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Impacts of Foreign Direct Investment on Economic Growth in China

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Abstract: Impacts of inward FDI on economic growth are assessed in the case of large developing countries, China and India. The underlying analytical structure is based on the Solow model. FDI complements to main factors of production, labour and capital and leads to GDP growth. Comprehensive evidence-based suggestions are provided that can be useful for making policies that spur the long-term growth for the benefit of all people in such emerging economies.

Keywords: FDI, growth, China, India

JEL Classification: F21, F6, O1 and P2

Introduction

Foreign direct investment often happens when a Multinational Company (MNC) controls and produces its products by operating in more than one country. In recent years, as globalisation becomes more popular, MNCs play key roles in FDI around the globe. Each country likes to bring FDI and be a host country. This process has become one of the key engines that drives economic growth. It has been successful, particularly in East Asia. In this essay, we will analyse how the FDI impacts economic growth. We take the case of China, which is one of the biggest developing countries in the world and has been an example for analysis and investigation of growth and FDI. Moreover, this research essay uses underlying structure of the Solow Model for

analysing the FDI's effects on the macroeconomy and in different sectors, which are the main factors covered in the model as capital, human resources and technology. Then it uses a microeconomic model of a multinational company to analyze the microeconomic effects of FDI. Detailed analysis and results will be presented and discussed for each factor to see how the economies can be affected by these factors and how FDI can influence these factors that lead to economic growth. China, as a developing country which had significant economic growth in recent years, is a good case study example and was taken as the investigation target in this research.

The Policy of FDI in China

Any investment from a multinational company that is set up with part or full ownership by foreigners can be considered a foreign direct investment in China. Since 1990, the government of China has adopted an open-door policy to the world, and the government encourages foreign companies to bring in technology, capital investment to the Chinese market. Long (2003) describes that, from 1993, China had become among the top countries to attract the largest amount of FDI inflows. For the last 30 years, China has aggressively reshaped a complete range of laws, regulations that govern foreign investment. The government also set up special economic zones in various parts of the country to attract more FDI and provide a flexible policy to encourage FDI inflow by MNCs. This policy has been well supported and contributed to the rate of economic growth directly or indirectly. Detailly, during the period from 1990 to 2020, it shows that more than 70-80% FDI inflows went to the manufacturing sector, and this has created long-term opportunities for China. Now it has become a world hub of factories. Lately, from the period after China joined the World Trade Organisation (WTO) in 2002, there are some policy changes. Research from Davies (2013) points out that China remains the biggest market that attracts FDI after 2008's financial crisis and MNCs still feel confident with economic growth in China. The service sector's FDI growth is faster than that of the manufacturing sector during that period. Together with the policy change, as "The Chinese government has taken several measures to streamline foreign investment administration since the publication of the 2008 OECD Investment Policy Review of China. Several changes in the foreign investment administration regime were announced in a circular of the State Council, China's cabinet, on 6 April 2010, including the raising of the ceiling on provincial examination and approval

of authority over foreign investment projects in the "permitted catalogue". In other words, the Chinese government has tried to change the policy in order to protect some of the state-owned companies and important sectors. Moreover, in recent years, the Foreign Investment Law, the National Security Law of PRC in 2015 and the security review measure came into effect in 2021 (EIU (2023)). All these changes in policy show that the National Development of Reform Commission and the Ministry of Commerce work together to take charge of national economic security, try to balance the FDI and economic security for China. However, because of the market size of China, it can still attract more amount of FDI compared with almost all the other developing countries in the world. In general, China seems to have the most liberal and open policy in FDI in the last 30 years, in which now the data from PwC (2022) reported that, "MNCs are most attracted to China's market and economic growth as 70% of participants reported that they were most optimistic about China's "market" and "growth". " and with "Almost 60% of MNCs have plans to expand business in China in 1-3 years, among that, 91% of respondents say their primary objective is to "expand market/customer base for existing products/services". East and South China regions are their priority regional markets. Although there are some challenges such as "Talent recruitment and retentions, policy regulations, and IP protection are three major challenges facing MNCs in China". In other words these were challenges once, but now are solved for MNCs. There is still huge capacity for MNCs to get chance of business growth, making huge profits and getting other benefits from China's economic development in the next decade. Moreover, Wei, Xie and Zhang (2017) stated in their research that, between 1980-2015, the FDI inflow created increased productivity in industries that were not seen before. Also along with FDI, China seems to look for new way of economic development by making state-own firms' reform. This gives FDI and MNCs new opportunity to be part of Chinese economic growth in the next decade.

The overall objective of this chapter is to study the growth impacts of FDI from micro and macroeconomic perspectives.

2.1. The Impact of FDI on Economic Growth

Foreign direct investment is believed as a key tool to force economic growth both at city and country levels. FDI, which usually comes to the host country by bringing more multinational companies when these companies set up branches to operate

business in the host country. Such MNCs usually provide technology to local firms, increase employability in the area, increase capital investment in the area, also make the market more competitive, and increase productivity in the long run. Chen,Wang, Ning and Zhang (2023) and Wang, Ning and Zhang (2017) show in their research to support that "FDI spillovers have a positive and significant effect on technological upgrading within a host city". Also, it seems that "FDI received in one region exhibits spatial spillovers, positively affecting productivity growth in nearby cities. FDI spillovers are the key source of local technological productivity". On the other hand, when it comes to the microeconomics side, it can affect the single firm or business sector's production and because of the increase of productivity and change of human capital, such as a decreased human capital cost, which leads to more goods and services being produced in the sector in which these MNCs operate their business. Then it may change the way households' consumer habits in this area. It may change the structure of household savings and consumption. Generally, FDI's impact on economic growth looks very positive.

The Macroeconomics Theory of FDI

From a macroeconomics aspect, the determinations of FDI will include the size of the market in the host countries, economic growth rate, GDP, infrastructure, natural resources, also political stability. As Lipsey (2004) describes, these factors at the macroeconomic level attract FDI and make it a key form of flow of capital. These variables are developed according to how these factors affect the amount of FDI. As Makoni (2015) explained, theoretically, capital market theories are believed to be the first theory that explains FDI, which is based on Aliber (1971) research work. It is also known as "currency area theory". It pointed out that FDI is due to imperfections of the capital market, it is aimed to take advantage of currency in host countries and home countries to gain access to more sources of production for MNCs, and it is believed that a weaker currency attracts more FDI. Later, researchers try to explain FDI from the macroeconomic level or from a location-based approach. In which these researchers believed that firms considered FDI because they try to seek resources, market, efficiency or asset strategies, from the macroeconomic level, which affect the MNC's decision and FDI attraction. This is mainly considered as a geographical reason, also known as location-based, as Popovici and Calin (2014) describe in more detail. They explained that the success

of FDI raises the national wealth of a country, such as the endowment of natural resources, labour availability, size of the local market. Moreover, institutional FDI fitness theory that was developed by Wilhelms and Witter (1998) explained from the other side, the attraction of FDI may be due to the country's ability to satisfy internal and external investors' expectations. The main factors in the theory include government, market, educational and socio-cultural fitness. Which means the FDI is attracted by the government policy stability, socio-cultural fitness which may affect overseas operation, market environment, including financial and economic aspects, education level of people, which a human capital value. According to the outlines above, all theories confirm and support that a good macroeconomic environment determines the amount of FDI in an economy. Models are discussed in section 4.

3.1. The Microeconomics Theory of FDI

From the microeconomics level, Lipsey (2004) also stated that the motivation of FDI from investors' expectation will be like the firm level's perspective of decision making; in other words, it can be explained from microeconomic factors with theoretical support. According to Hymer (1960), MNCs make decisions to invest abroad because the firm wants to access raw material, economies of scale, low cost of transaction, labour, also "intangible assets in the form of brands and patents, amongst others", which is the fact at the firm level. Hymer's point of view has also been supported by other researchers' models, including Kindleberger (1969), who explained that in his imperfect market theory. The most common and well-known one that detailly FDI at the micro-level is the eclectic paradigm developed by Dunning (1980). That theory combines and develops all the previous models and theories. It is considered that there are three conditions that need to be fulfilled when the firm is making a decision for FDI. First is the firm should have an ownership advantage, the second is that the firm must be more profitable, the advantage of possessing net ownership together with high profitability leads to the third condition as the internalization condition. In other words, Boddewyn (1985) state that "the more a country's firms enjoy ownership advantages, the greater the incentive they must internalise them, and the more profitable to exploit them outside their home country, then the higher the probability of engaging in FDI and international production. Because of the interrelatedness of the three conditions, they must occur simultaneously, otherwise FDI cannot occur."

The Macro and Microeconomic Models Applied to FDI

According to the theories discussed above, the suitable model to be applied in the research is the Solow model, which is a classical economic growth model developed by Solow (1956), to be used for the analysis of long-run economic growth by considering capital accumulation, labour, and technology development. From macroeconomic view, FDI is considered as the key factors that increase economic growth, FDI is the main source to increase productivity which include improvement of technology, cause of capital inflow, lead to human capital and migrant mobility, in which the relationship can be showed in Solow growth model. Apply the Solow model for macroeconomic growth. The formula is presented as follows:

$$Y(t)=K(t)^{a}(A(t)L(t))^{1-a}$$

Here in formula Y represents total production, K is the capital, A is considered as labour augmenting knowledge or technology, and L is labour. Where t means time, $0 < a < 1$ is the elasticity of output with respect to capital.

To conduct an analysis of FDI's impact on macroeconomics, these models will be applied for analysis, which is the suitable model that can present all these key factors' relationship with macroeconomic growth and FDI.

From a microeconomic view, the satisfaction of consumers' consumption behaviour when they are consuming goods and services, which we know as utility. The utility function is the index measure of preference for consumers' behaviour and welfare from purchasing goods and services. Moreover, considering the business cycle model, along with the change in real GDP, and the macroeconomic environment, a firms need to consider its internal situation, as the external environment is out of the firm's control. In that case, firms need to use the external environment in a positive way, enhance their own competitiveness, productivity and market share while raising the growth rate of GDP. So that the firms can overcome the problem when the external economic environment is in a bad situation, according to the business cycle. However, because of FDI usually comes with MNCs, so in relationship with FDI and MNC's reflect to the microeconomic theory discussed previously. In this research, we assumed that there is a relationship that can be presented in the microeconomics model of multinational theory (Markusen (1995)) as follows:

$$R + D - FC < 2M - FC < 2R - FC$$

In this equation, R is the rental income from the licensing partner foreign firm, and D is the payment to the MNC from its partner in case of licensee defects in the second period. FC is the fixed cost for the MNC to consider FDI. M is the profit from the subsidiary when the FDI takes subsidiary operation. According to the formula above, it seems that if the licence agreement is not breached in the second period, a fully committed licence can be more profitable than a subsidiary operation. However, the profit for the MNC to sell the licence to host country firm defects on the agreement in the second year are less than if the MNC runs a subsidiary operation in the country. In another way, profit from subsidiary operation will be less compared with the situation if the licence agreement is implemented without defecting in the second period. As the main purpose of MNC is to maximise profit maximize, it would prefer licensing the operation of a subsidiary if it was guaranteed of full commitment. Such commitment, however, could be rare in the real world (Bhattarai and Negie (2020)).

To progress further analysis of the firm's FDI performance and microeconomic impact from FDI, so above theories would be applied in this research. It aims to find out the microeconomic effect that comes from FDI operations, the case in the middle of the above equation .

Impact Analysis for China- Macroeconomics Side

In this part, it uses the Solow model to analyse the FDI impact from a macroeconomic view, by using the data collected from the National Bureau of Statistics of China. The data range was chosen from 2017-2019, which is the period before the COVID-19 pandemic. It looks to see how FDI has changed in each sector relative to economic growth in the base case without FDI using the Solow model.

As economic growth can be affected by the total output of production, it is believed that increasing the FDI in different sectors, such as education, technology as to increase productivity. If the amount of labour is kept at the same level, the change in K and A will change the total production. Take the data from the National Bureau of Statistics of China, from 2017-2019's annual data (see appendix), at the end of 2016, 2017,2018, the overseas direct investment by sector shows, in the education sector is $723 million in 2016, $3.2 billion in 2017, $4.8 billion in 2018. For overseas direct investment in the technology sector, the data shows in the scientific and technical service sector, the amount is $19.7 billion in 2016, $21.6

billion in 2017, and $44.2billion in 2018. The amount of overseas direct investment in education and technology increases at the same time every year. If we consider the other sectors' net overseas direct investment, which is listed in the graph below, all the other sectors' investment can be considered as a change of local market environment to attract FDI. According to the data from the World Bank, the net FDI inflow in China is 174.75 billion in 2016,166.08 billion in 2017, and 235.37billion in 2018. Reflect to the theory, consider with the Solow model, the FDI in education and technology enhance the quality of human capital and productivity, FDI in other sectors lead to the change of market environment, which allowed the MNC to have more opportunity to access to good quality of human capital with lower cost, lower price of resource for production, good technology for production, as a result, it increases the total amount of FDI inflow. All these improvements in human capital and productivity increase the amount of total production. Due to the change in total production, at the macroeconomic level, this will lead to local economic growth. At the same time, when the FDI keeps up the growth, the GDP growth rate from 2015-2018 remains 6% which is a highly stable growth rate and good performance (see graph below) from international standards.

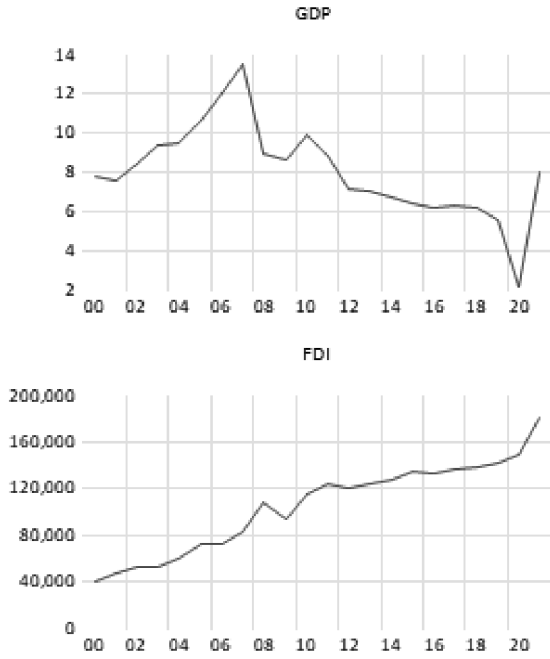

Figure 1: Growth rate of GDP and level of FDI in million US dollars

Looking back to earlier times, from 1978 to 2003, which can be seen as the first period that China changed its policy to attract FDI, in different provinces. Huang (2009) finds that "the effect of FDI on economic growth in different provinces is positive and statistically significant. More generally, our analysis indicates that the augmented Solow-Swan model appears to provide a good description of regional growth patterns in China over the period 1978-2003". Moreover, in the other researchers' work, Su and Liu (2016) examined the panel data at the city level, with the period 1991-2010. Their findings show that the growth rate (along the path to the steady-state income level) of per capita GDP is negatively correlated with population growth rate and positively correlated with investment rate in physical capital and human capital. We find that FDI has a positive effect on the per capita GDP growth rate, and this effect is intensified by the human capital endowment of the city."

As a result, it is no doubt that there is a positive relation between the FDI inflow, development of technology and human capital, which is positively correlated with the GDP per capita and economic growth in the city level and national level, which proves and supports the predictions of the Solow model.

Impact Analysis for China-Microeconomics Side

In recent years, as the macroeconomic environment changed in China, the policy of China encouraged FDI inward in China., A lot of MNC companies bring in technology helping Chinese companies develop in recent years. These MNCs have been taking advantage of the Chinese market. They use a lower cost of production to produce products and sell it globally or locally. Low cost of production makes their products more competitive in price. They also change the local consumer's behaviour of consumption. Because of the research and development (R&D) with globalisation, foreign high-tech companies start considering investing in China for R&D, looking for lower cost of resources and labour. These minimise their cost of technology development at the same time get access to one of the largest markets in the world, as the population growth in the last 30 years in China. It makes China a major supplies in markets, and it has most capacity to satisfy consumption. Since the policy has changed in the 1980s, to analyse the performance of such MNCs in China, in order to see FDI's effect on microeconomics aspect, cases of famous companies such as Philips, SAP, Microsoft, and Toyota are to be studied. These are

the most representative foreign companies that invest in China. These are obvious from trend of flows of inward and outward FDIS and their stocks are in Appendix 1.

For Philips, it has set up a research lab 20 years ago, because since China became more open at the time, as a global company, Philips believe China has huge potential for growth in the future (Philip News Center). As Philips was the first global company that operate in the Asia Pacific market, in China it has now become the largest foreign company in China within the last 20 years of development. It has 50 per cent of its employee in China among its total employees in the Asia Pacific area. In the local market, it has one million consumers in more than 180 cities. It benefits from the labour cost and other lower cost of product material. Philips has increased its productivity and those products made in China sell globally; overall, with 60% of its output going on export, 40% goes to the domestic market. The companies expected the future growth of sales, that China would become its top-line revenue contribution and its major production global centre. Also, it's believed that the economic growth of China, change local people's consumer behaviour as people may focus on product quality and brand instead of cheap price.

SAP is one of the biggest software companies in Germany. It started investing in China in 2003. It is based on their previous experience. This company has decided to move its R&D to China, which makes it the third-largest global lab located in China. SAP believes that, as China has now developed well in the IT sector. It has a huge demand capacity for software, and the market environment has changed compared with 30 years ago. Moreover, SAP now has more than 90% of customers coming from private and state-owned companies compared with 1990s when the first time company first came to China. Also, in recent years, SAP has developed its latest cloud product in Shanghai and a global product in Beijing. Moreover, due to the positive policy in China, in the future, SAP firmly believe that it is still the biggest market and valuable country to be invested in compared with other developing countries such as Russia and India.

Microsoft, it has opened its lab in China in 1998. At that moment, it was believed that China will become the most important market for software. So, since then, it has provided a Chinese version of Microsoft software, developed relationships with local companies and the Chinese government (Microsoft News, 1998, 2015). It now has Beijing as its home of R&D centre, and it has located its marketing organisation for eastern China in Shanghai. Moreover, Microsoft trained local people with skills

and technology on computer-based software, increasing their efficiency in the workplace. With over 200 training centres in China, the company also provides training to students in China. Microsoft has signed a contract with some large Chinese software companies to help them develop their business applications. In the last 20 years of development in China, Microsoft has become one of the top 10 innovative companies in China. It is one of the companies that is remaking the Chinese economy along with Alibaba, Baidu, Tencent and other companies.

For Toyota, it is one of the largest automobile companies in the world. It started expanding its business in China in 1994, taking advantage of the policy change in China, as the Chinese government encouraged local car company development and allowed the local firms to get needed technology from well-known companies like Toyota. So, the company started expanding its business in China by forming joint venture (Toyota Global (2012)). They set up manufacturing in Tianjin, Guangzhou, and provided technology to help the development of Chinese automobile companies. At the same time, Toyota can sell its cars at a lower price due to the lower cost of production in China. It increased its market share in China. With this, now China has become the second-largest market for Toyota. Recently, as new energy and electronic vehicle development have become a trending factor in the market, with policy support from China, Toyota decided to build a new factory in China with its local partner, FAW Group.

From all these cases above, in the microeconomic aspect, firms from different countries in different world areas come to China to look for opportunities for companies' development, especially when the economies keep growing as fast as in the last few years. It clearly shows that all these MNCs' purpose is to find profitability. They maximise profit by minimising the cost of production. They used their technological advantage to gain market share in one of the largest markets in the world. They help local firms' development at the same time, increasing local market competitiveness, enhancing technology development in China, and increasing the employment rate of the local area by creating a lot of job vacancies.

To give a conclusion on the above, from the beginning of the 21st century or even earlier, as the change of China's policy on inward FDI, it has attracted an increasingly higher amount of FDI in different sectors and in total. From the macroeconomic point of view, FDI provides a great chance for technological development. It now made China become technology innovation leader in some areas such as 5G,

E-payment and electronic vehicles. Also, it pushes up the value of human capital resources, which will further bring in more FDI in the future. This positive result is reflective of actual data, which proved that FDI drives macroeconomic growth. Evidence supports the slow model's expectation for long-term economic growth from FDI's impact. Similarly, the result of the discussion on the microeconomic aspect shows, the firms make a decision of FDI to get an advantage from host countries. It supports previous researchers' view, growth without an unstable business cycle and the enhancement of utility households occur according to these MNCs' activities of FDI. We attribute success to the policy in the last 30 years.

The microeconomics and macroeconomics model analysis results confirmed that the increasing number of MNCs and amount of FDI inflow in China create a good economic development opportunity. Developing countries benefit from the FDI both in the micro and macroeconomic sides. It is believed that such continuous flows of FDI will raise the growth rate continuously in the future.

FDI Outflow and impact on the domestic economy in China

The previous part of this research discussed the FDI's impact on economic growth from micro and macroeconomic sides by looking at the FDI inward. However, it is believed that FDI outflow will also have an impact on the domestic economy, especially since 2013, China has setup a new policy in order to encourage FDI outflow. EIU (2023) states in a report that the Belt and Road Initiative (BRI) launched in 2013 led to Chinese companies becoming formidable global investors. It is believed that a huge amount of FDI outflow will grow further in the next decade. Since the COVID-19 pandemic, its impact on the economy on China has made FDI outflow more important for China than in the past decade, as the Chinese government needs overseas expansion . More importantly, "It is aimed to navigate trade restrictions and to secure essential materials and technologies, and China to strengthen its relations with other countries (particularly those outside the West)." Looking back to the beginning of 21st century, China has another policy which support ODI, and it is known as the "going out" strategy which first discussed in 2000, since then, China joined the WTO in 2001, became one of the four new strategies of the 10th Five Year Plan (along with the Western development, the urbanisation and the skills strategies) and five years later, "going out" of private firms was specifically encouraged in official documents, OECD (2021) pointed out that, since then the

private firms increasingly ODI activities in about a decade. Which now until 2021, 70% of new Chinese ODI made by private firms.

Considering how the FDI outflow affects the domestic market, recent research confirms that the impact has a positive correlation with domestic economic growth. Li et al. (2016) found that such a positive impact appears on domestic employment. In which they use firm level data for investigation, "(including manufacturers, utilities and mining firms) over 2000- 13 and capture ODI by a dummy variable (i.e., whether the firm has invested overseas or not). Regardless of firm ownership, they found that overseas investment and domestic employment are positively associated. Song et al. (2017) also showed a positive effect of overseas direct investment on domestic employment using a province-level panel over 2004-14, with the effect decreasing as moving from East to West." In this research paper, the data range was chosen from 2017-2019 to examine the same level of data within the above model applied previously in the paper, to see if such an impact can still be positive on employment, together with other aspects of domestic economic growth.

FDI's Impact on Economic Growth in India

Apart from China, FDI seems to have a significant impact on the economic growth in India. As another big developing country of population in Asia, India's FDI performance and economic growth have drawn the attention to a lot of many economic scholars in recent years. Its significant improvement of economic and GDP growth makes it another good example of developing countries in progress to developed countries. The rest of this research will examine and review the FDI's impact on India's economic growth by reviewing its data from the same period (2017-2019) and comparing with the analysis results of China, and aim to find out what are the differences and commons between these two countries when FDI is applied to India and China's recent economic development. For comparison the trends of flows of inward and outward FDI and their stocks for INDIA are in Appendix 2.

FDI Policy in India

The policy of FDI plays a key role in India's recent economic development. Review the policy of FDI in India. it has been encouraged FDI inflow in India since 1991, the investment climate in this country has improved, and now India is part of the

top 100 clubs on Ease of Doing Business (EoDB). In 2014-15, FDI inflows in India stood at $45.15 bn and have consistently increased since then. Moreover, "Total FDI inflows in the country in the last 23 years (April 2000 - March 2023) are $ 919 bn, while the total FDI inflows received in the last 9 years (April 2014- March 2023) was $ 595.25 bn, which amounts to nearly 65% of total FDI inflow in the last 23 years. In FY 2014-15, FDI inflow in India stood at a mere $ 45.15 bn, which increased to $ 60.22 bn in 2016-17 and further to the highest-ever annual FDI inflow of $ 83.57 bn reported during the FY 2021-22. Total FDI inflows in the country in the FY 22-23 is $ 70.97 Bn and total FDI equity inflows stands at $ 46.03 Bn. Mauritius (26%), Singapore (23%), USA (9%), Netherlands (7%) and Japan (6%) emerge as the top 5 countries for FDI equity inflows into India, FY 2022-23. Top 5 sectors receiving highest FDI Equity Inflow during FY 2022-23 are Services Sector (Fin., Banking, Insurance, Non Fin/ Business, Outsourcing, R&D, Courier, Tech. Testing and Analysis, Other) (16%), Computer Software & Hardware (15%), Trading (6%), Telecommunications (6%) and Automobile Industry (5%). The top 5 States receiving the highest FDI Equity Inflow during FY 2022-23 are Maharashtra (29%), Karnataka (24%), Gujarat (17%), Delhi (13%), and Tamil Nadu (5%). According to the data from Invest India (2023). Usually, the FDI policy currently in India allows FDI inflow entry by the Automatic route and the government route.

Data Analysis of FDI in China based on the Solow model

The neoclassical Solow (1957) defined that the input of resources such as technology, capital, labour, or other variables of the additional economy, for example import or export, has a positive impact on the output which is economy growth (in this research as GDP level). Such relationship is determined by equation below:

$$Y = A\varphi(K, L, \Omega)$$

Where: Y = the total output, or GDP (or growth),

K = capital investment,

L = work (labour force),

A = efficiency of production (the constant of the model),

Ω = vector of additional variables.

It was developed by Findlay(1978) and Romer(1986), the "input" has been classify as foreign capital and domestic capital, the increase of internal capital is

due to the growth of foreign capital, in the internal growth model, as the change of technology in production process, "endogenous" are applied to showed the effect of FDI in host countries, base on Cobb-Douglas function, the Solow model shows the form as follow:

$$Y = A^{*}K^{\alpha *}L^{\beta *}\Omega^{\gamma}$$

Take the logarithm of the above formula, it becomes:

$$LnY_t = LnA + \alpha LnK_t + \beta LnL_t + \gamma Ln\Omega_t + \varepsilon_t$$

Where α, β, γ means the elasticity of: Y(GDP or economic growth), relative to capital(the main capital here is foreign capital FDI), L(Cost of labor, also average salary or number of employee), Ω (qualitative variables "dummy" indicator technology, foreign trade, no. of population, etc.) depending on the time "t". With εt stated term error model that incorporates all factors that are not included in the model.

Table 1: Economic variables and description.

Variable	Description of Variable	Source of Data
GDP	Gross Domestic Product (in USD)	CEIC database NBSC (2019)
AFI	Actual Foreign Investment (in USD)	EPS database
AWOE	Average wage of Employees (in USD)	EPS database

Descriptive Statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
GDP CNY 100 million	10311	1242.436	2722.543	.065	44652.8
year	10444	2006.417	9.231	1990	2022
Annual Average Exc~e	10444	7.178	1.015	4.783	8.619
Average Wage of Em~s	8439	31224.428	28272.568	9.81	320626.31
AFI	7578	62990.127	248527.48	0	7300994
lnAFI	7548	8.996	2.308	0	15.804
GDP USD (100 million)	10311	184.003	411.619	.008	6701.016
lngdp	10311	3.989	1.672	-4.853	8.81
AWOE usd	8439	4603.404	4344.019	1.185	49624.874
lnAWOE	8439	7.88	1.145	.17	10.812

Pairwise correlations

Variables	(1)	(2)	(3)
(1) lngdp	1.000		
(2) lnAFI	0.726*	1.000	
	(0.000)		
(3) lnAWOE	0.778*	0.480*	1.000
	(0.000)	(0.000)	

*** p<0.01, ** p<0.05, * p<0.1

Linear regression

lngdp	*Coef.*	*St.Err.*	*t-value*	*p-value*	*[95% Conf*	*Interval]*	*Sig*
lnAFI	.29	.004	76.00	0	.283	.298	***
lnAWOE	.751	.008	94.29	0	.735	.766	***
Constant	-4.168	.056	-73.79	0	-4.279	-4.057	***

Mean dependent var	4.448	SD dependent var	1.400
R-squared	0.797	Number of obs	7056
F-test	13805.482	Prob > F	0.000
Akaike crit. (AIC)	13540.452	Bayesian crit. (BIC)	13561.037

*** p<.01, ** p<.05, * p<.1

Regression results

lnAFI	*Coef.*	*St.Err.*	*t-value*	*p-value*	*[95% Conf*	*Interval]*	*Sig*
lnAWOE	3.917	1.533	2.55	.051	-.025	7.859	*
Constant	-22.007	12.185	-1.81	.131	-53.33	9.317	

Mean dependent var	9.121	SD dependent var	2.232
R-squared	0.566	Number of obs	7056
F-test	6.525	Prob > F	0.021
Akaike crit. (AIC)	-31166.630	Bayesian crit. (BIC)	-31152.906

*** p<.01, ** p<.05, * p<.1

Firstly, we test the significance between logGDP, logAWOE, logAFI based on the available data at the city level of China and run the linear regression analysis of

these variables. The correlation test with 0.726 and 0.778 indicated that the logGDP and logAFI have a strong correlation also the logGDP and logAWOE. In this model, the R-squared result of 0.797 means it explained 79.7% variance in lnGDP, which means the model has a good fit for explaining the variable. In addition, this result interpreted that a high level of Actual Foreign Direct Investment and a good average wage of employees associated with higher GDP, which in other words, the increase in FDI results in the increase of GDP, same as the Average wage of employees. However, the regression result between logFDI and logAWOE comes out of the result of r-squared of 0.566 which means there is only potential and borderline impact between these two variables; as a result, it is believed that FDI may not significantly impact the average wage of employees. There is are 0.29% increase in GDP with every 1% increase in AFI, and 0.751% increase in GDP with every 1% increase in the average wage of employees.

Secondly, we test the data at the province level. The result from the table below shows that, at the province level, lnGDP has moderate to strong correlation result of lnAFI, lnAWOE, which indicates an increase in lnAFI lead to an increase, also lnAWOE, in comparison, the increase in lnAWOE may have more significant effect lnGDP than lnAFI. While there was a 1% increase in AFI, leading to a 0.178% increase in GDP, compared to an increase in the average wage of employees as it rose 1% leading to a 0.912% increase in GDP. Moreover, 70% of the variance in GDP can be explained by this model, which means it is also suitable for analysing province data.

Descriptive Statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
AnnualAverageExcha~e	806	7.266	.822	6.143	8.29
AFI10000USD	806	626134.93	1532236.7	0	18362771
lnAFI	806	11.132	3.719	0	16.726
gdp100millionCNY	806	15816.124	19400.568	76.98	129118.6
AWOECNY	806	42994.402	34887.733	4889	212476
GDP usd	806	2344.77	2953.166	9.286	19285.11
lnGDP	806	6.964	1.428	2.228	9.867
AWOE usd	806	6354.52	5371.86	589.747	31538.667
lnAWOE	806	8.325	1.006	6.38	10.359

Pairwise correlations

Variables	(1)	(2)	(3)
(1) lnGDP	1.000		
(2) lnAFI	0.541*	1.000	
	(0.000)		
(3) lnAWOE	0.698*	0.120*	1.000
	(0.000)	(0.001)	

*** p<0.01, ** p<0.05, * p<0.1

Linear regression

lnGDP	*Coef.*	*St.Err.*	*t-value*	*p-value*	*[95% Conf*	*Interval]*	*Sig*
lnAFI	.178	.007	23.81	0	.163	.193	***
lnAWOE	.912	.028	33.01	0	.858	.966	***
Constant	-2.61	.237	-11.03	0	-3.075	-2.146	***

Mean dependent var	6.964	SD dependent var	1.428
R-squared	0.700	Number of obs	806
F-test	935.557	Prob > F	0.000
Akaike crit. (AIC)	1896.685	Bayesian crit. (BIC)	1910.761

*** p<.01, ** p<.05, * p<.1

So, in China's case, with the suitable model that was applied in this research, it confirms the strong correlation between average wage, FDI and GDP growth, which has been confirmed by the test result of both city-level and province-level data.

Base on the result from China's case, to make development policy for future, it is suggested government should increase foreign investment, find more possible way to increase salary of employee and also increase employment rate, to created continuing growth of GDP, more specific idea can be increase the productivity and human capital quality to attract FDI, for these point, we would discuss further in the rest of the chapter.

Contribution of this paper

This paper has made a contribution to existing research on FD, integrating both macro and microeconomics perspectives to provide a comprehensive analysis of the microeconomic and macroeconomic impact of FDI on economic growth (GDP growth). From the macroeconomic side, to cover the most available data within

the province and city levels of China to perform a reasonable result of data analysis based on a suitable model, present the impact of FDI on GDP growth in China from city-level's evidence and province-level's evidence. From the microeconomic side, it takes a case study of famous multinational companies to show evidence of FDI's impact on local economies. It looks back to the past policy that China's government made since the 1990s until now, examines the effects of significant policy shifts, such as China's entry into the WTO and recent national security laws.

Conclusions

In conclusion, this paper evaluated the most recent and wide range' available data in a more detailed level, to assess the impact of FDI in China. These are applicable to understand China's transition from a developing country to top middle-income country in the past 30 years. This also shows the practical aspects of FDI policy in China.

Recommendations

This paper suggested that further policies in attracting FDI to keep GDP growth in the future should be continued by the policymakers of the Chinese government, especially by providing good quality of human capital, and increasing the wages of employees. Further study can be conducted for the long-term effect of FDI from other aspects, such as environmentally sustainable and social development, capability of production. In addition, comparative analysis of other emerging countries or developing countries can be a further study's direction to provide insights of the global effectiveness of FDI policy from past to present.

Limitations

There are some limitations of this paper apart from its contribution. The data range limitation is because it is not possible to present the full impact of post post-COVID-19 pandemic, which may affect the findings at different times or future results. The policy can be rapidly changed due to China and the international environment, which cannot be covered in this research to account most recent policy changes' impact on FDI inflow and the outcome on economic growth. In addition, the model applied in this research may not fully explain the complexity of FDI impact; other models or additional variables may provide a more comprehensive understanding

of its relationship to the growth of GDP. Further study in the future to address these limitations may need to extend the data range to the most recent year, account for special events such as the COVID-19 pandemic's impact or other potential issues that could affect FDI by applying more advanced model. After addressing these issues, further research can provide more depth, finding that built on this paper, to provide a more reasonable and comprehensive understanding of FDI and GDP growth. Moreover, due to the lack of data access to India's regional level data, there are further comparison and analysis need to be done to compare China and India's performance of economic growth with the inward FDI.

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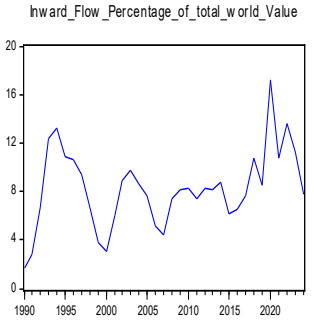
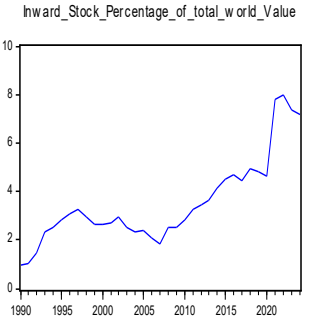
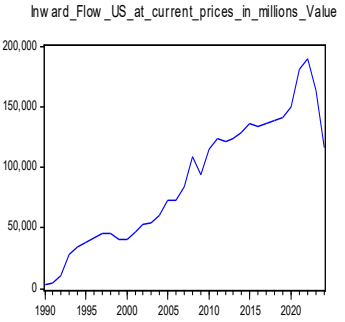
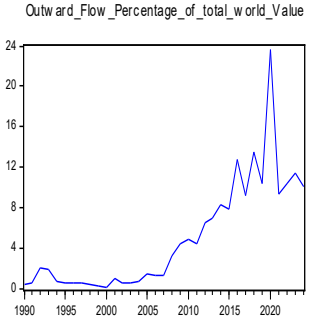
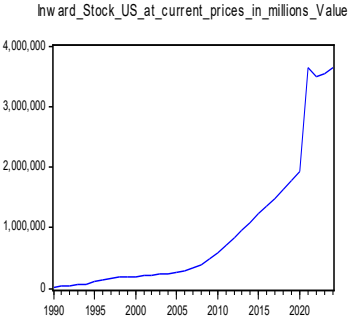
Appendix 1: Inward and Outward FDI of China

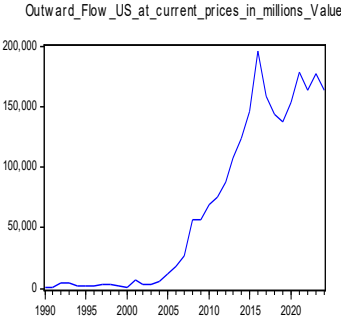


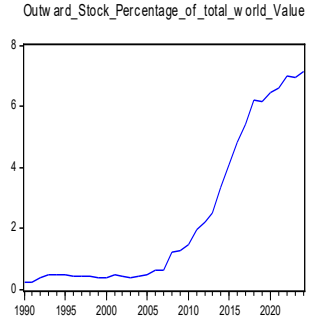


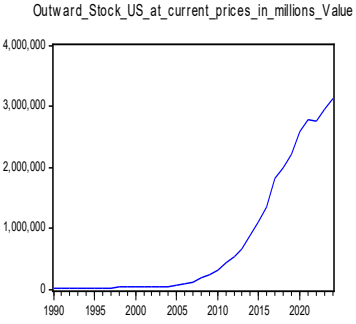






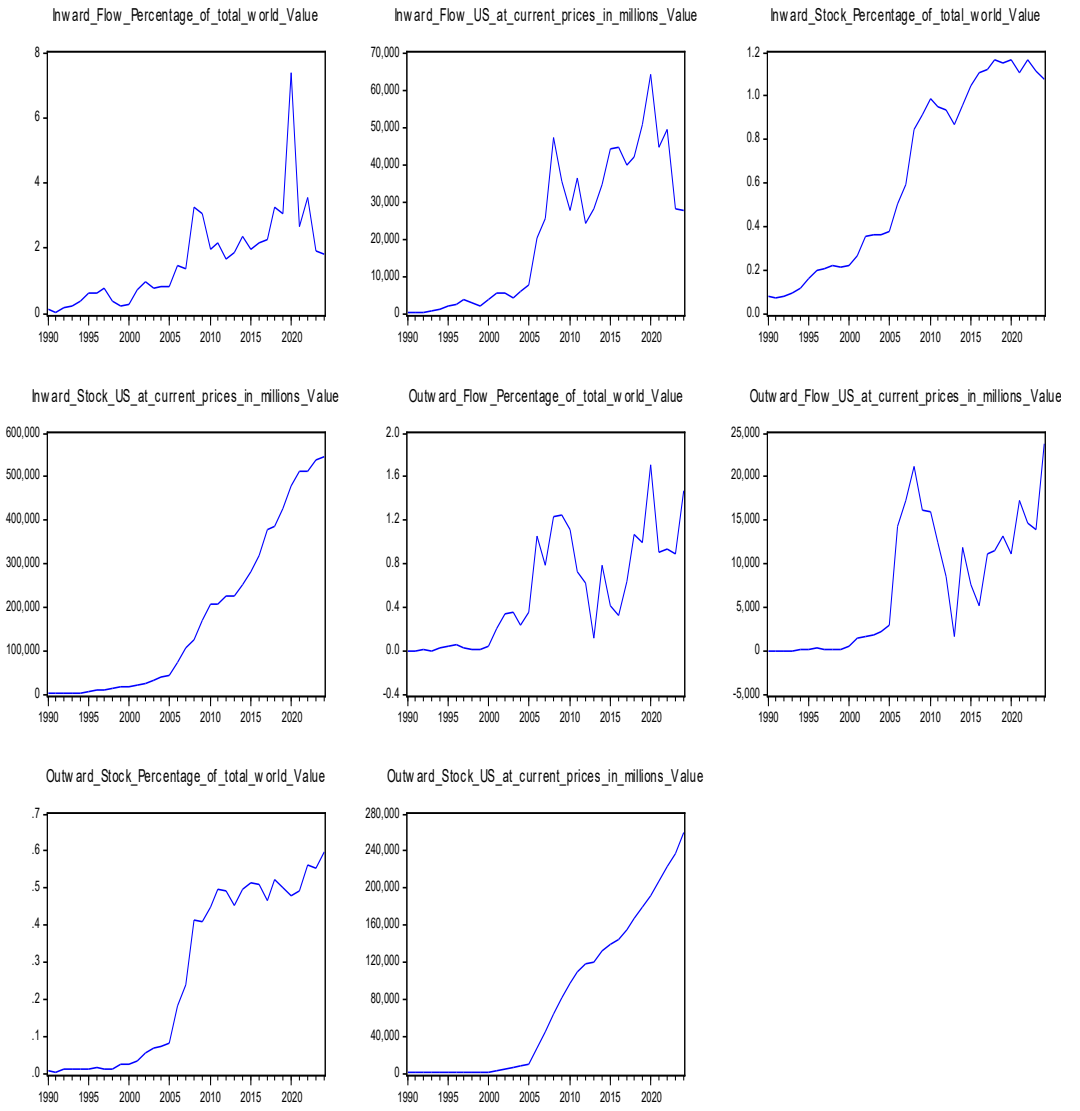






Data source: UNCTAD
FdiFlowsStock

Appendix 2: Inward and Outward FDI of India



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