labour allocation system to a more market-based system, created 'winners and losers'. Two of the new 'losers' on the new labour market are people with low levels of education and women. During the pre-reform area there were non or very low financial returns to higher education in China, implying that the income difference between skilled and unskilled labourer was very low if even existing. However, with a more market-base labour system the level of education has become an increasingly important factor determining the wage, in particularly for urban workers. With an estimated 40% of the total wage increase between 1988 and 1995 being linked to education, education is regarded as one of the largest contributors to China's growing wage differences (Appleton, Song and Xia, 2005; Gan, 2013).

Despite introducing free primary education across the country, the quality of education varies significantly within China, and there are still major differences in the access to higher education. As a result, there are large differences in the percentage of the population with

higher education, and it is suggested to be closely linked to China's broader rural-urban and inter-provincial inequality levels (Ash, 2006; Franco and Gerussi, 2012). At the same time as education can be regarded as a source of inequality it can also be seen as a means to reduce inequality. The government has in the last decade introduced multiple policies to improve the access to education in rural areas and for ethnical minorities. In 2009 did the government increase its spending on education with a staggering 45%, which continued to increase further the following year (KPMG, 2005).

Another group that was hit hard by the changes to the labour market was the women. Wage inequality between the genders was on very low levels before reforms. Since then the gender wage gap has been on a constant up rise, and in 2011 women were estimated to earn almost 20% less than their male counterpart. One factor behind this trend, is the competition many women in the urban sector now faces from migrant workers. The 'Hukou' system facilitate a situation where migrant workers, often men, are willing to take up urban low skilled jobs, that traditionally would be hold by women, on a lower wage than an urban woman would do (Su and Heshmati, 2011; Mukhopadhaya, 2013).

2.4 Rural-urban and inter-provincial inequality in China

In this section two of the main contributors to China's overall levels of income inequality will be addressed. Firstly, China's rural-urban inequality followed by a discussion on China's inter-regional income inequality.

Rural-urban inequality

The level of rural-urban income inequality has continued to increase since the 1980's and is today one of the main contributors to China's overall high levels of income inequality (Zhang and Zou, 2012). The gap between the urban and the rural population in China is now so deep that it is classified as one of the worst in the world, in the same category as countries such as South Africa and Zimbabwe (King, 2012). The rural-urban divide trances back to the pre-reform area, and a household registration system, referred to as 'Hukou'. The 'Hukou' system is a central feature of the Chinese society that enables rural-urban inequality to persist and continue to rise. Under the 'Hukou' system do everyone receive an urban or rural household registration at birth, which is very hard to change later on in life. The 'Hukou' system is

thereby dividing the country's labour market into two separate entities. As a result, workers registered with a rural 'Hukou' do not obtain the same rights while working in urban areas, which enables employers to pay them a lower wage and provide them with generally lower working conditions. (Su and Heshmati, 2011; Luo, 2008).

Inequality between rural and urban citizens, extend beyond income, and their household status impacts on which services and subsidies they receive from the state. This divide becomes even more apparent when millions of migrant workers come into the picture. Migrant workers are people living and working in the city, but they are not entitled to the same level of education and healthcare as residents with an urban 'Hukou'. The 'hukou' registration system do also make it harder to estimate how severe the level of rural-urban income inequality actually is, due to the unclear status of up to hundreds of millions of migrant workers. Most of them are still registered as rural citizens, despite living and working in cities, and the income for many rural households are increased by remittance send back from migrant workers in the cities (Kanbur and Zhang, 1999).

The level of rural-urban inequality varies heavily between provinces both in terms of magnitude and in terms how much it has increased over the years. The magnitude of the rural-urban divide is often related to both the provincial level of urbanization and to the proportion of the rural population still being engaged in agricultural activities (Zhang and Zou, 2012). Rural-urban inequality is therefore often less of a problem in the coastal provinces, due to the fact that these provinces were able to diversify the rural economy away from agriculture both faster and on a broader scale than most inland provinces (Ash, 2006). The relatively low earnings from agriculture are also suggested to be the main reason for the increasing income gap within rural areas. Where the level of income between people still engaged in agriculture activities compare to others are increasing. As an outcome, has it been suggested that, the level of within rural inequality now is larger than the level of rural-urban inequality (Fang and Rizzo, 2011).

Inter-regional inequality

Inter-regional inequality, such as a coastal-inland divide or an east-west divide is another form of inequality that is far from a new concept in China. In the literature, the coastal or eastern region do in most cases refer to the same area consistent of the three metro cities,

Beijing, Shanghai and Tianjin and the nine the coastal provinces; Shangdong, Guangxi, Guangdong, Fuijan, Zhejing, Jiamgsu, Liaoning, Hainan and Hebei. The western region refers to the western provinces of Shaanxi, Sichuan, Yunnan, Guizhou, Gansu, Qinghai, Tibet, Xinjinag, Chingqing, and Ningxia. The inland region do commonly refer to the western region combined with the central and northern provinces of Inner Mongolia, Shanxi, Anhui, Jiangxi, Henan, Hubei, Hunan, Jilin and Heilongjiang. However, when talking about west China, authors often refer to a broader area of inland China than what would strictly speaking be included geographically (Ma and Summers, 2009).

Despite 'Western' China or inland China often being discussed as one area, it is important to mention the large variations between the provinces in the region as well as the large differences within the provinces themselves. These provinces have large variations in terms of geography, climate, resource base and culture. The inland region is resource abundant, and has approximately 80% of the country's total water resources and 60% of its coal reserve. Both water and coal are scarce resources in China and crucial elements to the country's economic success during the last decades. This highlight two things, firstly that geography cannot alone explain why the region is lacking behind coastal China, and secondly, the importance of western China for the country to continue having high levels of economic growth (Ma and Summers, 2009).

The various development paths for different regions across China are not only the result of various policies introduced after the start of reforms, but also the outcome of China's pre-reform planning strategies. Most of the country's heavy industry was allocated in the inland provinces and lighter industries were situated in the coastal areas, which was the result based on both political and geographical reasons, such as a larger concentration of natural resources in the inland provinces. However, this industrial divide has continued to influence the economic development of the regions for decades. Heavy industry such as mining and other natural resource related industries have to a larger extent remained in the government ownership, when other industries have been sold out. This difference has further increased the presence of private and foreign firms in the coastal region compared to the inland region (Ouyang, 2009).

Another factor impacting on maintaining high levels of inequality between regions are inter-regional trade barriers. Various forms of trade barriers implemented by the local governments

are preventing fare competition and trade between regions (Zhang and Zou, 2012). These types of trade barriers between regions result in fragmentation of the Chinese market, which prevents poorer regions to develop and compete in their sectors of comparative advantage. This has been suggested as one reason limiting provinces ability to build up a profitable industrial base. Fragmentation of the market can furthermore, negatively impact on spill over effects from the richer and more advanced provinces as well as from FDI, which limits the inland provinces ability to adopt new skills and technology (Young, 2000; Qiu, Li and Sun, 2003).

It is not only the level of wage and general income that varies between provinces but there are also large differences when it comes to other broader developmental measurements, as a result of large variations in the access to and quality of healthcare and education. For example did China in 2003 have an average human development index[5] (HDI) score of 0.75[6], but Shanghai had as high as 0.91, closely followed by Beijing and Tianjin with scores of 0.88 and 0.86 respectively. On the other end of the spectrum were provinces such as Yunnan with 0.66, Guizhou with 0.64 and Tibet with the lowest score of 0.59. Whereas China as a whole have developed rapidly and achieve remarkable improvements both in its economic growth and broader development these western provinces are still stuck on levels corresponding to China in 1990 and 1980, when the country score was 0.63 and 0.56 (Naughton, 2007).

Going west strategy

As a response to the high levels of regional inequality the country was facing, a developmental plan to open up and improve the economic and broader developmental conditions of the western parts of China was introduced. The so-called 'Developing the West' or 'Opening up the West' initiative were introduced by the government in 1999, and implemented in 2000. The strategy included China's western provinces, as well as Inner Mongolia, despite the province technically not being a western province (Ma and Summers, 2009). (Ash, 2006; Ma and Summers, 2009). The strategy was focusing on five key areas in

[5] Definition Human development index; "The Human Development Index (HDI) is a statistical tool used to measure a country's overall achievement in its social and economic dimensions. The social and economic dimensions of a country are based on the health of people, their level of education attainment and their standard of living" (The Economic Times, 2014).

[6] HDI is measured on a scale from 0 to 1, with 0 being the lowest score indicating the lowest level of human development and 1 being the highest score (The Economic Times, 2014).

an attempt to generally make the area more friendly and attractive to foreign direct investment (Ma and Summers, 2009). The five areas of focus were: "infrastructural construction, human capital formation, environmental protection, improvements in regional investment conditions and the development and restructuring of local industries" (Ash, 2006, pp. 182). To achieve these goals large amounts of government investment and loans were assigned in the 10th Chinese 5-year plan. However, in order for the strategy to work and have a long-term impact on the growth and development of the region it is crucial to attract private capital from both domestic as well as international firms (Ash, 2006; Ma and Summers, 2009).

The success of the initiative has been debated, though regional inequality has continued to grow rapidly, and was estimated to accountable for a third of China's total inequality in 2006 (Wei, Yao and Liu, 2007). However, despite that the success of the initiative has been questioned, the Western provinces did experience increased growth, and the GDP of the western region increased with approximately 10% between 2000 and 2004 (Ash, 2006). In recent years the importance of the western and inner region of China have once again climed up on the agenda. During the last financial crisis, the export sector in the coastal region, which has been one of the main drivers of China's economic success story, was suddenly struggling and it became apparent that change was needed to guarantee the country's continuous economic growth. As a result policies and targets to rebalancing development within the country where introduced aiming to reduce the level of inequality, and to make the whole of China more engaged in the country's future economic growth (Ma and Summers, 2009).

2.5 FDI and regional inequality in China

Transitioning from being a relatively closed economy, did China in 2002 take over from the USA as the world's largest recipient of FDI (Tang and Saroja, 2005). FDI has during the last decades played an important and significant role in shaping and influencing China's economic growth and transition path. It has been suggested that FDI helped China undertake the rather smooth and rapid path towards what the communist party would refer to as a 'socialist market economy', and that FDI never has before played such a profound role for the development of an economy as it has done in China (Chen, Chang and Zhang, 1995). No matter if that is the case or not, it is clear that the increasing presence of FDI has played a significant part during the Chinese transition and in shaping the economy and society.

Allowing foreign investment, although only in restricted areas and under certain conditions, was one of the earliest policies introduced after the start of reforms. The foreign direct investment policy was introduced already in 1979, and enabled an increase in trade and foreign exchange, which further enabled an increase in the country's GNP. During the first years of reforms, the inflow of foreign capital was limited and mainly in the form of foreign loans and aid. For example, in 1979 over 90% of the inflow of foreign capital was in the form of loans. The inflow of foreign capital in the form of FDI started to take off when China established its first four special economic zones (SEZ)[7]. In the special economic zones, foreign investment were not only allowed, but foreign companies were also granted special beneficial conditions, including but not limited to tax benefits, import duty exceptions, and special allowance for foreign exchange. All four of these first special economic zones were allocated in the coastal provinces of Fujian and Guangdong. Fujian and Guangdong were thereby privileged, both with these special conditions, their coastal location and their close ties to Hong Kong and Taiwan, the two main regions of origin for the early inflows of foreign investment. The success of the first four special economic zones resulted in the opening of further SEZ along the coast as well as the opening of 14 coastal cities in 1984 to foreign investment (Zhang and Zou, 2012; CSIS, 2014).

When the rest of China opened up to foreign investment the inflow of FDI continued to be heavily concentrated in the costal region. The coastal provinces were naturally a favourable choice for FDI due to geographical reasons, such as easy access to global trade routes (Branstetter and Feensta, 2002). Both Guangdong and Fujian continued to be the destination of choice for FDI and in 1990 did Guangdong receive a staggering 41.9% of all foreign direct investment and Fujian the second largest recipient received 8.3% of the total inflow (Chen, Chang and Zhang, 1995). However, the inflow of FDI started to spread out more over time, but was still focused within the coastal provinces and the three metro cities[8], and in 1999 coastal China was the recipient of almost 84% of the country's total amount of FDI (China Statistical Yearbook, 1991; Fu, 2004). The high concentration of FDI in the coastal region, in

[7] Definition special economic zone: "Designated areas in countries that possess special economic regulations that are different from other areas in the same country. Moreover, these regulations tend to contain measures that are conducive to foreign direct investment. Conducting business in a SEZ usually means that a company will receive tax incentives and the opportunity to pay lower tariffs" (Investopedia, 2014)

[8] The three metro cities are Beijing, Shanghai and Tianjin

combination with the strong link between FDI and export resulted in a high rate of economic growth in the region (Fu, 2004). The high rate of economic growth and increasing incomes made the coastal provinces attractive to FDI for yet another reason, the domestic market. With the GDP per capita rapidly increasing foreign firms became in a larger extent attracted by the enormous size and possibilities of China's domestic market (Ouyang, 2009).

Introducing foreign investment to the market was also both a way to introduce competition and new skills and technology to the Chinese economy. Firstly, many of China's state owned enterprises (SOE) had suffered from losses, low productivity and overemployment for a long time. When faced with global competition both the productivity level as well as the product quality had to improve, if they were to be competitive and survive in the long run. Despite efforts to improve, many state owned enterprises continued to have low productivity, over employment and go on losses. When reforms moved into a more rapid phase and the focus shifted towards urban areas, the Chinese government introduced changes to state owned enterprise. Millions of people were laid off from poor preforming SOE's around the country, and the presence of firms under other ownership structures became increasingly important, to absorb the increasing abundance of unemployed workers. One again the coastal area was in a privileged situation with its large presence of private firms and inflow of FDI (King, 2012). Secondly, increasing the product quality, especially in terms of technology links to another reason for the government to allow FDI, which was high-technological technology transfer or spill over effects into the broader Chinese economy (Chen, Chang and Zhang, 1995).

Once again the coastal provinces were the winners, as they were most likely to benefit from spill over effects in terms of skills and technology. FDI and export are concentrated in low technological manufacturing, with week backward linkages and thereby are the broader spill over effect to inland China limited. The spill-over effects into inland China might be enhanced through labour movement, when workers from inland China move towards coastal China for employment and will when they return home be able to bring with them new skills and technology (Ouyang, 2009). However, the 'Hukou' system might limit this rout for transfer and spill-over of skills and technology, by limiting movement of people and by making it harder for migrant workers to access more advanced employments (Zhang and Zou, 2012)

3. Literature review

This essay does to a large extent build upon three broad areas of literature. Firstly, literature analysing the presence, trends in-, development and underlying reasons for the presence of inequality in China. Secondly, literature discussing a possible association between presence of FDI and inequality, and in what way this possible relationship takes form, and finally, literature covering the topic of FDI in China. The following section will briefly introduce some on the core literature on these tree areas of research, in the order presented above.

3.1 Literature on inequality in China

During the last decades, issues of economic inequality and income inequality in particularly has been of increasing focus for scholars, and a hot topic for research, with China being a country that has receiving a lot of attention. As the level of inequality has continued to increase in China, so has the amount of research going into the subject. This essay focuses on inter-provincial inequality, which is considered one of the main sources of inequality in China today, which previous research have suggested to be founded in the governments favourable policies towards the coastal region (Fu, 2004; Kennedy, 2014).

However, there is neither one explanation nor one cause of inequality. Therefore, a vast amount of literature has covered various angels of the topic, Such as the presence of inequality within and between various groups of population or geographical areas, analyses of possible underlying reasons for inequality, patterns of changes in inequality and much more. Multiple studies suggest that, there is a close link between human capital, often defined as the level of education, and economic growth. Cai, Wang and Du found a positive relationship between the number of years of education and the GDP growth per capita in China (Cai, Wang and Du, 2002). Other underlying reasons for inequality commonly found in the literature is gender, ethnicity, experience and membership of the Chinese communist political party (Wei, Yao and Liu, 2007; Gan, 2013).

For decades, a lot of focus has been on the growing rural-urban income gap in China. However, in the last years the debate has been moving more and more towards the issue of inter-provincial inequality. Multiple researches have focused on trends in regional inequality, and studied if the level of regional inequality in China is converging or diverging over time.

This research is often conducted in relation to the Kuznets curve, a theory suggesting that the level of inequality will increase before it once again decreases (Kuznets, 1955; Lee, 2010; Barrow, 2009; Wei, Yao and Liu, 2007)

3.2 Literature on FDI and inequality

One of the earlier pieces of study conducted on the role of FDI on income inequality, is the research by Mundell in 1957. He found that, the presence of FDI would generally not have a significant impact on the recipient country's income distribution, and if an impact were to be found, it would then rather be reducing than increasing the level of inequality (Mundell, 1957). These results have been much debated ever since, and the role of FDI in relation to economic growth and income distribution has become an increasingly important subject, as the degree of globalization has continued to increase. The results of the study by Hemmer, Kruger and Seith in 2005 are to a large extent in line with the findings by Mundell, almost fifty years earlier. In their study on the relationship between FDI and income inequality, they did not find any evidence suggesting that FDI neither would influence inequality on a general level, nor would it have a significant impact on income distribution.

Research have suggested that, the influence FDI has on income distribution, depends on a combination of the presence of FDI and other underlying factors, such as high regional concentration of FDI, the type of FDI, and the recipient country's general level of education. Despite that, a lot of studies have reached a consensus that FDI is beneficial for economic growth under certain conditions. The same studies do also find that strong regional concentration of FDI can have server negative effect. Heavy regional concentration of the inflow of FDI in a country, can lead to uneven development and increasing inequality, according to multiple studies from around the world including, but not limited to; Nunnenkamp and Stracke, 2007; Zhang and Zhang, 2003; Fujita and Hu, 2001; and Lin and Liu, 2000.

Franco and Gerussi (2013) conducted an international study, covering 17 transition countries, to analyse the effect FDI have on income inequality. China is not included in the study, but the study is still of high interest, though China had a lot in common with other transitional economies before the start of reforms. They do not find a direct link between presence of FDI

and income inequality, but highlights that the type of FDI might be crucial in determining if FDI have a negative impact on income inequality or not (Franco and Gerussi, 2013).

Education is another underlying factor that has been suggested influencing on if the presence of FDI impacts the level of income inequality or not. There are multiple studies addressing this topic from various angles, covering areas from the country's initial level of human capital, to costs and possibilities for further education, such as the studies conducted by; Te Velde and Zenogiani, (2007), Alfaro and Rodriguez-Clare, (2004), and Dutta and Osei-Yeboah, (2013). They concluded that, the initial skill level in the host country impacts the influence FDI has on income inequality. They did also find that, the presence of FDI, in multiple cases have been suggested increasing the general skill level, in particular in relation to higher education.

Another area of research is the relationship between FDI and wages. There are multiple previous studies looking at the link between FDI and wage inequality for various countries, as well as international comparisons studies. There are various international studies focusing on if there exist a so-called 'foreign ownership wage premium' or not. Lipsey and Sjoholm's study on wage differences between white and blue-collar workers in Indonesia found that when foreign ownership overtook domestic firms it commonly increased the wages (Lipsey and Sjoholm, 2002). Heyman, Sjöholm and Tingvall conducts a study on Sweden in 2007 that, found that foreign firms do pay higher average wagers, but there is, however, no evidence saying that they pay higher wages for identical workers. The results implies that the higher wages can be related to the type of industry or the human capital of the workers employed by international companies, rather than being a result of its foreign ownership (Heyman, Sjöholm and Tingvall, 2007). A study by Girma and Görg reached a similar conclusion to the study by Heyman, Sjöholm and Tingvall. They found that MNEs indeed do pay a higher average wage than domestic firms, but the higher wage are rather a result of the sector MNEs worked in than of the actual company ownership form (Girma and Görg, 2007). Furthermore, did Jensen and Roasa (2007) conduct a study on the existence of a wage premium for employees of MNEs in Mexico. Contrary to many other studies did they find that, when the inflow of FDI increased the level of inequality decreased (Jensen and Rosas, 2007). This section can therefore conclude that, how, if, and under which conditions the presence of FDI, do impact on income inequality, still is highly debated. However, does a

general understanding seem to be that, it is not the presence of FDI alone that increases the level of inequality, but the presence of FDI in combination with other factors.

*3.3 Literature on FDI in Chin*a

One of the main features of FDI in China, is its heavy concentration in certain provinces or regions. Due to this regional centralization of FDI in China, have multiple authors suggested that FDI has played a crucial role in increasing inequality between regions within the country, such as Zhang and Zou, 2012; Brun and Renard, 2002; Demurger, 2001 and Fujita and Hu, 2001. Wei, Yao and Liu (2007) found that it is the uneven distribution of FDI between regions rather than the presence of FDI itself that are creating growing inequality between provinces and regions (Wei, Yao and Liu 2007).

The impact FDI has on regional economic growth in China was researched by Sun and Cai already in 1998, they found that FDI has had a larger effect on economic growth in the eastern provinces than on the rest of the country, these results imply that FDI has impacted on increasing regional inequality (Sun and Cai, 1998). Contrary to many other studies did Ouyang (2009) find that FDI has had a significant positive spill over effect from the coastal to the inland provinces, and have thereby had a positive impact on growth even in China's inland provinces (Ouyang, 2009). In line with the study by Ouyang (2009), Dollar and Kraay (2002) did also suggest that the inflow of FDI to China was having a positive impact on decreasing inequality, and that it was an important player in China achieving its remarkable poverty reduction (Dollar and Kraay, 2002).

It has furthermore been suggested that, the presence FDI might have a negative impact on certain kinds of inequality and at the same time have a positive impact on other types of inequality. Lee (2010) found in her research that the presence of FDI in China reduces wage inequality. At the same time, does she believe that the reforms introduced in 1992, with a strong emphasis on increasing the inflow of FDI have played a crucial part in increasing the level of regional inequality, as well as increasing wage inequality between sectors (Lee, 2010).

4.Data and Methodology

This chapter will first present and discuss the data source and reliability. Thereafter, the methodology chosen for the empirical analysis will be described, and each variable will be discussed in terms of its importance to the mode, how the variable is derived and the expected outcome of the variable in the model. Finally, the two models used for the empirical analysis will be introduced.

4.1 Data

All the data for this essay are collected from the China Statistical year books from various years, as well as from 'China Yearly Provincial Macro-Economics Statistics', which all is provided by China's National Bureau of statistics (NBS). NBS provides a broad rage of data, ranging from statistics related to the economy and the population, to broader social and developmental topics such as education and culture. They provide data from all levels of society, from national statistics down to city level statistics, on various time frames. For the purpose of this essay yearly provincial data will be used, which will be further discussed below for each variable.

The reliability and consistency of the statistical data provided by China's National Bureau of statistics has been discussed and evaluated for decades, and relates back to the extreme faults in the data during the Great Leap Forward. During the great Leap Forward the agricultural production was heavily overestimated which resulted in the worst famine in modern history. More recently the National Bureau of Statistics has been accused for publishing data that are overestimating the Chinese economy's growth and underestimating its level of inflation (Koch-Weser, 2013). Another area of data that has been criticized is statistics on consumption rates, which has been suggested being over relying on retail sales in its estimation and ignoring other sorts of consumptions (Koch-Weser, 2013). However, as a response to the critique a lot of effort has gone into improving the quality of the data. As a result of the improvements that have taken place during the last decades, and less reliance on information from the local governments, the data are constantly becoming more reliable and consistent. Instead of relying on information from local authorities, data are now often collected direct from sales rates, investment into fixed assets rates and reports from the major enterprise, which is supposed to create more consistent and reliable data. Statistics from the China

national bureau of statistics is the most used and referred to data source on China and, despite it having its faults it is often considered the best data accessible on China (Orlik, 2011).

4.2 Methodology

In order to develop an understanding regarding if FDI do, or do not, influence the level of provincial inequality in China, and to be able to reject or accept the two null hypothesises expressed in section 1.1, two models based on the panel dataset are created to conduct the empirical analysis. Panel data is also commonly referred to as cross sectional time series data, and is a form of longitudinal data. It refers to a dataset that contains time series observation over a number of cases, which implies that the dataset always includes at least two dimensions. One cross sectional dimension, with the subscript i, and one time series dimension, with the subscript t. As it observes both changes over time and space, panel data is popular in social science.

The panel-data set used for this analysis covers 29 Chinese provinces, spanning over the period 1992 through 2010. The provinces included in the panel dataset, as well as, the time period chosen will be further discussed below. The panel dataset used in this essay is, furthermore, a balanced dataset, which means that all variables included in the models contain the same number of observations.

Some of the advantages of using panel data for the empirical analysis are that, panel data as a result of its multiple dimensions can capture more complex relations in comparison to a single cross-sectional data set. The multi dimensional aspect of panel data is also supposed to make the model better in terms of controlling for omitted variables. One disadvantage with the panel data is that, the data collection is more complicated and it is in many cases difficult to obtain information form the same 'individual' over multiple time periods. (Barrow, 2009; Asterious and Hall, 2011)

Time frame

The quantitative analysis in this essay will cover the time period of 1992 to 2010. The reason for the 2010 cut-of point is simply a result of, lack of data or inconsistent access to data for the following years. Statistical data is commonly, lacking behind one to a few years to current

time, due to the time required for collection and publishing of new data. The starting point of 1992 is chosen due to data inconsistency in previous years, but 1992 is also an interesting year in China's transitional path, and a particularly important year in regards of FDI into China. The year 1992 marks the beginning of more progressive reforms and an increasing inflow of FDI, and is often regarded as the start of rapidly increasing levels of inequality and thereby an increasing Gini coefficient in China. On the other hand, the new policies in 1992 did also try to promote the inner provinces, and the first special economic zone allocated in a non-coastal province was opened that year. For these reasons should the period covering 1992 to 2010 provide a good picture of the impact FDI has on regional inequality in China.

Provinces

All data used in this essay are collected and calculated on a provincial basis. Out of China's 31 provinces, 29 are included in the analysis, excluding the provinces of Hainan and Chongqing. Hainan and Chongqing are excluded from the analysis due to data limitations, originating in that fact that both areas used to be part of other provinces. Hainan was a part of Guangdong until 1988 when it became an independent province, and Chongqing was a part of Sichuan until 1997 when it became the fourth municipality[9] of China. Despite the fact that Hainan became an independent province four years before the time period used for the empirical analysis in this essay, the data for the province still proved to be inconsistent and the province is hence excluded. This is not an uncommon practise, and these provinces are often excluded in empirical analyses of China (Ma and Summers, 2009).

4.3 Variables

Dependent variable model – the Gini coefficient

In the first model, the Gini coefficient is used as the dependent variable. The Gini coefficient is, as described in Chapter 2, a common measurement of inequality and is, therefore, chosen to analyse if the presence of FDI has an impact on the level of inequality in China. The Gini coefficient is calculated by the author in accordance to the method specified on page 11.

[9] A municipality difference from the other provinces in the sense that the area is under direct control of the central government, the other three municipalities are Beijing, Shanghai and Tianjin (Ma and Summers, 2009)

For the purpose of this essay, the Gini coefficient is calculated based on provincial GDP per capita data, and the variable is in the model referred to as *Gini*.

Dependent variable model 2 - Average income

In the second model, income is used as the dependent variable. The average income is calculated for each province, based on the average yearly disposable income for urban residents and the average yearly net income of rural residents. For the purpose of the empirical analysis the values have been logged. The variable is in the model referred to as *lgincome*. There is a debate regarding if it is preferable to look at income or consumption rates when analysing inequality. In this case, income is used because it includes all sources of income the person or household has, whereas consumption is related to the individual's consumption and saving decisions made by that individual/household (Krueger and Perri, 2005). Based on the theory and background sections in Chapter 2, the income variable is expected to be positively related to the amount of FDI per capita in the province.

Independent variable – FDI

The independent variable for both model 1 and model 2 is FDI. The presence of FDI in the provinces has been calculated in two different ways, to be represented by two different variables in the models. This is done to provide a broader understanding on the impact FDI has, or do not have, on inter-provincial inequality in China. For the purpose of this study FDI is always referring to and calculated as the net inflow of FDI.

The independent variable for FDI used in model 1, is referred to as *FDIgdp*. This variable is calculated as the ratio of FDI to the provincial GDP, and is measured in percentages. The variable provides a measurement of FDI that, take into consideration the size of the provincial economy, and the variable is, therefore, good as a comparable measurement to use between provinces. The independent variable for FDI used in model 2, is referred to as *FDIpc*. This variable is calculated as the provincial inflow of FDI per capita, and is measured in Yuan per capita. The variable provides information regarding if FDI has an impact on the average income, without being affected by the provincial population size.

For both variables, the value of the inflow of FDI has been converted by the author from USD into RMB, using the currency conversion table provided in the China statistical yearbook. This measure has been undertaken for the variables to be comparable with the other variables in the models that are measured in RMB. Based on the theory and background analysis presented in chapter two, the variable *FDIgdp* is expected to be positively related to the *Gini* variable, and the variable *FDIpc* is expected to be positively related to the *Income* variable.

Independent control variable - GDP per capita

GDP per capita is a common measure used for estimating inequality between countries, or as in this case between provinces within one country. One of the main advantages from using GDP per capita as a measurement is that, the measurement is commonly used in the literature and in research, the results are, therefore, easy to compare over time and space. Statistics of GDP per capita has furthermore been suggested being the most reliable measurement available over a longer period of time in China, though micro level income surveys often only are conducted periodically and often shift in scope and content over time. On the other hand, a disadvantage with using GDP per capita is that, it does not take into account the variations in the cost level between regions.

For the purpose of this study, the variable for GDP per capita is referred to as *lgGDPpc*. As GDP per capita is a continuous variable, the values have been logged for the purpose of the empirical analysis. The variable is, therefore, measured in logged units. Furthermore, an additional variable based on the provincial GDP per capita is included. According to the Kuznets curve discussed in Chapter 2, the relationship between economic growth and inequality is first positive and then turns negative. For this reason, model 1 will include GDP per capita squared as an additional variable, the variable is in the model referred to as *GDPpercapita2*. The squared GDP per capita variable will be able to confirm or decline the hypothesis suggested by the Kuznets's curve in the case of China. Based on the theory and background provided in Chapter 2, the variable *lgGDPpc* is expected to be positively related to the *Gini coefficient*, whereas the variable *GDPpercapita2* in accordance with the Kuznets curve is expected to be a negative value.

Independent control variable - Trade

Based on the theory highlighting the important role trade has played in China's economic growth and, the large variation in trade across the country, trade is included as an independent control variable in model 1. The variable is referred to as *tradegdp,* this variable is measured in percentage and calculated based on the yearly provincial statistics of total trade, including total export and import, as a ratio of the provincial GDP. For the purpose of this calculation, the data on net trade from the China statistical yearbooks has been converted from USD into RMB, using the currency conversion table provided in the China statistical yearbooks. Due to the large regional variations in trade within China, described in Chapter 2, the variable *tradegdp* is expected to be positively related to the Gini coefficient.

Independent control variable – Government expenditure

The relationship between government expenditure and inequality is complex and can go in two directions. Inequality can either be increasing as an outcome of uneven government expenditures, or the level of inequality can decrease as a result of certain government expenditures, such as transfers (OECD, 2012). For this reason, government expenditure is included as a control variable in both models. The variables for government expenditure used in this study are both based on total local government expenditure. The variables had been more beneficial for the analysis if they could be calculated based on total government expenditure, and not limited to local government expenditure, but unfortunately that is not possible due to data limitations. Local government expenditure is a broad category including areas such as capital construction, innovation funds, support towards agricultural production, culture, education, science and health care, and government administration (China statistical yearbook, 2011).

For the purpose of model 1, the level of government expenditure is calculated as a ratio of government expenditure to the provincial GDP, measured in percentage. This variable is referred to as, *govexpendituregdp*. For the second model, government expenditure is calculated per capita, and measured in Yuan per capita. This variable is referred to as *govexpenditurepc*. Based on previous research indicating that government expenditure often has a large impact on income as well as the Gini coefficient, *govexpendituregdp* is expected to

be negatively related to the Gini coefficient, whereas *govexpenditurepc* is expected to be positively related with income.

Independent control variable - Investment into fixed assets

Previous research has indicated that the level of investment into fixed assets influences the level of inequality. Large variations in government investment into fixed assets between provinces might therefore be one explanation for China's high levels of interprovincial inequality. Therefore, a variable for investment into fixed assets has been included in both models. The level of investment into fixed assets is estimated by total government investment into fixed assets. Ideally the variable would be based on total domestic investment, however, that is not possible due to data limitations. The variable *investmentgdp* that is used in model one, is calculated as a ratio of provincial GDP, and measures in percentage. The second variable *investmentpc* that is used in model two, is a numeric term measuring the amount of Yuan invested in the province, per capita.

Independent control variable – agricultural labour force

There are high levels of within rural income inequality in China, with large income difference between people working in agriculture and people working in other sectors. The proportion of the rural labour force engaged in agricultural activities varies vastly between provinces, and are influencing the provincial average rural income. Therefore, a control variable for agriculture is included in model two. The variable is calculated as a ratio of the total rural labour force that is engaged in agricultural activities, including agriculture, forestry, fishing and animal husbandry. The variable is referred to as *agriculture,* and is measured in percentage. One limitation to this variable is that, statistical information on the percentage of the rural workforce engaged in agricultural activities can be misleading because of the Chinese labour market division. Many migrant labourers might work part of the year on the farm, and it is not clear how they are counted in the statistics. Furthermore, do many people do have multiple sources of income and work, and agricultural activities might only be one out of multiple jobs. This being said, based on the background research *agriculture* is expected to be negatively related to the variable *lgincome*.

Independent control variable - Rural-urban labour ratio

Differences in rural and urban income levels are one of the main contributors to the growing level of income inequality in China. The ratio of the urban to rural population is, therefore, an important variable when analysing inter-provincial inequality level, and is included as a control variable in both models. Ideally the variable would be calculated based on the rural and urban provincial population, but as a result of data limitations, the variable is estimated based on the rural urban labour ratio. The variable is in the models referred to as *urbanworkers,* and is calculated as the percentage of urban workers to the total provincial workforce. Based on the background discussion in chapter 2, the variable *urbanworkers* is expected to be positively related to both income and the Gini coefficient.

4.4 Model specification

Model 1:

$$Gini_{tn} = \alpha + \beta_1 FDIgdp_{tn} + \beta_2 lgGDPpc_{tn} + \beta_3 GDPpercapita2_{tn} + \beta_4 Investmentgdp_{tn} + \beta_5 GovExpendituregdp_{tn} + \beta_6 tradegdp_{tn} + \beta_7\ urbanworkers_{tn} + u_{it} + \varepsilon_i$$

Model 2:

$$lgincome_{tn} = \alpha + \beta_1 FDIpc_{tn} + \beta_2 Investmentpc_{tn} + \beta_3 GovExpenditurepc_{tn} + \beta_4 urbanworkers_{tn} + \beta_5 agriculture_{tn} + u_{it} + \varepsilon_i$$

Model 1 will be used to answer the first hypothesis, proposing that there is a positive relationship between the inflow of FDI and the Gini coefficient. The hypothesis implies that the presence of FDI increases the level of regional inequality in China. Model 2 will be conducted in order to answer the second hypothesis, proposing that there is a positive relationship between inter-provincial income inequality and FDI. The hypothesis implies that the presence of FDI increases the level of inter-provincial income inequality in China. Since a panel dataset is used for the analysis each variable has a double index, i indicates the cross sectional aspect, and t the time aspect, and because panel data is two dimensional, the model includes two error terms, $\mathbf{u_{it}}$ and $\boldsymbol{\varepsilon_i}$.

5. Robustness and Results

This section will start with discussing the overall robustness of the empirical analysis, followed by a presentation and discussion of the results of the fixed effects regression, for both models. The discussion will relate back to the expected signs of each variable presented in chapter 4. The chapter will also provide a discussion regarding some of the possible limitations to the models and present some concluding remarks.

5.1 Robustness

To control the robustness of the empirical results of both models, a number of tests have been conducted, starting with the Hausman specification test. The Hausman test is conducted to determine if the fixed effects method (FE) or the random effects method (RM) is the most suitable method for this panel data set. The Hausman test checks if the unique errors (u_i) are correlated, and the null hypothesis states that the unique errors are not related. The test results for both model one and model two show that, we fail to reject the null hypothesis for both models, though the Prob>chi2 value is less than 0.05 (table 6 for model 1 and table 10 for model 2 in appendix). The Hausman test can thereby confirm that the fixed effects methodology is the most suitable method for this panel dataset.

After the Hausman test, the following procedures were implemented to check the overall robustness of the empirical results for both models. The models are controlled for heteroskedaticity, autocorrelation and cross sectional dependence, with help of the modified Wald test for groupwise heterosketaticity, the Wooldridge test for autocorrelation in panel data and the Pasaran CD test for cross-sectional dependence. Furthermore, the models were checked for fixed time effects, and finally three regression methods was preformed (*xtreg with fe, OLS with dummies and areg*) to double-check the estimated coefficients and R-square. The three methods provided equal results for the coefficients and the R-square for both models, indicating that the chosen method provides reliable results (table 8 and 12 in appendix).

5.2 Results

The regression outcome for model 1 indicates that the presence of FDI indeed is positively related with the Gini coefficient, which implies that a higher ratio of FDI to the provincial GDP increase the Gini coefficient. FDI can therefore be argued to have a negative impact on provincial inequality, however, the results do not provide any information regarding the direction of the causality. This means that we fail to reject the first null-hypothesis, stating that presence of FDI is positively related with the Gini coefficient in China.

The results from the fixed effects regression do also show that the relationship between GDP per capita and the Gini coefficient, are consistent with the theory of the Kuznets' curve discussed above. The results indicate that an increasing GDP per capita first is positively related to an increasing Gini coefficient, however, after a certain point does the relationship changes, as variable *GDPpercapita2* is negatively related to the Gini coefficient. Furthermore, the results do confirm that a higher rate of investment to provincial GDP, as well as, local government expenditure have a negative effect on the Gini coefficient, and are therefore good measures to implement to decrease the level of inequality. Total provincial trade as a ratio of provincial GDP (*tradegdp),* is as expected based on the discussion on trade an inequality above, positively related to the Gini coefficient. This result implies that the increasing presence of trade reflects negatively upon the inequality level in China. This is likely to be a result of the large variations in the ratio of trade between provinces, as described above.

The variable *Urbanworkers,* which in this essay represents the proportion of the total provincial labour force being urban workers, are negatively related to the Gini coefficient. This result can be interpreted as that, the higher proportion of the total workforce being urban the lower the inequality rates. This result is consistent with the high levels of rural urban income inequality, as discussed above, and reflects upon the close connection between urban rural and inter provincial inequality.

Table 1) Fixed effects regression model 1 - dependent variable *Gini*

R-square = 0.5880		
Gini	**Coef.**	**Std. Err.**
FDIgdp	0.0950437***	0.0294647
lgGDPpc	0.0138085***	0.0012224
GDPpercapita2	-1.37e-11***	1.02E-12
investmentgdp	-0.0881732***	0.0059298
tradegdp	0.0046502*	0.002364
govexpenditurегdp	-0.0549832***	0.0118059
urbanworkers	-0.089322***	0.0125155
_cons	0.2603468***	0.0106711

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note: ***p<0.01 **p<0.05 *p<0.1; A more detailed table of the FE regression output to be found in appendix table 5; Gini coefficient calculated by author based on data from China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'

The results from the fixed effects regression, for the second model, indicate that there are indeed a significant positive relationship between FDI per capita and the average income. This implies that provinces that have a higher rate of FDI per capita, also have a higher average income. Though the presence of FDI varies drastically between provinces, it can have an impact on broader regional inequality. On the other hand, the causality can be opposite and higher levels of income might be the reason for a higher presence of FDI in the province. The results do also confirm that, a higher proportion of the rural labour force engaged in agricultural activities the smaller the average income. This is consistent with theory and concerns regarding the rural urban divide, and in particularly with the income divide between people engaged in agricultural actives and the rest of the population. Once again, this can indirectly affect the broader inter provincial inequality levels, though the percentage of the labour force that is engaged in agricultural activities varies across provinces.

The level of investment into fixed assets (*investmentpc*) and the rate of local government expenditure (*govexpenditurepc*) are both, as can be expected based on the theory, positively related to income. These results go hand in hand with the theory presented above, suggesting that increasing investments and government expenditure on education, healthcare and other

areas are positively related to the average income. The results do furthermore suggest that, the government's effort to increase the level of investment and expenditure in the inland provinces has been a successful measure to increasing the average income in the region. The regression shows that the variable *urbanworkers* is negatively related to the average income, this result goes against the pre-regression expectations. The result implies that a higher percentage of the total workforce being urban workers, the lower the average income. This result is surprising taking into consideration the large divide between rural-urban incomes, and might be a result of factors not controlled for in the model such as education, gender, experience or ethnicity.

Table 2) Fixed Effects Regression model 2 - dependent variable *lgincome*

R-sq: within = 0.8680		
Lgincome	**Coef.**	**Std. Err.**
FDIpc	0.0000827**	0.0000339
Agriculture	-4.770672***	0.1985048
urbanworkers	-2.112898***	0.2489292
investmentpc	0.0000161***	3.95e-06
Govexpenditurepc	0.0000448***	8.43e-06
constant	11.78519***	0.1600251

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note: ***p<0.01 **p<0.05 *p<0.1; A more detailed table of the FE regression output to be found in appendix table 5

5.3 Limitations to the models

There are multiple limitations to the models that, might influence the results. One limitation to the models is that, they do not take into consideration constant geographical differences between the provinces, including, but not limited to, climate, size, distance to the coast and disease climate. Furthermore, the models do not consider political factors that might vary between China's provinces. Another limitation is that, there are no variable for human capital or education included in either model. As discussed in chapter 2, education has an increasingly large impact on wage and inequality, and education has also shown in previous

research to be closely linked to the impact FDI has on income inequality. It had, therefore, been beneficial to include a control variable for education, unfortunately that was not possible due to data limitations.

Furthermore, as mentioned in the discussion of GDP per capita, the model does not consider price difference between or within provinces, and it does not provide any information regarding micro level inequality. Finally, it have been suggested that the quality and consistency of the data might be poor, and the fact that the data is provided by the Chinese government might impact on which data that is published and which data that is not. This being said, the data from the Chinese statistical bureau is the data used as a base for most international organizations, and it is suggested being the most accurate data available on China.

5.4 Concluding remarks

This essay examines the association between provincial inequality in China and the presence of FDI, over the period of 1992 to 2010. More specifically, the essay does through the means of an empirical analysis attempt to link together the two concepts of inequality and FDI, in the context of China. The study can based on the empirical analysis conclude that 'we' fail to reject both hypothesis. This is the case because, the fixed effects regression for the first model indicated that the presence of FDI is positively related to the Gini coefficient, implying that the inflow of FDI into China has a negative impact on the country's level of inter-provincial inequality.

Furthermore, do the fixed effects regression for the second model indicate that the presence of FDI is positively related with income. Which implies that a higher inflow of FDI into a province, translates into a higher average income within that province. FDI does thereby impact on the regional income distribution within China, though the distribution of FDI across the country is extremely uneven. This finding is consistent with previous research showing that it is the unequal distribution of and not the presence of FDI that might have a negative impact on a country's levels of inequality. However, as discussed in the theory and background section, income inequality is a very complex topic, with no one single underlying reason or cure. This essay have focused on analysing if the increasing presence of FDI in the Chinese economy impacts on variations in the average income across provinces and well as

how it impacts on the Gini coefficient, concluding that the presence of FDI is positively related to both entities.

Finally, some ideas for further research based on the results from this analysis. This essay do not provide any information regarding if FDI has any impact on the within provincial distribution. This is a topic less explored in the literature, and as the 'within group' inequality is estimated to be increasing, this is an interesting topic for further research.

Appendix:

Table 3) Data Specification for both models

Work-file structure:	Panel - Time
Indices:	Province * Year
Panel dimensions:	29*19 (n=29 and T=19)
Range:	1992-2010*29 = 551 observations (N = 551)

Table 4)Variable Definition List

Variable Name	Definition	Measurement	Expected sign in regression
Gini	Gini coefficient is calculated based on provincial GDP per capita	Measured on a scale from 0 to 1	
Lgincome	Average yearly income, calculated as an average of urban and rural income.	Measured in Yuan per person	
FDIgdp	FDI inflow as a share of GDP	Measured in percentage	+
FDIpc	Calculated as inflow of FDI per capita in Yuan per capita	Measured in Yuan per person	+
lgGDPpc	GDP per capita in logarithm form	Measured in Yuan per person, in logged values	+
GDPpercapita2	GDP per capita in logarithm form squared	Measured in Yuan per person, in squared values	-
investmentgdp	Investment into fixed assets as a percentage of GDP	Measured in percentage	+
Investmnetpc	Calculated as total investment into fixed assets per capita	Measured in Yuan per person	+
govexpendituregdp	Local government expenditure as a percentage of GDP	Measured in percentage	+
govexpenditurepc	Calculated as local government	Measured in Yuan per person	+

	expenditure per capita		
Tradegdp	Trade as a percentage of GDP	Measured in percentage	+
Urbanworkers	The ratio of urban laborer to all laborer in the province	Measured in percentage	+
Agriculture	Percentage of the rural labor force working in agriculture	Measured in percentage	-

*Note: Values for trade, and FDI are recalculated from USD into RMB using exchange rate table from the statistical yearbook; All ratios are calculated based on the total provincial GDP given in the Chinese statistical yearbooks; All per capita calculations are based on provincial population statistics from the Chinese statistical yearbooks

Table 5) Descriptive statistics model 1

Variable		Mean	Std. Dev.	Min	Max
province*	overall	15	8.374203	1	29
	between		8.514693	1	29
	within		0	15	15
Year	overall	2001	5.482203	1992	2010
	between		0	2001	2001
	within		5.482203	1992	2010
Gini	overall	0.3095789	0.0159066	0.27	0.33
	between		0	0.3095789	0.3095789
	within		0.0159066	0.27	0.33
FDIgdp	overall	0.0282778	0.0308937	0.0000156	0.1945561
	between		0.0261586	0.0028579	0.0876466
	within		0.0171038	-0.0293548	0.1385462
lgGDPpc	overall	9.064775	0.897966	6.94119	11.23946
	between		0.523355	8.144857	10.3501
	within		0.7358033	7.483616	10.73718
GDPpercapita2	overall	3.34E+08	7.53E+08	1069156	5.79E+09
	between		4.38E+08	3.21E+07	1.79E+09
	within		6.17E+08	-1.39E+09	4.51E+09
govexpendituregdp	overall	0.1667563	0.127339	0.0491712	1.085879
	between		0.1174387	0.0767702	0.6988593
	within		0.0536165	-0.0375406	0.5537757
investmentgdp	overall	0.4274877	0.1512022	0.2181256	0.9339422
	between		0.0671818	0.3283048	0.6318537
	within		0.1360015	0.1960545	0.9373025
tradegdp	overall	0.2898201	0.397313	0.0320736	3.687655
	between		0.3367324	0.0510036	1.388
	within		0.2194989	-0.3205943	3.626036
urbanworkers	overall	0.3195729	0.1633617	0.114963	0.851756
	between		0.1614928	0.1318596	0.7590287
	within		0.0382184	0.1674344	0.4628805

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note: * indicates encoded string variable; Gini coefficient is calculated by author based on macro level provincial GDP per capita data from China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'

Table 6) The Hausman test for model 1

	Coefficients		
	Fixed (b)	**Random (B)**	**b-B Difference**
FDIgdp	0.0950437	0.0105158	0.0845279
lgGDPpc	0.0138085	0.0069442	0.0068643
GDPpercapita2	-1.37e-11	-1.25e-11	-1.11E-12
investmentgdp	-0.0881732	-0.0682257	-0.0199474
govexpendituregdp	-0.0549832	0.0217853	-0.0767685
Tradegdp	0.0046502	0.001721	0.0029292
urbanworkers	-0.089322	0.003497	-0.092819
Ho: difference in coefficients not systematic			
Chi2(6) = 152.60			
Prob>Chi2 = 0.000			
Dependent Variable: Gini			

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'

Table 7) Fixed Effects Regression model 1 – dependent variable *Gini*

Group variable: province	
R-sq: within = 0.5880	Number of obs = 551
between = .	Number of groups = 19
overall = 0.1831	Obs. per group = 29
	F(7,515) = 104.99
corr(u_i, Xb) = -0.8298	Prob > F = 0.000

Gini	**Coef.**	**Std. Err.**
FDIgdp	0.0950437***	0.0294647
lgGDPpc	0.0138085***	0.0012224
GDPpercapita2	-1.37e-11***	1.02E-12
investmentgdp	-0.0881732***	0.0059298
tradegdp	0.0046502*	0.002364
govexpendituregdp	-0.0549832***	0.0118059
urbanworkers	-0.089322***	0.0125155
_cons	0.2603468***	0.0106711

sigma_u .0184389
sigma_e .01055161
rho .75331429
F test that all u_i=0: F(28, 515) = 8.61
Prob > F = 0.0000

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note: ***p<0.01 **p<0.05 *p<0.1

Table 8) Comparison of regression models for model 1 – dependent variable *Gini*

R-square = 0.5880

Variable	**Fixed Effects**	**OLS**	**Areg**
FDIgdp	0.09504368**	0.09504368**	0.09504368**
lgGDPpc	0.01380848***	0.01380848***	0.01380848***
GDPpercapita2	-1.365e-11***	-1.365e-11***	-1.365e-11***
investmentgdp	-0.08817318***	-0.08817318***	-0.08817318***
govexpendituregdp	-0.05498317***	-0.05498317***	-0.05498317***
tradegdp	0.00465021*	0.00465024*	0.00465024*
urbanworkers	-0.08932198***	-0.08932198***	-.08932198***
constant	0.26034681***	0.25021527***	0.26034681***

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note. *p<0.05, **p<0.01, ***p<0.001; provinces are not reported in table above

Table 9) Descriptive statistics model 2

Observations**
N = 551
n = 29
T = 19

Variable		Mean	Std. Dev.	Min	Max
province*	overall	15	8.374203	1	29
	between		8.514693	1	29
	within		0	15	15
Year	overall	2001	5.482203	1992	2010
	between		0	2001	2001
	within		5.482203	1992	2010
lgincome	overall	8.210406	0.6390813	6.73801	9.862581
	between		0.256722	7.939392	8.86681
	within		0.5870909	6.861022	9.358701
FDIpc	overall	465.9877	749.3233	0.0646742	5652.349
	between		628.4329	15.9975	2325.113
	within		423.6536	-1588.019	3925.7
agriculture	overall	0.6568832	0.1649614	0.1728679	0.9454148
	between		0.1484988	0.2742501	0.8734831
	within		0.0766945	0.4434153	0.8546373
urbanworkers	overall	0.3195729	0.1633617	0.114963	0.851756
	between		0.1614928	0.1318596	0.7590287
	within		0.0382184	0.1674344	0.4628805
govexpenditurepc	overall	2154.051	2593.6	111.7294	18354.54
	between		1333.769	1010.616	5914.162
	within		2237.418	-3053.865	15066.37
investmentpc	overall	6159.373	6883.622	234.5135	48319.47
	between		3093.83	2291.342	14482.87
	within		6174.603	-5666.399	41566.38

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note: * encoded from a string variable; **Observations in terms of both n and T are equal for the whole sample, which implies that N also is equal for all variables

Table 10) The Hausman test for model 2

	Coefficients		
	Fixed (b)	**Random (B)**	**b-B Difference**
FDIgdp	0.0000827	-0.0000496	0.0001323
agriculture	-4.770672	-3.08776	-1.682912
investmentgdp	0.0000161	0.000313	-0.0000152
govexpenditurегdp	0.0000448	0.0000652	-0.0000204
urbanworkers	-2.112898	-1.573692	-0.5392052
Ho: difference in coefficients not systematic			
Chi2(6) = 260.39			
Prob > Chi2 = 0.000			
Dependent Variable: lgincome			

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'

Table 11) Fixed Effects Regression model 2 – dependent variable *lgincome*

Group variable: province	
R-sq: within = 0.8680	Number of obs = 551
between = 0.5718	Number of groups = 19
overall = 0.5998	Obs. per group = 29
	F(5,517) = 679.66
corr(u_i, Xb) = -0.7292	Prob > F = 0.0000

lgincome	**Coef.**	**Std. Err.**
FDIpc	0.0000827**	0.0000339
agriculture	-4.770672***	0.1985048
urbanworkers	-2.112898***	0.2489292
investmentpc	0.0000161***	3.95e-06
govexpenditurepc	0.0000448***	8.43e-06
constant	11.78519***	0.1600251

sigma_u = 0.51032721
sigma_e = 0.22004103
rho = 0.84323213
F test that all u_i=0: F(28, 517) = 19.79
Prob > F = 0.0000

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note: ***p<0.01 **p<0.05 *p<0.1

Table 12) Comparison regression models for model 2 – dependent variable l*gincome*

R-square = 0.8680

Variable	**Fixed Effects**	**OLS**	**areg**
FDIpc	0.00008273*	0.00008273*	0.00008273*
investmentpc	0.00001609***	0.00001609***	0.00001609***
govexpenditurepc	0.00004481***	0.00004481***	0.00004481***
urbanworkers	-2.1128976***	-2.1128976***	-2.1128976***
agriculture	-4.7706722***	-4.7706722***	-4.7706722***
constant	11.785188***	11.505155***	11.785188***

Source: China statistical yearbooks, various years and 'China Yearly Provincial Macro-Economics Statistics'
Note. *p<0.05, **p<0.01, ***p<0.001; provinces are not reported in table above

Bibliography:

Alfaro Laura and Rodriguez-Clare Andres, (2004), "*Multinationals and linkages: Evidence from Latin America"*, Economics, Vol. 4, No. 2, pp. 113-170

Appleton Simon, Song Lina, and Xia Qingjie, (2013), "*Understanding urban wage inequality in China 1988-2008: Evidence from Quantile Analysis", China Growth Centre (CGC), CGC Discussion Paper Series, No. 18, February 2013, Oxford*

Appleton Simon, Song Lina, and Xia Qingjie, (2005), "*Has China crossed the river? The evolution of wage structure in urban china during reform and retrenchment"*, Journal of Comparative Economics, Vol. 33, No. 4, pp. 644-663

Ash Robert, (2006), *"The long-term outlook for economics reform in China: resource constraints, inequalities and sustainability"*, Asian Europe Journal, Vol. 4, No. 2, pp. 177-196

Asteriou Dimitrios and Hall Stephen G., (2011), "*Applied Econometrics, second edition"*, Palgrave MacMillian, London

Barrow Michael, (2009), "*Statistics for Economics, Accounting and Business studies, fifth edition"*, Pearson Education Limited, England

Branstetter Lee G. and Feenstra Robert C., (2002), "*Trade and foreign direct investment in China: a political economy approach"*, Journal of International Economics, Vol. 58, No. 2, pp. 335-358

Cai Fang, Wang Dewen, Du Yang, (2002), *"Regional Disparity and Economic Growth in China: The Impact of Labor Market Distortions"*, China Economic Review, No. 13, pp. 197-212.

Chen Chung, Chang Lawrence and Zhang Yimin, (1995), "*The role of foreign direct investment in China's Post-1978 economic development"*, World Development, Vol. 23, No. 4, pp. 691-703

China.org.cn, (2014), "*China questions and answers"*, accessed from www.china.org.cn/english/features on 24-07-2014

China.org.cn, (2009), "*Household responsibility system"*, accessed from http://www.china.org.cn/features/60years/2009-09/16/content_18534697.htm on 26-07-2014

CSIS, (2014), "*China economic reform timeline*", Center for Strategic and International studies (CSIS), Washington, accessed from www.csis.org/china-economic-reform-timeline, on 12-07-2014

Demurger Sylvie, (2001), "*Infrastructure Development and Economic Growth: An Explanation for Regional Disparities in China*", Journal of Comparative Economics, Vol, 29, No. 1, pp. 95-117.

Dollar David and Kraay Aart, (2002), ”*Growth is good for the poor*”, World Bank Policy Research Working Papers Seies, No. 2587, The World Bank

Dutta Nabamita and Osei-Yeboah Kwasi, (2013), “*A new dimension of the relationship between foreign direct investment and human capital: The role of political and civil rights”,* Journal of International Development, Vol. 25, No. 2, pp. 160.179

Fang Hai and Rizzo John A. (2011), “*Income inequality dynamics in rural China from 1991 to 2006: the role of alternative income sources”,* Applied Economics Letter, Vol. 18, No. 14, pp. 1307-1320

Fleisher Belton, Li Haizheng and Zhao Min Qiang, (2008), “*Human Capital, Economic Growth, and Regional Inequality in China*”,IZA Discussion Paper series, IZA DP No. 3576, Germany

Franco Chiara and Gerussi Elisa, (2012), *“Trade, foreign direct investments (FDI) and income inequality: Empirical evidence from transition countries”,* The journal of international trade and economic development: an international and comparative review, Vol. 22, No. 8, pp. 1131-1160

Fu Xiaolan, (2004), ”*Limited Linkages from Growth Engines and Regional Disparities in China*”, Journal of Comparative Economics, Vol. 32, No. 1, pp. 148-164

Fujita Masahida and Hu Depeng, (2001), ”*Regional Disparity in China 1985—1994: the Effects of Globalization and Economic Liberalization”,* Annals of Regional Science, Vol. 35, pp. 3-37.

Fujita Masahida and Hu Depeng, (2001), ”*The effects of globalization and economic liberalization”,* Annals of Regional Science, Vol. 35, No. 1, pp. 3-37

Gan Li, (2013), *“Income inequality and consumption in China”*, Texas A&M University, USA

Girma Sourafel and Görg Holger, (2007), “*Evaluating the foreign ownership wage premium using a difference-in-difference matching approach”,* Journal of International Economics, Vol. 72, No. 1, pp. 97-112

Hemmer Hans-Rimbert, Kruger Ralf and Seith Jennifer (2005), “*Foreign Direct Investment and Income inequality revisited”,* Institute for Development Economics, Working Paper No. 32

Heyman Fredrik, Sjoholm Fredrik and Tingvall Patrik G., (2007), “*Is there really a foreign ownership wage premium? Evidence from matched employer-employee data*”, Journal of International Economics, Vol. 73, No. 2, pp. 355-376.

Investopedia, (2014), “*Definition of Foreign Direct Investment (FDI)”,* Investopedia, accessed from www.investopedia,com/terms/fdi accessed on 06-07-2014

Investopedia, (2014), “*Definition of Special Economic Zone (SEZ)”,* Investopedia,

accessed from www.investopedia.com/terms/sez accessed on 06-07-2014

Jensen Nathan M., and Rosas Guillermo, (2007), "*Foreign Direct Investment and Income Inequality in Mexico, 1990-2000*", International Organization, Vol. 61, No, 3. pp. 467-87.

Kanbur, Ravi, and Zhang, Xiaobo, (1999), "*Which regional inequality? The evolution of rural-urban and inland-coastal inequality in China from 1983 to 1995"*, Journal of Comparative Economics, 27(4), pp. 686-701

Kanbur, Ravi, and Zhang, Xiaobo, (2005), "*Fifty years of regional inequality in China: a journey through central planning, reform and openness"*, Review of Development Economics, Vol. 9, No. 1, pp. 87-106

Kennedy Simon, (2014), "*Income inequality most likely threat to world economy, WEF says"*, Bloomberg News, January 16, 2014, accessed from www.businessweek.com on 12-07-2013

King Whyte Martin, (2012), "*China's post-socialist inequality"*, Current History, Vol. 111, No. 746, pp. 229-234

Knight John, (2014), "*The economic cause and consequences of social instability in China"*, China and World Economy, Vol. 22 No. 2, pp. 5-21

Knight John, (2014), "*Inequality in China: an overview"*, The World Bank research Observer, Vol. 29, No. 1, pp. 1-19

Koch-Weser Iacob N., (2013), "*The Reliability of China's Economic Data: An Analysis of National Output"*, U.S. – China Economic and Security Review Commission Staff Research Project, January 2013, U.S. – China Economic and Security Review Commission, accessed from http://www.uscc.gov/sites/default/files/Research/TheReliabilityofChina'sEconomicData.pdf on 23-07-2014

Kuznets Simon,(1955), "*Economic Growth and Income inequality*", American Economic review, Vol. 45, No. 1, pp.1-28

KPMG, (2010), "*Education in China"*, KPMG Infrastructure, Government and Healthcare report 2010, accessed from http://www.kpmg.de/docs/Education-in-China-201011.pdf on 02-07-2014

Krueger Dirk and Perri Fabrizio, (2005), "*Does Income Inequality Lead to Comsumption Inequality? Evidence and Theory"*, Review of Economic Studies, Vol. 73, Issue. 1, pp. 163-193

Lee Shao-Wei, (2010), "*The impact of outward-oriented economic reforms on income inequality in China"*, Doctor of Philosophy thesis, School of Economics, University of Wollongong, Australia, accessed from http://ro.uow.edu.ac/thesis/3178 on 07-07-2014

Lin Shu-Chin, Kim Dong-Hyeon and Wu Yi-Chen, (2013), "*Foreign direct investment and income inequality: Human capital matters"*, Journal of Regional Science, Vol. 53, No. 5, pp. 874-896

Lin Justin Yifu and Liu Zhiqiang, (2000), "*Fiscal decentralization and economic growth in China"*, Economic Development and Cultural Change, Vol. 49, No. 1, pp. 1-21

Lipsey Robert E. and Sjoholm Fredrik, (2002), "*Foreign firms an Indonesian manufacturing wages: an analysis with panel data"*, NBER Working Paper, No. 9417

Luo Xubei and Zhu Nong, (2008), *Rising income inequality in China: a race to the top"*, Policy Research Working Paper No. 4700, The World Bank East Asia and Pacific Region Poverty Reduction and Economic Management Department

Luo You, (2008), "*Discrimination in China's urban labor market"*, Doctoral Dissertation, Jilin University 2008, China

Ma Doris and Summers Tim, (2009), "*Is China's growth moving inland? A decade of 'Develop the West'"*, Asia Programme paper: ASP PP 2009/02, Chatham House, London

Mukhopadhaya Pundarik, (2013), "*Trend in income inequality in China: the effects of various sources of income"*, Journal of the Asian Pacific Economy, Vo. 18, No. 2, pp. 304-317

Mundell Robert A., (1957), "*International trade and factor mobility"*, American Economic review, Vol. 47, No. 3, pp. 321-335

National Bureau of statistics (NBS), (2014) "*China Yearly Provincial Macro-Economics Statistics"* China statistics Press, Beijing, accessed from www.chinadataonline.org on 10-07-2014

National Bureau of statistics (NBS), (2011), "China Statistical Yearbook 2011", China statistics Press, Beijing, accessed from www.chinadataonline.org on 10-07-2014

National Bureau of statistics (NBS), (2009), "China Statistical Yearbook 2009", China statistics Press, Beijing, accessed from www.chinadataonline.org on 10-07-2014

National Bureau of statistics (NBS), (1993), "China Statistical Yearbook 1993", China statistics Press, Beijing, accessed from www.chinadataonline.org on 10-07-2014

National Bureau of statistics (NBS), (1991), "China Statistical Yearbook 1991", China statistics Press, Beijing, accessed from www.chinadataonline.org on 10-07-2014

Naughton Barry, (2007), "*The Chinese Economy: Transition and Growth"*, The MIT Press, Cambridge, Massachusetts

Nunnenkamp Peter and Stracke Rudi, (2007), "*Foreign Direct Investment in Port-reform India: Likely to work wonders for regional development?"*, Kiel Institute of World Economics, Working Paper No. 102, 2007

OECD, (2012), "*Reducing income inequality while boosting economic growth: Can it be done?",* Economic Policy Reforms 2012 Going for Growth, OECD, accessed from www.oecd.org on 27-06-2014

OECD, (2012), "*Income inequality and growth: the role of taxes and transfers",* Economics Department Policy Note No. 9, January 2012, Accessed from http://www.oecd.org/eco/public-finance/49417295.pdf, on 12-07-2014

Orlik Tom, (2011), "*Understanding China's Economic Indicators: Translating the data into investment opportunities",* Financial Times, Prentice Hall, USA

Ouyang Puman, (2009), "*Economic Growth, Industrial Development and Inter-regional Spillover from Foreign Direct Investment: Evidence from China",* Syracuse University, New York, USA

Qiu Larry D., Li Jie and Sun Qunyan, (2003), "*Interregional Protection of Fiscal Decentralization and Trade Liberalization*", China Economic Review, Vol. 14, No. 3, pp. 227-245.

Su Biwei and Heshmati Almas, (2011), "*Analysis of gender wage differential in China's urban labor market",* Discussion Paper No. 6252, The Institute of the study of labor (IZA), Bonn

Sun Haishun and Chai Joseph, (1998), "*Direct foreign investment and inter-regional economic disparity in China",* International Journal of Social Economics, Vol. 25, No. 2, pp. 424-447

Tang Sumei and Saroja Selvanathan, (2005), "*Foreign direct investment and regional inequality in China",* Griffith University, Queensland, Australia

Te Velde Dirk W. and Zenogiani Theodora, (2007), "*Foreign direct investment and interational skill inequality",* Oxford Development Studies, No. 35, pp. 83-104

Economics Online, (2014), "*Inequality and equity",* accessed from www.economicsonline.co.uk/Managing_the_economy/Inequality_and_equity.html on 20-07-2014

The Economic Times, "Definition of 'Human Development index', The Economic Times, accessed from http://economictimes.indiatimes.com/definition/Human-Development-Index on 01-08-2014

Todaro Michael P. and Smith Stephen C., (2009), "Economic Development, tenth edition", Addison Wesley, Pearson Education, England

Wei Kailei, Yao Shujie and Liu Aying, (2007), "*Foreign direct investment and regional inequality in China",* Research Paper Series China and the World Economy, No. 32, GEP Leverhulme Centre for Research on globalisation and economic policy

Wei Yehua Dennis, (2002), "*Multiscale and Multimechanisms of regional inequality in China: Implications for regional policy",* Journal of Contemporary China, Vol. 11, No. 30, pp. 109-124

World Bank, (2014), "*Gini Index*", The World Bank Data, accessed from http://data.worldbank.org/indicator/SI.POV.GINI on 02-07-2014

World Bank, (2000), "*World Development Report, 2000*", Oxford University Press, New York

Yang, D. T., (2002), "*What Has Cuased Regional Inequality in China?",* China Economic Review, No. 13, pp. 331-334.

Young Alwyn, (2000), "*The Razor's Edge: Distortions and incremental Reform in the People's Republic of China*", Quarterly Journal of Economics", Vol. 115, No. 4, pp. 1091-1135.

Zhang Xiaobo and Zhang Kevin H., (2003), "*How does globalisation affect regional inequality within a developing country? Evidence from China",* Journal of Development Studies, Vol. 39, No. 4, pp. 47-67

Zhang Qinghua and Zou Heng-Fu, (2012), "*Regional Inequality in Contemporary China",* Annalys of Economics and Finance, Vol. 13, No. 1, pp. 113-137