LUND UNIVERSITY
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Impact of economic growth on income distribution in East Asian emerging economies

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Abstract: Income inequality is one of the main topics that worried economists in recent decades. It became more popular, especially starting with the integration process of East Asian economies' to the global market as a result of the globalization process. And there are lots of approaches on economic growth's positive and negative effects on income distribution. Its impact on income distribution has been tested in the essay with two models between 2000 and 2018. In the first model, 6 variables for 7 East Asian emerging economies have been selected, and in the second model, 4 variables for only China has been selected and tested. As a result of the regressions, some indicators of economic growth have a positive impact on income distribution and several of them has affected positively. And one of the main variables results also controversial. Although, inward FDI played an important role in an increase in income inequality in 7 Asian miracle economies, its effect on income distribution was positive in China and resulted in a decrease in the Gini coefficient which means a decrease in income inequality.

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1 Introduction

Rapid economic growth and the development of East Asian countries in recent decades are one of the main research topics among economists. The reason behind the "Asian miracle" has been explained by various factors by different scholars. Besides that, after the 1997-1998 Asian crisis, a new topic came into a debate among economists if that rapid development is miraculous as it was expected and sustainable or not. Undoubtedly East Asian economies performed a unique development pathway in the last 4 decades and poverty reduction was the most important outcome of that development. On the other hand, miraculous development did not only bring positive outcomes, it has several negative results such as a rising trend of income inequality, poor human rights, and insecure property rights. In that paper, we will examine the impact of FDI on income distribution for East Asian emerging economies and try to find out how far people can gain the benefit of economic growth.

Income inequality is one of the main important topics in recent years as an inseparable part of the global economy and it is evaluated as a new threat in front of the global economy. Moreover, it is also one of the main ingredients of the 'race to the top', and 'race to the bottom' theories. Proponents of 'race to the top' theories argue that globalization contributed to the economic growth and development of the countries and it resulted directly with an increase in people's prosperity. On the other hand, supporters of "race to the bottom" maintain that, although globalization contributed to the economic growth, it harmed people's welfare so that financial resources have been collected by a limited part of people and as a result rich people getting richer and poor people getting poorer. There is not any agreed approach on that subject and both sides have rather strong arguments that have been observed in various economies.

East Asia, especially China is also one of the main samples of rapid development growth that caught up as a result of globalization, and its effect on people's prosperity is always questioned by researchers. It is not accidental that economists always discuss the reasons, outcomes, and drawbacks of the Chinese economic growth and its interactions with global markets. Although as a result of globalization, FDI contributed to economic growth

and poverty reduction substantially, on the other hand, its effect on income distribution was not successful and not favorable for the poor people (Quibria, 2002). According to the World Bank China is one of the most unequal countries in the world on income distribution with 0.38% of the Gini coefficient. Although its relatively high rate that calculated based on official statistics, some economists argue that these numbers do not express reality and the rate should be more than the rate has been explained by the government. The high rate of income inequality doesn't only make researchers worry about it, it's also one of the government's crucial problems. A high rate of inequality can result in social unrest in the country which can make a challenge for the governments.

1.1 Research questions and hypothesis

As income distribution in recent decades is one of the main topics, I will try to determine the factors that affected it negatively or positively. The research question of that paper is: **How income distribution influenced by economic growth?** To be able to answer this question these sub-questions will be asked and answered to clarify the topic properly. The questions are:

1) Did economic growth affect the income distribution of East Asian emerging economies between 2000 and 2018?

To answer question 6 hypotheses will be tested. The dependent variable is the Gini index and explanatory variables are net FDI inflow percent of GDP, health expenditure per capita in US dollars, urban population, unemployment level, real GDP per capita constant, and export volume in US dollars:

Hypothesis:

Ho_1=Foreign Direct Investment has no significant impact on the Gini index in East Asia

Ho_2 = Total Health expenditure has no significant impact on the Gini index in East Asia

Ho_3 = Urban Population has no significant impact on the Gini index in East Asia

Ho_4 = Unemployment has no significant impact on the Gini index in East Asia

Ho_5 = GDP per capita has no significant impact on the Gini index in East Asia

Ho_6 = Export volume has no significant impact on the Gini index in East Asia

2) Did economic growth affect the income distribution of China between 2000 and 2018?

To answer question 4 hypotheses will be tested. The dependent variable is the Gini index and explanatory variables are net FDI inflow percent of GDP, the population of large cities, high technology exports measured in US dollars, and GDP per capita PPP which considers purchasing power of people:

Hypothesis 2:

Ho_7= Foreign Direct Investment has no significant impact on the Gini index in China

Ho_8 = Population in a large city has no significant impact on the Gini index in China

Ho_9 = High technology export has no significant impact on the Gini index in China

Ho_{10} = GDP per capita has no significant impact on the Gini index in China

2 Background

2.1 East Asian Miracle and Asian Financial crisis

After World War II the global economy has been entered into a new era which was distinguished with poverty, hunger, migration, economic and political instability, social instability, etc. (Kesternich, Siflinger, Smith, & Winter, 2012). China and Japan were two countries affected by war the most in Asia with both its effect on economic development and the number of military and civil deaths (Kesternich et al., 2012). The financial system of the countries has been destroyed and it could not manage to recover it for several years. During the Cold War, although the financial system of Europe and Japan (emerging periphery) has struggled in a collapse, the US could protect its leading role as a financial center of the world with its essentially uncontrolled capital and goods (Dooley, Folkerts-Landau, & Garber, 2003). Japan and Europe draw a pathway that consisted of controls on trade and capital flows, undervalued currencies, and reserve accumulation supported by the US through FDI to rebuild their financial system (Dooley, Folkerts-Landau, & Garber, 2003). The US has supported the economic interdependence of these countries with FDI within the Bretton Woods international monetary system (Dooley, Folkerts-Landau, & Garber, 2003). With the support of the US, the capital of the periphery countries has been reestablished and their institutions have been reconstructed and these reforms resulted in the graduation from periphery countries to the center again (Dooley, Folkerts-Landau, & Garber, 2003).

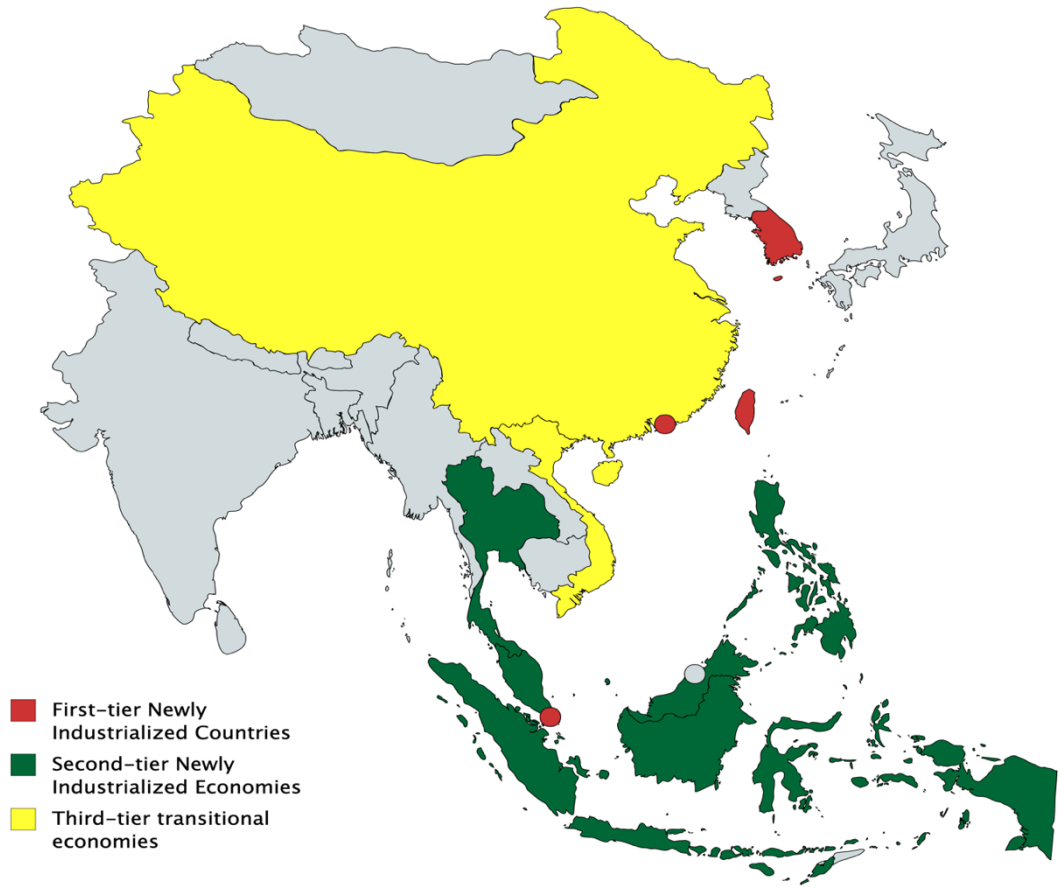
Japan's restored development strategy also affected other East Asian economies, especially first-generation newly industrialized economies, and was the beginning of a long and successful pathway to the "East Asian miracle" (World Bank, 1993). The East Asian miracle has been started since the 1950s with substantial reforms in four economies: South Korea, Taiwan, Singapore, and Hong Kong which is called First-tier Newly Industrialized Countries (NICs), and it was distinguished with a rapid change from labor-intensive manufacturing to capital-intensive industrialization during the time. What reforms have been followed by 4 ASEAN countries - Second-tier Newly Industrialized Economies (NIEs): Malaysia, Thailand, Indonesia, and the Philippines in the 1960s. China and Vietnam were the

last circle of the chain and called the Third-tier transitional economies (Figure 1). A rapid shift towards capital-intensive industrialization of these economies has been explained by researchers with two approaches: state-led growth model and market-friendly reforms. Because of the heterogeneity among these countries and the characteristics of the structural transformation of each country, it is impossible to explain the rapid development by a single technique. Though industrial policies and political situations were unique in each of these countries, some features had common features such as attendance of education, openness to the global market, building a sustainable financial system by access to directing credits, and implementing innovation and technology in industrialization (World Bank, 1993).

Structural transformation and rapid economic development are the main characteristics of the region since the 1960s, and the GDP growth rate reached to 8 percent annually (Quibria, 2002). Sustainable economic growth has been observed from 1960 to 1990 in the region and education played an important role by substantial investment in human capital and it contributed to capital accumulation that is necessary for domestic investment (World Bank, 1993). In addition, successful macroeconomic management - that supported investment flow, built a sustainable financial system was also among the factors behind the "miracle" (World Bank, 1993).

In the early 1990s East and Southeast Asia performed a substantial development and besides the quarter of the world output has been accounted for the region, half of the world output and two-thirds of the capital spending was associated with the region (Wade, 1998). There has been observed a fiscal balance in addition to a low inflation rate and high saving rates (Wade, 1998). Education was put to the center of policies and the products that have been produced by the regions found a way to the most demanding markets of the world (Wade, 1998). South Korea not only performed an incredible success on unemployment and inflation rates but also was jumped to the 11^{th} biggest economy in the world with 8% growth a year. Indonesia was another example on the track of caching up with a low inflation rate and low account deficit with 4% of GDP. Thailand was also one of the fastest-growing economies with 8.6% growth and its saving rate was among the highest point in the world by 36% of GDP (Wade, 1998).

Figure 1. Map of the emerging Asia-Pacific region and Miracle economies



Source: mapchart.net

Although fundamental development such as high saving rates, budget surpluses, export-oriented industries, and low inflation rate, foreign creditors started to withdraw their investment from the region as a result of their concerns of currency overvaluation, weak real estate markets, and bank scandals in the spring of 1997 (Sachs, 1998). The devaluation of the Thai baht in July 1997 had fueled that concern and resulted in currency crises and financial instability in the region (Wade, 1998). These concerns did not let the investors to evaluate Asia's long-term prospects truly and that event resulted in the 1997-1998 Asian Financial crisis which pulled the region to the economic recession and raised questions on the "Asian miracle" myth.

The reasons for that turning point are explained by different economists with several factors. Wade (1998) explained it with the result of excessive government intervention in markets, especially financial markets, and the IMF's inappropriate approach. According to Sachs (1998), IMF's declaration was the main cause of the crisis, so that IMF came to Thailand with the declarations that argued instead of high economic management, the economy was under risk and an immediate surgery needed for it. Additionally, the IMF explained preventive measurements such as budget cuts, high-interest rates, and immediate bank closures which rocketed the panic in the markets (Sachs, 1998). The same scenario has been repeated in Indonesia and South Korea in November and December respectively and it has concluded with spreading of the panic to all East Asia (Sachs, 1998).

Although these devastating economic and social consequences, the region restored economic growth and a new era of development have been started. And, FDI inward to the East Asian emerging economies was one of the most crucial parts of the new period.

2.2 Economic reforms, FDI, and inequality in East Asia,

East Asian economies have expressed rapid economic growth in the last 4 decades which is also called "Asian miracle" in several pieces of literature and its development strategy started to learn as a best practice. On the other hand, the Asian financial crisis that happened in 1997-1998 made people question if that development is sustainable or not. Between 1960 and 1985 a dramatic increase has been observed in real income per capita of these countries and it increased 4 times in Japan and the first-tier countries 2 times in the second tier economies (World Bank, 1993). Life expectancy has also been escalated from 56 years to 71 years during the period in the region. The rocketed development for the second tier NIEs and third-tier transitional economies started from in the early 1980s (World Bank, 1993).

Similar to all other transitional economies Asian miracles also started with producing with technologically simple and labor-intensive products (toys, garments, processed foods) and transferred the labor in time to capital intensive and technologically advanced products which are called "wild-geese-flying pattern" (Akamatsu, 1962; Haraguchi and Gorazd, 2010; Weiss, 2005). As it is expected from the pattern, the economic growth of East Asian

economies ended up with an increase in the share of industrial value-added and share of agriculture's share on GDP has been decreased below 15 % in the region (Haraguchi and Gorazd, 2010).

According to Quibria (2002), there are 5 main common features of East Asian growth countries. First of all, these countries succeeded in poverty reduction by sustained growth. Second, a strong relationship between economic growth and income inequality is one of the main characteristics. Although the level of inequality is different in each country, the general trend was a rise in income inequality during the catching-up process. Third, initial conditions, especially high educational attainment, dynamic agricultural sector, and low initial inequality played an important role in the early years of development. Fourth, rapid capital accumulation which has been accelerated as a result of institutions and market-oriented policies. It contributed to integration to the external world and established a domestic economic environment that pushed production. Fifth, successful economic framework that supported open-market institutions and provided economic freedoms (Quibria, 2002).

World Bank (1993) also listed the main bullet points that directly related to the miraculous economies as a lesson for other developing countries: "While there is no recipe for success, there are some positive lessons: keep the macroeconomy stable; focus on early education; do not neglect agriculture; use banks to build a sound financial system; be open to foreign ideas and technology, and let relative prices reflect economic scarcities".

According to Leipziger and Thomas (1993), 3 main attributes contributed to the miracle are outward orientation, macroeconomic stability, and investment in people. He mentioned the role of pragmatic policymaking on drawing the effective pathway of miraculous economies. Although some of these countries were lack of natural resources, especially first-tier countries that hadn't got natural resources and dependent on developed countries based on some factors (For example, the US food aid was crucial for South Korea and Taiwan), these economies overtook that dependence with sharing these common features:

The adaptable and disciplined labor force was the only characteristic that belonged to all of these economies (Leipziger and Thomas, 1993. From the 1960s huge investment has put in secondary education by governments and it showed its positive outcomes when it has combined with returned skillful expatriates and imported technologies. For example, Singapore started to invest in education and technical skills besides infrastructure at the beginning of 1960 to attract FDI. Additionally, the government promoted higher-technology with implementing high-wage policy for skilled workers to move out of traditional labor-intensive towards manufacturing in the early 1970s (Leipziger and Thomas, 1993).

The national vulnerability was another factor among these economies which helped them to keep physical and financial independence, primarily of first-tier countries. For example, South Korea, Singapore, and Taiwan used the society's work discipline to change their poor initial conditions (South Korea was a divided country; Taiwan was trying to get its economic independence; Singapore was stacked among competitive environment) to their advantages (Leipziger and Thomas, 1993).

The relative *equality of income* was one of the mutual initial conditions of these countries with land reforms and public housing investments which achieved as a result of policy instead of inheritance. For example, income inequality has been decreased in South Korea and Taiwan in the early years of development by land reforms (Leipziger and Thomas, 1993).

Export development has increased as a result of the realization of the fact that export could be the main source of revenue for them. For example, Malaysia implemented an import substitution policy with its Fourth Five Year Plan (1981-1985) influenced by Japan and South Korea. The Heavy Industries Corporation of Malaysia (HICOM) has been established to arrange the production of machinery and equipment, automobiles, petrochemicals, building materials, pulp, and paper (Leipziger and Thomas, 1993. The project could not gain success and it forced the government to change its policy and started a new program on privatization (Leipziger and Thomas, 1993).

Domestic entrepreneurship as an inseparable part of export development also developed and publicly-owned corporations have been built. These were called *chaebol* in South Korea that has been established inspired by the Japanese conglomerate model – *zaibatsu.* Another country that copied South Korea's experience was Indonesia that blueprint it's Heavy and Chemical Industry (HCI) in the 1970s (Leipziger and Thomas, 1993. Its Investment Policy List, which was copied from South Korea as well, was distinguished with the discouragement of FDI, setting a limitation on capacity, and direct control on industrial entry. That "reforms" hurt the local industry which was mainly state-owned enterprises by trade barriers and governments subsidized credits could not protect steel, petrochemicals, and plastics sector that also affected by the post-oil-boom years (Leipziger and Thomas, 1993. That failure motivated the government on trade liberalization and encouragement of foreign investment which encouraged domestic entrepreneurship and is one of the East Asian dynamos (Leipziger and Thomas, 1993).

Additionally to common features like efficient bureaucracies, export drive, political stability, investment in human resources, and macroeconomic stability, Leipziger and Thomas

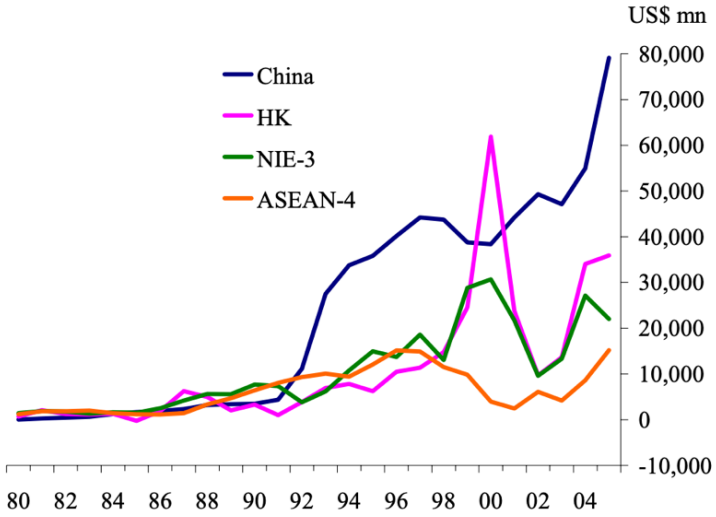
(1993) also compared the development pathway of first-tier countries with second-tier economies. They mentioned the state's critical role in industrialization and argued that visionary leadership and strong economic institutions were among the main characteristics of the first-tier economies. On the other hand, initial conditions and political institutions were different from formers and they were more dependent on FDI than foreign aid because of their natural resources. Although, second-tier NIEs didn't follow the same policies to acquire advanced technology but instead of its selective industrial policies implemented and failed (Leipziger and Thomas, 1993).

Globalization, technological change, and market-oriented reform are among important contributors to the economic growth of East Asia (Zhuang, Kanbur & Rhee, 2014). Besides its effect on economic growth, these factors are the cause of income inequality between capital and labor owners, urban and coastal regions, or skilled and unskilled workers. And when poor institutions added to these factors, it results in unequal access to opportunities (Zhuang, Kanbur & Rhee, 2014).

In the last four decades, GDP has increased by 7% in 2005 PPP terms in developing Asia which is one of the best in the global economy (Zhuang, Kanbur & Rhee, 2014). China is the main contributor to that success with its 9.9% annual GDP (Zhuang, Kanbur & Rhee, 2014). FDI has traditionally played an important role to gain high economic growth and development. FDI flow to East Asia has increased dramatically till 1990 from US$21 billion to US$156 billion in 2005 although the Asian Financial crisis in 1997-1998. On the other hand, China is the main country that received a valuable part of FDI thanks to its cheap and skilled labor or large market, and its rapid economic growth. The amount of FDI increased from US$3.5 billion in 1990 to US$79.1 billion only in China in 2005 (Liu, Chow & Li, 2006). Additionally, East Asian economies, especially China, Hong Kong, and Singapore attracted more than 80 percent of the FDI to the region and these are the main FDI recipient countries in recent years (Liu, Chow & Li, 2006).

Graph 1 shows the inflow of FDI toward East Asia between 1980 and 2005. According to the chart, FDI flow has started to increase from US$3.5 billion in 1990 and reached its peak with US$ 79 billion in 2005. China's share in that flow increased from 17% in 1990 to its peak with 66% in 2002 and decreased to 52% in 2005. The decline in the share of the FDI in the Chinese economy has replaced by the increase in FDI flows to the Newly Industrialized Economies (NIE) including Hong Kong, Korea, Singapore, Taiwan, and the ASEAN economies.

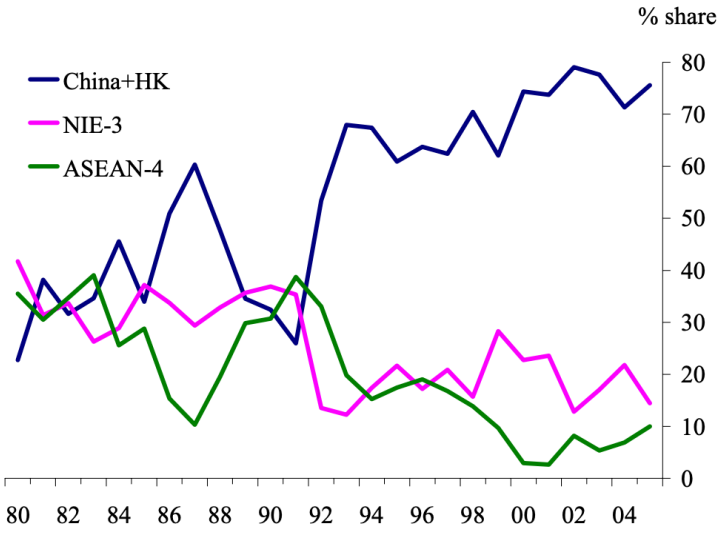
Figure 2. Inward FDI flows to East Asia (1980-2006)



Source: (Liu, Chow & Li, 2006)

Additionally, Hong Kong's share of total inward FDI has been increased twice from 13% in 2002 to 24% in 2005. Although the quick success in the region, the rate for the four large ASEAN economies - Indonesia, Malaysia, the Philippines, and Thailand have been decreased and reached their level which succeeded before the Asian financial crisis before it restored. These economies' total share has been decreased dramatically from 40% in 1990 to 3% in 2000 and increased again to 10% in 2005 (Graph 2) (Liu, Chow & Li, 2006).

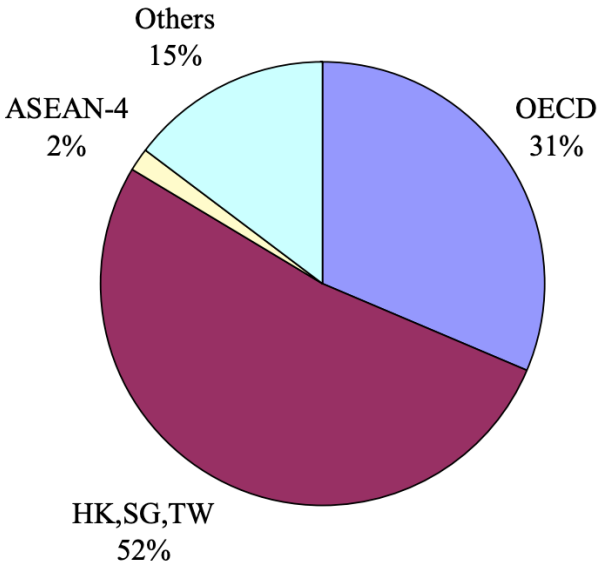
Figure 3. Share of inward FDI flows to East Asia (1980-2006)



Source: (Liu, Chow & Li, 2006)

Sources of FDI for these economies also distinguished from each other. The main portion of FDI inflows to China has been originated from Hong Kong, Taiwan, and some offshore financial centers, such as the British Virgin Islands and the Cayman Islands. In the period between 2000 and 2003, only 30% of FDI inflows to China originated from OECD countries, especially from Japan, the US, and Germany (Graph 3) (Liu, Chow & Li, 2006). On the other hand, it is expected that approximately half of the FDI flows from Hong Kong and offshore financial centers to Mainland China was belonged to China and it's roundtripping. Investors prefer roundtripping to secure property rights and benefit of advantageous fiscal incentives as foreign-funded households or escape regulations that prevent global trade (Liu, Chow & Li, 2006).

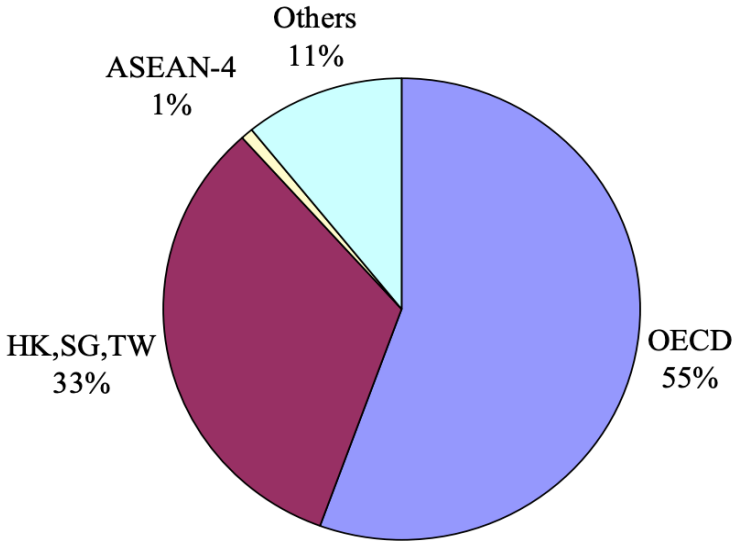
Figure 4. Source of inward FDI flows to China (2000-2003)



Source: (Liu, Chow & Li, 2006)

On the contrary, OECD countries play an important role as a source of FDI to the ASEAN-4 besides Hong Kong, Singapore, and Taiwan (Graph 4) (Liu, Chow & Li, 2006).

Figure 5. Source of inward FDI flows to ASEAN-4 economies (2000-2003)



Source: (Liu, Chow & Li, 2006)

2.3 Economic reforms, FDI, and inequality in China

After the reforms began in China in 1978 with investment in the agricultural sector and privatization, China has been the most attractive environment for developed countries to move their manufacturing with low-wages-labor force (Garnaut et al., 2018). There is a dramatic increase in GDP from the beginning of the 1980s and the country has achieved fast development with rural reforms, decentralization, and privatization. Globalization has a positive result that touches directly on the population. Economic development has been acquired and GDP per capita has increased 9.8 percent annually after China opened its borders to FDI and foreign trade (Zhang and Zou, 2012). 850 million people moved out of poverty line only in China in the last three decades (Weiping, 2018).

Rising inequality in China is directly linked with its transition from a planned economy to the open-market economy which began with 1978 reforms. Before the reforms accelerated income inequality an egalitarian society has existed till 1978. Low levels of income inequality among societies and industries were characteristic for China before reforms. And the rate was almost the same with Nordic countries in that period (Piketty, Yang & Zucman, 2017). Earnings of bottom 50% were 27% of total income, and the total income rate was the same with top 10% of the population (the rate has changed over time and it was 15% for the bottom 50% of the population and 40% for top 10% of the population in 2015) in

the country (Piketty, Yang & Zucman, 2017). Although egalitarianism was the main characteristic of the country, two historical events played an important role in rising income inequality in that time: Cultural Revolution and Great Leap Forward famine (Naughton, 2007, p. 39, 72).

Early times of reforms are characterized by income convergence as a result of rural-development strategy, farming decollectivization, and development in agricultural productivity with a Household responsibility system. It is followed by the introduction of Township and village enterprises (TVEs) which supported diversification and reduce rural-urban inequality with the help of the establishment of rural employment opportunities (Knight, 2013). Its positive outcome has been observed soon in the rural-urban income gap and it has been decreased under 2 times difference (the ratio is 3.5 times now) (Piketty, Yang & Zucman, 2017). In addition to rural-urban convergence until 1985, millions of people also moved out of the poverty line (Perkins, Radelet, Lindauer & Block, 2013, p.189).

From 1985 income gap has started to rise again and the transition period from one of the world's egalitarian society to one of the world's most unequal society, especially among households, rural-urban areas, and across regions has started. Deng Xiaoping's speech in his popular "Southern tour" in 1992 has played a lion share role to speed up the process. It was the message of policy shifts to establish a more productive investment environment in the country to attract more FDI (Naughton, 2007, p. 403) And it concluded with a great inflow of FDI to the country so that it has increased dramatically and reached its highest point of the net inflows rate of it in GDP in 1993 (World Bank, 2020).

New kind of ownership has been established as a result of economic reforms and it affects negatively especially two types of members of the society: uneducated people and women. The wages between higher or lower-level educated people were not distinguished dramatically before reforms and having a diploma didn't give anyone an advantage on income. Because of a substantial part of jobs required low labor activities that did not need any special skills or knowledge. However new technologies brought by foreign companies after the country opened its borders to the world economy demanded higher-educated and skilled people which was resulted in the hiring of higher-educated people with higher wages (Gan, 2013).

One of the most important parts of China's economic reforms was opening its borders to foreign investments after 1978 when the country implemented an "open door" policy (Chantasasawat, Fung, Iizaka & Siu, 2004). Although the reforms has been started in 1978 the amount of FDI to the country has started to increase from the early 1990s with Deng

Xiaoping's promises on opening the market and market-friendly reforms during his visit to the southern provinces in 1992. And then FDI inflow to the country fluctuated till the 2000s for several reasons like the 1997-1998 Asian financial crisis and backed up again with its next big wave in 2000 (Eichengreen and Tong, 2005). In 2002 though the declining trend of FDI all over the world, China expressed a successful performance with overtook the US and became the second-largest destination of FDI all over the world (Chantasasawat et al., 2004).

During the early years of reforms was distinguished with attracting FDI mainly from Hong Kong, Taiwan, and Macao during the 1980s and early 1990s. One of the main aims of reforms was attracting FDI from other countries as well and by that purpose, Special Economic Zones (SEZs) has been established in the south-east part of the country. At the beginning four SEZs has been established in Guangdong (Shenzhen, Zhuhai, and Shantou) and Fujian (Xiamen) (Chantasasawat et al., 2004). Besides that one more SEZ established in 1985 in Hainan and these 5 SEZs played an important role in a rise in average income. Their independence because of out of the political power of Beijing made them successful in attracting FDI and catching development in a short time (Crane, Albrecht, Duffin & Albrecht, 2018).

2.4 Role of Institutions in the development process of emerging economies

Institutions play a critical role in designing the political and economic situation of the economies and these are one of the main motives in success or failure. The economic success of the countries mainly depends on the strength of institutions a country has established. Following Quibria (2002) strong institutions established until the 1960s in East Asia and these institutions is the main driver of the development of the region. Investment in human capital and providing strength macroeconomic environment with a successful legal framework that accelerates the catching-up process of East Asian countries are among the positive outcome of these institutions (World Bank, 1993). These countries reached their goals with economic liberalization and privatization, investing in human capital, and securing property rights (Quibria, 2002; Sundaram and Wee Chong, 2013). Additionally, an export-oriented policy that was replaced by import substitution with the advantages of low-labor and access to foreign finance pushed the progress (Alesina and Rodrik, 1994; Wade, 2004). These reforms

played a more important role to attract FDI and technology to the region and made it possible to produce capital intensive goods that contributed to economic development (Baek, 2005; Rodrik, 2006; Weiss, 2005).

On the other hand, Dollar (2013) stated poor institutions that increased income inequality and slowed the economic development in China: Household registration system-hukou; repressed financial system; a rewarding system which prevents labor movement and investment flow among provinces; large roles of state enterprises in the economy and an increasing trend of saving instead of investment in the country. Acemoglu (2012) and Fukuyama (2012) also added limited access to the global markets, insecure property rights, and oligarchy's power in China to the list of poor institutions.

The *hukou* system is a registration system that lets the government track all the citizens and somehow prevent rural-urban migration. Usually, people are registered in the place of birth, and changing the registered location is almost impossible. Although a child has been born in the city, it has registered in its mother's registration location. Its future opportunities for using public services also depend on that location, as urban citizens have access to better education and healthcare and other public services (Dollar, 2013). Additionally, when the rural family moves to cities, they will lose their rights over the lands, and that's why families have to leave their children behind them, or only one partner is visiting for a job. One of the hukou registrations system's purpose is to protect low-skilled labors of urban from rural workers (Appleton, Song & Xia, 2014). Although the main purpose of the system is to prevent rural-urban migration, 52% of the population lives in urban areas instead of 38% formal urban citizens in China (Dollar, 2013). Usually, migrant men work in the construction sector and migrant women find a job in restaurants, hotels and labor-intensive factories (garments, shoes, electronics, etc.) which is called dirty jobs and urban residents don't prefer to accept these jobs (Dollar, 2013). And rural workers are paid less comparing with urban workers even if they have the same skills and level of education because of their less freedom and weak bargaining power (Dollar, 2013; Lu & Song, 2006; Meng & Zhang, 2001). On the other hand, urban workers specifically work in the state sector does not only secure their jobs, but they also earn more and gain several social benefits like free medical services, cheap housing, lifetime employment, some government subsidies, and pension (Meng & Zhang, 2001). As the hukou system does not let urbanization China performed one of the least urbanization rates in the region even if migrant also counts. The same rate in South Korea was 68% in 1987, in Taiwan the rate was 66% in 1980 and 74 % in 1989, and in Japan it was 76% in 1980. The hukou system also resulted in the highest income

gap among urban-rural regions with 3:1 by prohibiting rural residents to find a high-paid job in big cities (Dollar, 2013).

The large state sector is the second crucial institutional feature that characteristic to the Chinese economy. Though at the beginning of the reforms all enterprises belonged to the state, especially small and non-strategic firms have been privatized for attracting domestic and foreign investment during the years and their share in the fixed asset investment decreased to 41% during 2004 and 2012 according to the National Bureau of Statistics (Dollar, 2013). Heavy industrial sectors like minerals and oils were the main sectors that owned and run by state ownership and besides that finance, telecom, media, logistics, airlines, and that type of modern sector are at the center of the government's policy as an important part of state ownership (Dollar, 2013). One of the main drawbacks of these types of enterprises is that they do not transfer their earnings to the state budget to fund public services, but they use it as a form of reinvestment and it concludes with lower income for households as they are not able to get benefit from that resource (Dollar, 2013).

The *repressed financial system* is another type of institution that affects the development of China in one way or another (Dollar, 2103). Controlling interest rates always stays as a barrier in front of the development. After the reforms, the government achieved on the liberalization of lending interest rates, but deposit interest rates are still controlled by the central bank. Interest rates have been determined just above the inflation rate and in that situation its return for depositors equals almost zero (Dollar, 2013). Intentional regulation on bond and stock market and control on an outward capital are limiting the investment opportunities of households to use their savings (Dollar, 2013). China is not the only country that implemented these measurements which have been used in Japan, South Korea, and Taiwan in their early years of development (Dollar, 2013). The only winner of that financial system is the state-owned enterprises, by accessing low-interest rate loans from banks that arranged from low-interest deposit rates (Dollar, 2013).

The fourth characteristic of the country's institutions is *the reward structure for local government officials*. That system started with Deng Xiaoping's leadership which gave more power and flexibility to local governments on five-year plans to contribute more to the development and government's macroeconomic planning (Dollar, 2013). The principle was to promote the officials based on their investment and growth results. And they did not have permission to attract loans from banks directly, that's why they have established thousands of Local Government Investment Vehicles (LGIV) that responsible for infrastructure development (Dollar, 2013). LGIV accessed finance easily by getting loans with low-interest

rates from state banks and invested heavily in building roads, rail, metro, power generation, and distribution projects (Dollar, 2013). Migrant workers have been attracted as low-cost labor and lands have been taken from peasants by paying below-market compensation for the land to build the industrial parks (Dollar, 2103). Local governments performed better with these local policies to attract investment and provide economic growth (Dollar, 2013). On the other hand, environmental protection and social services have been pushed to the second plan and at the same time, a fertile atmosphere has been established for local officials and their families being rich by the corruption of using investment for their private purposes instead of infrastructure projects (Dollar, 2013).

3 Theory

The chapter covers the theories that show how economic growth affects income distribution in economies. The Kuznets curve and the Gini coefficient will be explained as the main tools for measuring income inequality and its transition path as a result of economic growth.

3.1 Economic growth and income distribution

Economic growth depends on mainly factor accumulation and productivity growth. The main ingredients of factor accumulation are: a rise in the labor force and growing of the size of capital stock that demanded for more production (Perkins et al., 2013, p.63). Productivity growth expresses the widening capacity of output produced by machines that using advanced technology or by every worker with a contribution of improving efficiency (Perkins et al., 2013, p.63, 64).

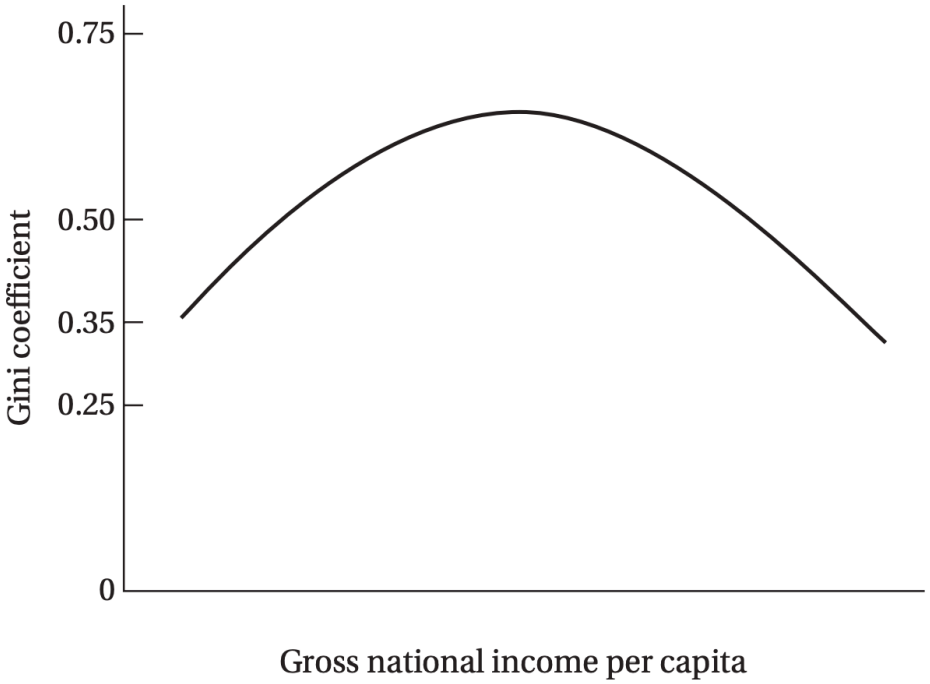
Neoclassical growth theory argues that poor economies are developing faster than rich economies and income convergence has happened when sustainable economic development succeeds (Cole and Neumayer, 2003). According to the theory, the development of poorer economies is faster than richer economies because of decreasing returns if the same preferences and technologies implement to both (Zhang and Zou, 2012).

3.1.1 The Kuznets Curve

The Kuznets Curve is a tool to measure economic growth's effect on income inequality established by Simon Kuznets in 1955. According to Kuznets (1955), the transition period from agriculture to the nonagricultural sector is the sign of economic growth of any economy and income distribution is the main factor that has been influenced by that transition process. In the early stages of the industrialization process, income inequality rises and on time it declines again and is formed as a U shaped curve (Kuznets, 1955; Perkins et al., 2013,

p.174). Although the theory cannot be implemented to all economies, it is one of the widespread theories used on measuring income distribution. Top 20% and bottom 40% of the population are the main ingredients of that method to calculate income inequality (Todaro & Smith, 2015, p.219).

Figure 6. The "Inverted-U" Kuznets Curve



Source: Todaro & Smith (2015, p.236)

Kuznets argued that when everyone worked in the agriculture sector, wages have been distributed equally, but the development of urbanization and industrialization brought unequal wages with it (Perkins et al., 2013, p.174).

3.1.2 Lewis's surplus labor model

W. Arthur Lewis is a Nobel Prize winner economist who invented a theory on income inequality's effect on economic growth. He claimed that rising inequality is not an infinite movement and it reaches its turning point when the manufacturing sector has been fully supplied by labor and then it tends to decrease (Perkins et al., 2013, p.174). During the early years of transition period unlimited labor is supplied by the agricultural sector, it means an

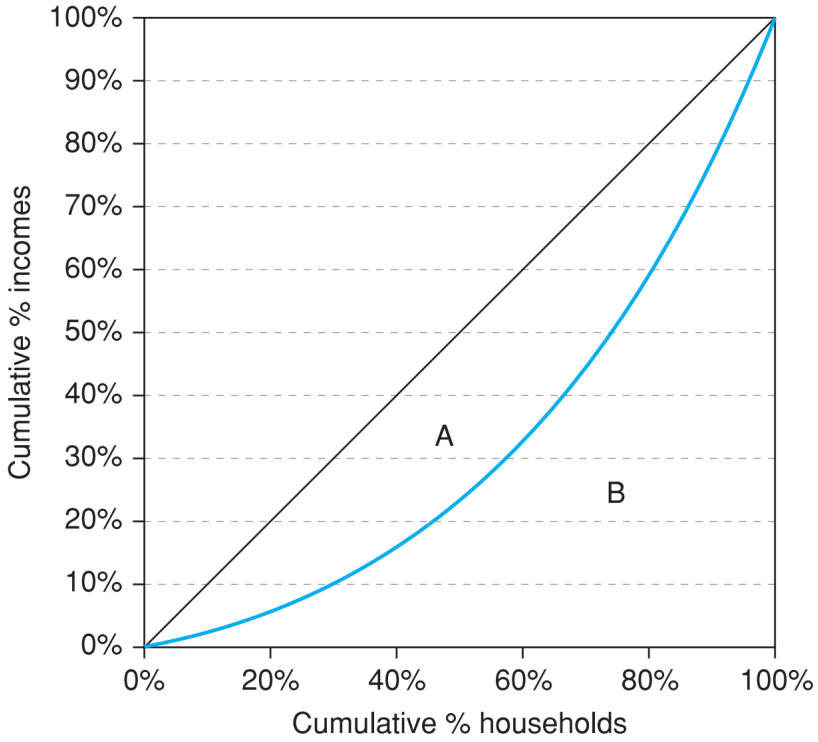
unlimited workforce for manufacturing. But manufacturing is not able to absorb all of them quickly. As wages in manufacturing are usually higher than the agricultural sector, it contributes to an increase in average income. And it concludes with income inequality. However as development in the manufacturing sector catching up, all surplus labor from the market is being absorbed which is called turning point and it concludes with an inelastic supply of labor (Perkins et al., 2013, p.174).

3.1.3 The Lorenz Curve and the Gini coefficient

One of the most popular tools to measure income inequality is the Lorenz curve invented by Max Otto Lorenz in 1905 in his "Methods of Measuring the Concentration of Wealth" article published in Publications of the American Statistical Association (Kleiber, 2007). Lorenz was the first scholar who showed the relationship between the cumulative percentage of the population and the cumulative percentage of total income as a form of a graph (Basmann et al., 1990). Based on the Lorenz Curve households (people) with their orders from the poorest to richest are expressed in the horizontal axis and cumulative share of income is observed in the vertical axis which is among 0 and 100 % (Barrow, 2009). The 45-degree line in the curve shows perfect equality and income inequality is getting bigger when the distance of the curve increases from that line and the curve has to be located below the perfect equality line as the households ranked from poorest to richest (Barrow, 2009; Perkins et al., 2013, p.170).

The Gini coefficient was invented by Italian statistician Corrado Gini in 1912 and it is another tool to measure income distribution. It gained based directly from the Lorenz curve and calculated by dividing the area A to the sum of areas A and B: G=A/A+B (Barrow, 2009). The result should be between 0 and 1. Although 0 expresses perfect (total) equality, on the other hand, 1 shows perfect inequality (the income is owned by one household). Both of these results are impossible in real life, but the lower value of G means less inequality which should be the main aim of all economies. Besides that its only useful method as a comparative measure for comparing different countries or regions or following inequality trends over time (Barrow, 2009; Perkins et al., 2013, p.170).

Figure 7. Lorenz Curve



Source: Barrow (2009)

According to the World Bank (2020): "Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.".

3.2 FDI and income distribution

Analyzing FDI's effect on income inequality is crucial to understand the characteristics of catching up economies' sustainable development. According to the OECD (2020): "Foreign direct investment (FDI) is a category of cross-border investment in which an investor resident in one economy establishes a lasting interest in and a significant degree of

influence over an enterprise resident in another economy. Ownership of 10 percent or more of the voting power in an enterprise in one economy by an investor in another economy is evidence of such a relationship. FDI is a key element in international economic integration because it creates stable and long-lasting links between economies. FDI is an important channel for the transfer of technology between countries, promotes international trade through access to foreign markets, and can be an important vehicle for economic development."

Zhang and Zou (2012) also argued that FDI is closely connected with economic growth. Rising FDI is seen as an outcome of export in East Asian developing economies. Besides that, FDI is one of the several factors to contribute economic development of a country. Types of FDI or initial and current conditions in a country also affect the influence of FDI on the development. It plays an important role in accumulating foreign exchange and domestic saving by filling some underdeveloped areas and using new skills and access to new technologies during the process also contributes to the development of human capital (Zhang & Zhou, 2012). Although there is always a risk to hurt local firms who are behind advanced technologies and cannot attract high-educated employees because of low wages it contributes to the development of human capital with the help of training or additional education for specialization and the sensitivity of it is mainly determined by the quality of education in the host country (Todaro & Smith, 2009, p. 402). The quality of education and the cost of it are among the factors when investors decide to invest in a country (Dutta and Osei-Yeboah, 2013; Te Velde and Xenogiani, 2007).

On the other hand, it has some drawbacks like an increase in the wage gap in an economy and results in the dual economy (Heyman, Sjöholm & Tingvall, 2007). Usually, foreign firms are paying higher than domestic firms and trying to attract the best specialists with higher wages. Although it contributes to a rise in average wages in the country, it also widening the income gaps between groups in society. It also contributes to the transition period from the labor-intensive sector to a technology-based capital-intensive economy with its help on economic growth (Heyman, Sjöholm & Tingvall, 2007). One of the main reasons behind foreign firms' high wages is to prevent technology and experience transfer towards domestic companies (they have a comparative advantage because of the technology) and establishing loyalty to the company for keeping employees longer in the company (Heyman, Sjöholm & Tingvall, 2007).

On the other hand, foreign firms are not paying higher wages to all employees. Some factors affect the amount of wage to each employee, it can be related to gender, education, migration status, ethnicity, location, etc. (Heyman, Sjöholm & Tingvall, 2007). A higher level

of education is the most important factor among them which influences income distribution deeply (Lin, Kim & Wu, 2013). And the location is also crucial because not all of the regions of countries can attract an equal amount of FDI and wages are different for the same job in a different part of the countries or regions. In general, FDI concentrates on the coastal provinces or regions which are more suitable for trade and export, and as a result people in these regions earn more than inner regions which conclude regional inequality (Todaro & Smith, 2009, page 602).

FDI inflow enhances to attract advanced technologies to the country and contribute to economic growth (Borensztein, Gregorio & Lee, 1998; Mercereau, 2005). These technological innovations are accessed by multinational corporations that invest in the host country. Wang (1990) also mentioned FDI's relation to technological innovations and called "knowledge" that is used in the production process as the main function of FDI. And all of these processes increased domestic savings which results in domestic investment as well (Bosworth, Collins & Reinhart, 1999).

4 Literature review

4.1 Role of Institutions in the economic growth

According to North (1991) institutions are designed by people to form economic, social, and political interactions with the help of formal rules (constitutions, laws, property rights, etc.) and informal constraints (traditions, customs, sanctions, etc.). He explained the main purpose of the institutions with their role in eliminate uncertainty and launching new orders by decreasing information cost, spreading risk, and providing mobility of capital (North, 1991). Menard and Shirley (ed. 2005) added securing property rights and cutting transaction costs to the main characteristics of institutions. These two indicators are more crucial mainly during investment in a country. If transaction costs are high without a reason or property rights are not secure, it affects the investment decision and results with higher returns of limited people gains thanks to rent-seeking activities or corruption not to intensive production or using advanced technology in it (ed. Menard and Shirley, 2005). They mentioned the state's crucial role in providing a productive business environment in the country to attract investment. According to Kuznets (1973), advanced technologies as a result of the development of science are one of the most important factors of economic growth and for him steam engines and electric power usage was also positive feedback of effective institutions.

Acemoglu, Johnson & Robinson (2004) argued that institutions' role in economic growth as more important as geography and culture factors. Good institutions stimulate people to invest, take risks, bring innovation on production, benefit from high-quality education and save for the future which helps in gaining wealth and well-being of the population (Acemoglu, Johnson & Robinson, 2004).

Rodrik (2000) also mentioned institutions' role in economic growth and explained two ways: blueprinting and experimentalism/gradualism to establish efficient institutions in countries. He stressed the importance of non-market institutions together with the market economy and argued that the market economy cannot operate well without non-market institutions (Rodrik, 2000). He divided these market-supporting institutions into 5 types:

Property rights, regulatory institutions, institutions for macroeconomic stabilization, institutions for social insurance, and institutions of conflict management (Rodrik, 2000).

Political, economic, religious, social, and other interactions are shaped by institutions (Acemoglu, Johnson & Robinson, 2002; North, Wallis & Weingast, 2006; North, 1990; Rodrik, Subramanian & Trebbi, 2002). And according to North, Wallis & Weingast (2006) building sophisticated and complicated organizations that made goods and services more reachable, invest in research and development and coordinate human behavior is the main characteristic of developed economies. Political and economic systems are dependent on each other and successful economies are that countries can provide transparency and freedom in both of them (North, Wallis & Weingast, 2006).

4.2 Economic growth and income distribution

Previous studies have examined the relationship between economic growth and income distribution. According to Kuznets (1955), economic growth has a negative impact on income distribution in the early years of development, especially among rural-urban regions. Although, income inequality during the beginning of the transition from agriculture to industrialization increases, it drops by a sustained rise in economic growth when urbanization happens from low-wage rural sectors to high-wage urban sectors (Kuznets, 1955). On the other hand, Deininger and Squire (1997) reject the Kuznets hypothesis and explained that the theory has not been proved in 90 percent of economies that have been tested as a result of countries for 30 years' time period.

Rodrik (1994) pointed out the view that equal distribution of income and wealth is important especially in the early stages of development, how South Korea and Taiwan succeeded in 1960. And he argued that the reasons behind the development of South Korea and Taiwan are equal income distribution and access to high-level education which other East Asian countries were not able to manage (Rodrik, 1994).

On the other hand, according to Lewis's surplus labor model, inequality is not the only result of economic growth, it is one of the most important causes of economic growth (Perkins et al., 2013, p.174). For him, high-income groups in society are necessary for investing and establish new enterprises or expand their business. Their saving and investment contribute to economic growth substantially. Otherwise, if all resources have shared equally,

there would not be enough motivation and resources to invest and it will reduce the speed of economic development (Perkins et al., 2013, p.175).

4.3 Globalization and income distribution

Race to the bottom is a definition using to explain the threat of globalization to the world economy. The term mainly is used to show how the rapid development of emerging economies affects the global economy and what kind of possibilities it brings with itself. It touches income inequality as well and determines income inequality as one of the main drivers behind economic development to encourage it. Income inequality has brought some challenges to the global economy and made a great pressure on it.

According to Roach (2006), globalization resulted in 'global labor arbitrage' which is distinguished with high-wage jobs replaced with low-wages in the manufacturing and service sector, and the trend moved from developed to developing world. This process started with the reform in China, India in the 1980s, and the collapse of the Soviet Union in the 1990s. As a result approximately 1.46 billion workers penetrated to the labor market till the 2000s (Freeman, 2005). Although they have existed before, it could not connect to the global labor market and did not participate in the production and consumption process (Freeman, 2005). According to Olney (2013), reducing labor and environment standards to attract FDI to countries is one of the main drawbacks of globalization. He argues that multinational companies are interested in investing in countries that own less strict standards and as result countries compete with each other to attract FDI with the price of lower standards (Olney, 2013). Then lower labor standards let the multinational companies invest in the countries and that process hurts the labor market and results in imbalances in the global market (Olney, 2013). Besides that, sometimes FDI flows to the countries which have poor institutions and it also stimulates anti-democratic regimes in those countries (Kolstad and Wiig, 2012).

Globalization helps the developing countries to participate in the global market with their comparative advantage products and it helps the economic growth and development of these countries. Although one of these countries which benefited more from globalization is China with its great success on increasing GDP, actively penetrating into the world market, attracting FDI, and reducing poverty. On the other hand, it brings income inequality besides other drawbacks which have peaked its record in 2008. And according to the Gini coefficient (the formula used to calculate the income inequality ranging from 0 to 100), China is one of

the worst (Jain-Chandra, Khor, Mano, Schauer, Wingender & Zhuang, 2018). The main drivers of income inequality are provincial and rural-urban distributions which are responsible for 11 percent and 35 percent respectively in 2013 (Jain-Chandra et al., 2018). Lower quality of education in rural areas, lower payments to highly educated people and the hukou registration system which limits urbanization (in that way the system prevents access to high-quality education, healthcare and high-wage jobs in big cities) are playing an important role in this process (Liu, 2004; Zhang, 2016). Although the hukou registration system provides more free services as subsidized food, urban employment, subsidized healthcare, housing for urban people and secure urban people with jobs in state-owned enterprises, rural people are being deprived of these incentives and that is one of the main reasons of rural-urban income inequality (Liu, 2004).

According to Zhuang, Kanbur & Rhee (2014) besides globalization, technological change and market-oriented reforms are also an important part of economic growth and income distribution. Technological change makes skilled workers gain an advantage in unskilled workers and earn more because of their knowledge of advanced technologies. As a result of globalization, trade integration happens and it also gives an advantage to skilled workers.

Although the trend of income inequality is going to fall, inequality in access to education, social safety net, and financial services is still a big challenge in the country (Jain-Chandra et al., 2018). According to Alesina and Perotti (1993), income inequality results in political instability in counties because of the absence of a wealthy middle class. On the other hand, more equal income distribution contributes to the growth of emerging economies and accelerates the process (Alesina and Rodrik, 1994).

4.4 FDI and income distribution

Tsai (1995) explained the results of FDI with these two hypotheses: Developmental/ modernization hypothesis and World system/ dependency hypothesis. Modernization hypothesis has been established based on both the marginal productivity theory's orthodox economic concepts and the tendency of the function of saving and consumption (Tsai, 1995). For that approach before the distribution of the output, it has to be produced sufficiently. Inequality is an unavoidable process at the beginning of the development as a precondition to providing everyone with equal opportunities (Tsai, 1995). As it is expressed in Kuznet's

inverted-U curve hypothesis although income inequality rises at the early stages of development, it tends to decline when sustainable development has been succeeded in time. The number of employees is increasing in the modern high-income sector of the economy in the early years which enhances income inequality among the population (Tsai, 1995). After that period when the sufficient output has provided and labor transformation from traditional agriculture to the modern manufacturing and service sector has happened, the surplus labor in rural areas shifts to manufacturing, and income in the agriculture sector rises to the level of manufacturing which contributes to a decline in income inequality (Tsai, 1995).

On the other hand, FDI contributes to the growth of some leading sectors which then shows its positive effects on income distribution (Tsai, 1995). Increasing workplaces with lower wages in East Asia's Export-processing zones are good examples of it (Tsai, 1995). It contributes to the labor share and plays a significant role on distribute income more equally. According to modernization theorists, development policy or economic system is also an important driver of income equality (Tsai, 1995).

The dependency theory researched inequality issues based on the world economy and historical perspective (Tsai, 1995). Based on that theory income inequality is affected mainly by social control or organization of production and a country's status among the global economy and these are the main determinant of income distribution in that country (Tsai, 1995). Industrialization in the less-developed countries enhances to form a new social class that is called "labor elites" that employees who are working in international sectors (Tsai, 1995). These elites earn almost 10 times more than average wages and it contributes to the increasing wages in the capital-intensive traditional sectors which results in a rising trend in unemployment in the traditional sectors (Tsai, 1995). As a result although some people's income rises, some of them lose their jobs, and in that way, income distribution is getting worse (Tsai, 1995). Additionally, sometimes labor elites are using the state's power for their rent-seeking activities to manipulate it with the help of economic cum political alliances with the states which provokes income inequality (Tsai, 1995).

According to Deardorff and Stern (1994), FDI contributes to income distribution by attracting low-skilled labor to the manufacturing sector (Choi, 2006). Basu and Guariglia (2007), Tsai (1995), and Choi (2006) found out that income inequality and FDI are positively related. Choi (2006) analyzed FDI's effects on FDI in 119 countries and determined positive relations between them.

5 Data and methodology

5.1 Model 1: Panel data analysis

5.1.1 Data Description

The World Bank Data has been used as the main data source for this empirical research. The data has been collected for nine Asian economies (China, Hong-Kong, Singapore, South Korea, Malaysia, Thailand, Indonesia, Philippines, and Vietnam) between 2000 and 2018. In total, 7 variables have been used for analysis: the Gini index, net FDI inflow percent of GDP, health expenditure per capita in US dollars, urban population, unemployment level, real GDP per capita constant, and export volume in US dollars. The dependent variable of the econometric analysis is the Gini index, which has been used as an indicator of income inequality. The main explanatory variable is net FDI inflow as a percent of GDP.

Table 1. Descriptive Statistics

Variable	**Observation**	**Mean**	**Standard Deviation**	**Min**	**Max**
Gini Index	70	39.13143	4.220809	30.2	47.7
Net FDI Inflow % of GDP	171	7.45677	10.52902	-2.75744	58.51875
Health Expenditure per capita US dollars	144	216.6148	311.6894	4.648056	1309.97
Urban Population	171	$1.03*10^8$	$1.96*10^8$	4027887	$8.24*10^8$
Unemployment	164	3.700789	1.755077	0.4892	11.51
Real GDP per capita constant US dollars	171	13608.57	15169.38	765.1857	58247.87
Export volume US dollars	171	$3.87*10^{11}$	$5.08*10^{11}$	$1.72*10^{10}$	$2.65*10^{12}$

Source: World Bank, 2019

Looking at the table above, it is obvious that the Gini Index has missed observations in comparison with other indicators, due to unavailable data for previous years. Gini index is shown in percent and ranges from 30.2% to 47.7%. The average Gini index for 8 Asian countries is about 39% with a small deviation. Net FDI inflow is a calculated difference between FDI inflow and outflow and shown as percent of GDP of countries. Some of the countries have negative net FDI inflows, while some of them have a substantial amount of FDI inflow, which is more than half of the GDP. The average net FDI inflow for 8 Asian countries is about 7.4% of GDP. Health expenditure per capita is measured in US dollars and substantially different among selected countries. Per capita health expenditure ranges from just above 4 US dollars to more than 1300 US dollars. The average urban population of target countries is about 103 million people, which ranges substantially from 4 million to 824 million people. due to the high range outlier is expected on this variable. Check for outliers has been conducted for urban population prior to regression analysis, outliers have been detected for the urban population more than 400 million people. I have dropped outliers from the urban population prior to estimation results. Since dropped outliers belong to China, separate time series analysis has been conducted for China in the second model of this paper. The unemployment level ranges from 0.5% to 11.5% among Asian countries during 2000-2018. GDP per capita is measured in terms of real value using a single year as a base. Real (constant) GDP per capita is a much better measure than nominal (current) GDP per capita since it considers the inflation level of the country. Real GDP per capita for target Asian countries ranges from 765 USD to 5,8247 USD, while the average is equal to 13,608 US dollars. Finally, export in terms of US dollar ranges between 17 billion USD to 2,650 billion USD.

Below histogram shows the distribution of the dependent variable (Gini index). Looking at the below figure Gini index is not clearly skewed. Based on the histogram below, the majority of countries have a Gini index between 35% - 40%. All explanatory variables are positively skewed.

Figure 8. Histogram for Gini index

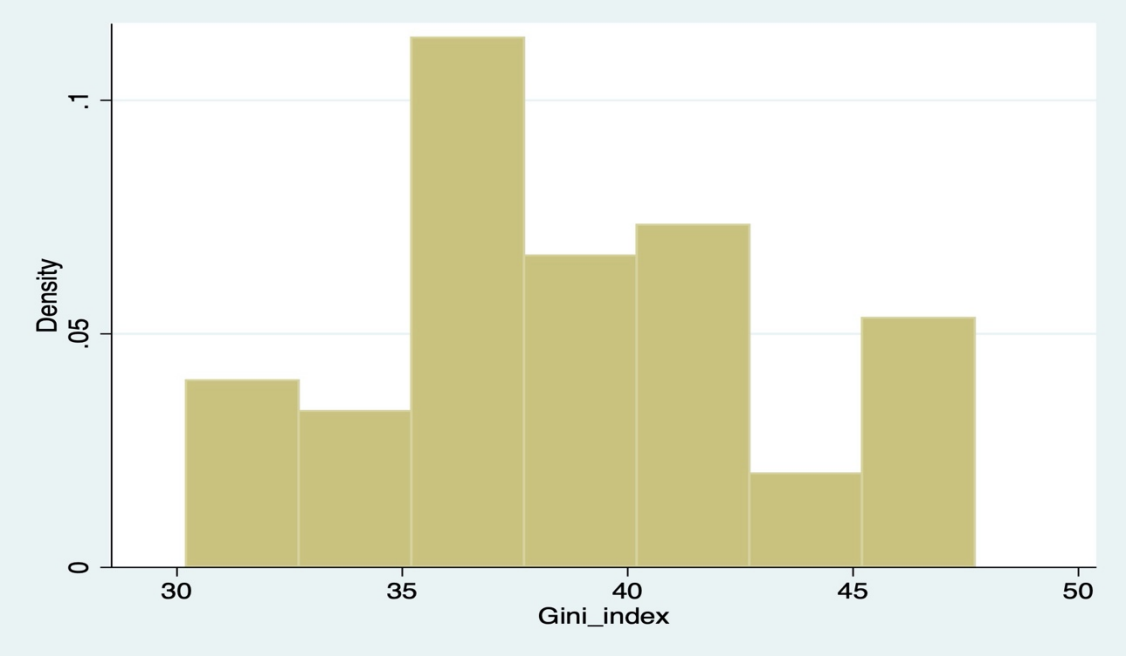
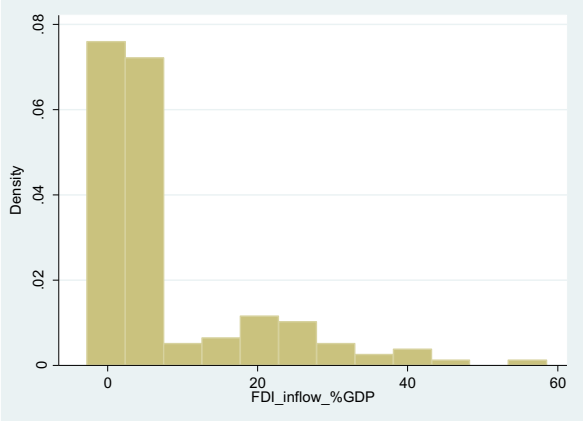


Figure 9. Histograms for net FDI inflow and urban population



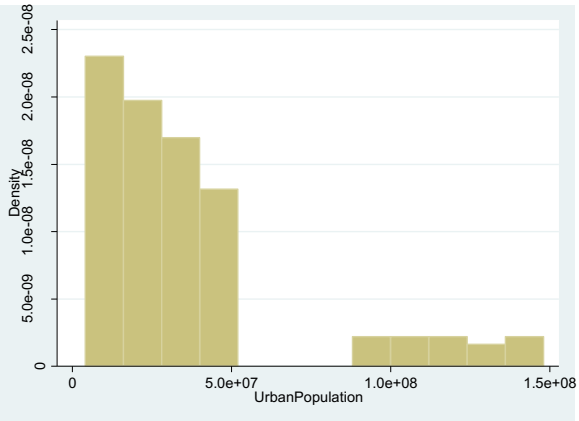


Figure 10. Histograms per capita health expenditure and unemployment

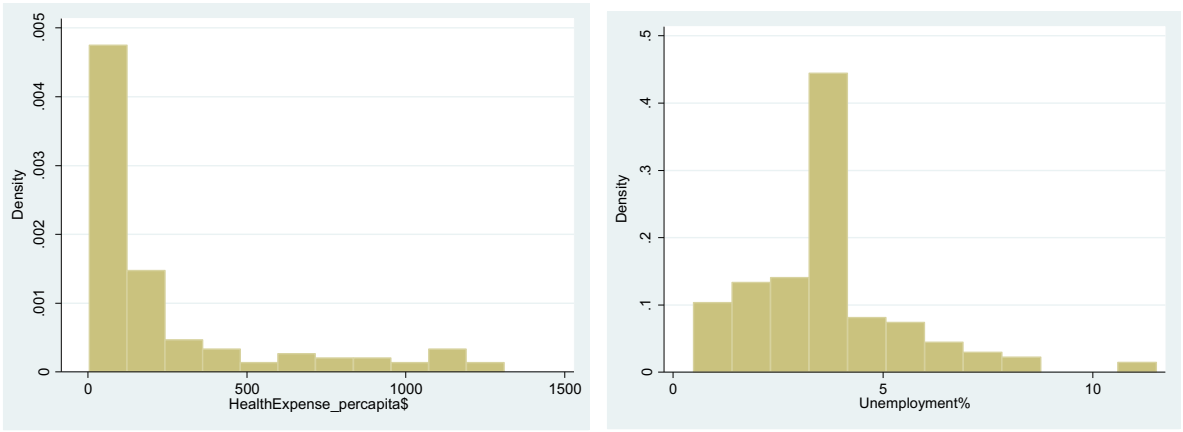
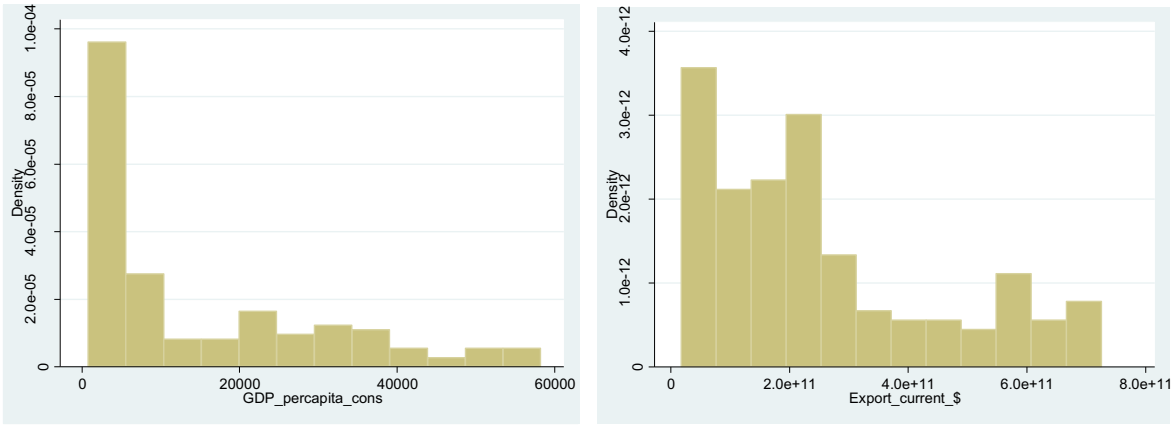


Figure 11. Histograms for real GDP per capita and export volume



5.1.2 Methodology and estimation results

Model for our empirical panel data analysis is as below:

$$Gini\_index = \beta 0 + \beta 1 * fdi\_inflow\_gdp_{it} + \beta 2 * healthexpense\_percapita_{it} + \beta 3 * urbanpopulation + \beta 4 * unemployment_{it} + \beta 5 * gdppercapita\_cons_{it} + \beta 6 * export\_current_{it} + a_i + \varepsilon_{it}$$

Since STATA regression provides only 2-sided test, we have made 2-sided hypothesis for each explanatory variables.

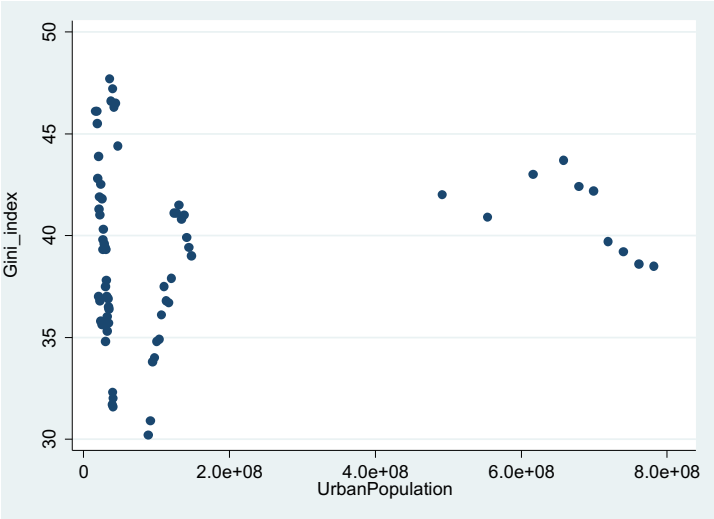
H0: Coefficient=0 (null hypothesis: variable has no significant effect on Gini Index)

H1: Coefficient≠0 (alternative hypothesis: variable has a significant effect on Gini Index

We reject the null hypothesis when the p value is smaller than the significance level (usually 5%).

Prior to regression results, I have detected and removed outliers for the urban population, which is higher than 400 million people.

Figure 12. Outliers in urban population



Assuming that all explanatory variables are strictly exogenous, the application of pooled OLS would not provide proper results. Thus, I have used the Hausman Wu test to compare Fixed effects and Random effects, under the assumption of a strictly exogenous explanatory variable. As a result of the Hausman Wu test, I have found out within estimation (fixed effect estimation) is preferred to random effects estimation.

Table 2. Within estimation (fixed effect estimation) results

Hypothesis	**Variable**	**Coefficient**	**Standard Error**	**T statistics**	**P value**	**Hypothesis decision**
Ho_1	Fdi_inflow_gdp	0.8514175	0.2181460	3.90	0.000***	Rejected
Ho_2	Healthexpense_percapita	0.0127194	0.0164415	0.77	0.443	Accepted

Ho_3	Urbanpopulation	$2.06*10^{-7}$	$4.10*10^{-8}$	5.02	0.000***	Rejected
Ho_4	Unemployment	0.072038	0.2050986	0.35	0.727	Accepted
Ho_5	Gdp_percapita_cons	-0.0021912	0.0009653	-2.27	0.028**	Rejected
Ho_6	Export_current_	$-7.78*10^{-12}$	$7.85*10^{-12}$	-0.99	0.327	Accepted

- Significant only for 10% - *
- Significant for 10% and 5% - **
- Significant for all 10% ; 5% and 1% - ***

Looking at the above Table 2, these variables seem to have a significant impact on income inequality (Gini index): net FDI inflow percent of GDP, urban population, and real GDP per capita. The positive impact of the main explanatory variable, net FDI inflow, holds with expectations. 1% increase of the share of net FDI inflow over GDP is expected to increase income inequality by 0.85%. The impact of the urban population is very small; if the urban population increases by 10 million people Gini coefficient increases only by 2.06%. An increase in real GDP per capita leads to a very small decrease in income inequality. 1 US dollar increase in real GDP per capita will lead to a 0.002 percent decrease in the Gini index.

5.2 Model 2: Time series analysis

5.2.1 Data description

Time series analysis has been conducted in Model 2. The data has been extracted from the World Bank for China during the time period of 2000-2018. In total five variables have been used for the second model: Gini index measured in percent, net FDI inflow percent of GDP, the population of large cities, high technology exports measured in US dollars, and GDP per capita PPP which considers purchasing power of people. Similar to the first model, the dependent variable of the second model is the Gini index, while the main explanatory variable is net FDI inflow as a percent of GDP.

Table 3. Descriptive statistics of Model 2

Variable	Observation	Mean	Standard Deviation	Min	Max
Gini Index	10	41.02	1.901265	38.5	43.7
Net FDI Inflow % of GDP	19	3.163978	0.9871476	1.367677	4.554254
The population of large cities percent of total	19	3.0927786	0.0220187	3.070701	3.144938
High technology exports US dollars	11	$5.37*10^{11}$	$1.25*10^{11}$	$3.43*10^{11}$	$6.56*10^{11}$
GDP per capita PPP	19	9140.616	4910.971	2936.288	18236.61

Source: World Bank, 2019

The Gini index, the dependent variable of model 2, has missing observations due to unavailable data in the World Bank database. Gini index ranges between 38.5% and 43.7%, with an average of 41 percent. Net FDI inflow in China holds only a small portion of GDP with an average share of 3.16%, ranging between 1.36% and 4.55%. The population of large cities has nearly 3% of the total population on average. The average high technology export of China is about 537 billion US dollars during the 2000-2018 period. GDP per capita PPP in China ranges between 2,936 USD and 18,236 USD during an 18-year period.

Figure 13. Histogram for Gini Index (China)

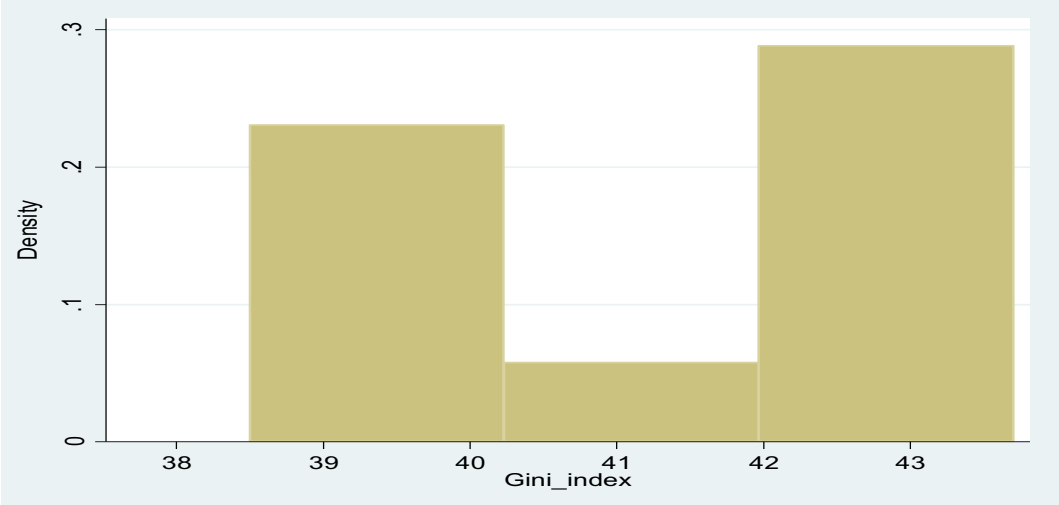


Figure 14. Histogram for net FDI inflow and Large city population

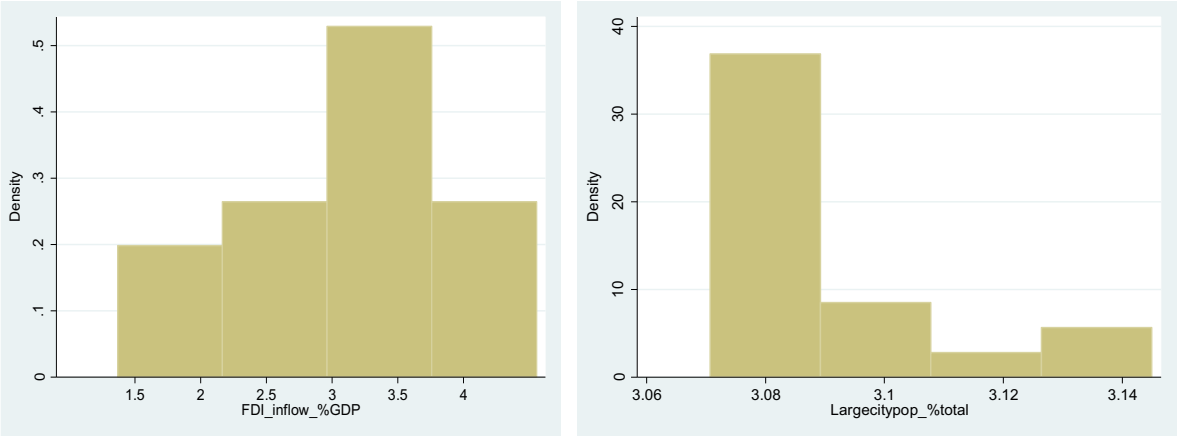
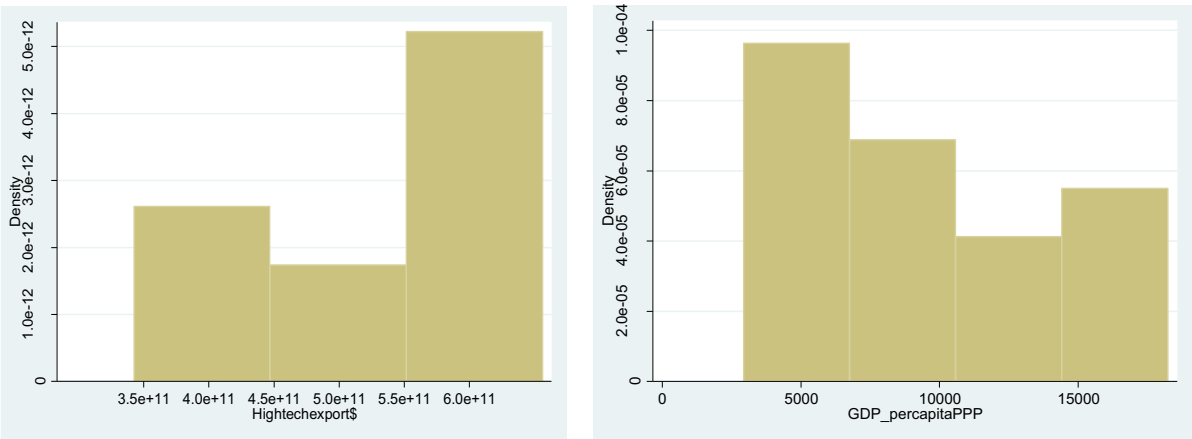


Figure 15. Histogram for high technology export and GDP per capita PPP



The above histograms show the distribution of variables for the second model. Looking at figure 13, it is obvious that the Gini index for China mainly changes around 43%. Figure 14 shows that net FDI inflow is negatively skewed, while the population of large cities is skewed positively. High technology exports of China is mainly observed above 600 billion USD. GDP per capita PPP is observed with right-tailed skewness.

5.2.2 Methodology and estimation results

Prior to the regression results, test for autocorrelation has been conducted, since time-series data may contain a serial correlation issue. Using the Durbin Watson method, it has been found out that no autocorrelation problem is detected. Thus, it is not needed to use cluster regression.

Model for time series analysis is as below:

$Gini\_index = \beta 0 + \beta 1 * fdi\_inflow\_gdp_t + \beta 2 * largecitypop\_total_t + \beta 3 * hightechexport_t + \beta 4 * gdp\_percapitappp_t + \varepsilon_t$

Two-sided hypothesis tests have been conducted for each explanatory variable.

H0: Coefficient=0 (null hypothesis: variable has no significant effect on Gini Index)

H1: Coefficient≠0 (alternative hypothesis: variable has a significant effect on the Gini Index).

We reject the null hypothesis when the p value is smaller than the significance level (usually 5%).

Table 4.Regression results of time series analysis

Hypothesis	**Variable**	**Coefficient**	**Standard Error**	**T statistics**	**P value**	**Hypothesis decision**
Ho_7	Net FDI Inflow % of GDP	-2.06989	0.5265515	-3.93	0.029**	Rejected
Ho_8	The population of large cities percent of total	307.6761	40.48318	7.60	0.005***	Rejected
Ho_9	High technology exports US dollars	$6.31*10^{-12}$	$2.55*10^{-12}$	2.47	0.090*	Rejected
Ho_{10}	GDP per capita PPP	-0.001933	122.0914	-7.23	0.005***	Rejected

- Significant only for 10% - *
- Significant for 10% and 5% - **
- Significant for all 10%; 5% and 1% - ***

Looking at estimation results provided in Table 4, all explanatory variables except high technology exports have a statistically significant impact on the Gini index at a 5% significance level. Among these variables, the population of large cities and GDP per capita PPP have a significant impact on the Gini index at a 1% significance level, too. Contrary to panel data analysis results, in this model net FDI inflow has a negative impact on the Gini index. Based on the results in Table 4, if the share of net FDI inflows over GDP increases by

1%, the Gini index is expected to decrease by 2%. Similarly, GDP per capita PPP has a very small negative impact on income inequality, 1 US dollar increase in GDP per capita PPP leads to only a 0.002% decrease in the Gini index. Additionally, the population of large cities is expected to have a strong positive impact on income inequality, which is statistically significant at a 1% significance level. Furthermore, high technology export volume show a statistically significant impact only at a 10% significance level.

5.3 Limitations

The main limitation of this study is the lack of data availability for variables used in both models. Especially, datasets used for panel data and times series analyses do not contain a sufficient number of observations for the dependent variable of both models, Gini index. For panel data analysis, the Gini index was only available for 10 years, although the time period of 2000-2018 has been chosen. Another limitation was about the detection and removal of outliers in panel data analysis of the first model. An outlier was detected for the urban population, which belongs to China. Upon the drop of outliers on the urban population, China was automatically removed from panel data analysis. Considering this limitation, I had to conduct a separate time series analysis for China, the second model. The third limitation was the limited number of data for variables such as health expenditure for China, which prevented to use the same variables as in panel data analysis. Thus, I have used other proxy variables, which are available for China.

6 Conclusion

This thesis aimed to examines the impact of economic growth on income distribution in emerging East Asian emerging economies from 2000 to 2018. As globalization's negative outputs such as income inequality, human rights issues, and environmental problems are discussing widely among economists, and income inequality is mentioned especially by the advocates of the race to the bottom theorists, I decided to test some indicators of economic growth's effect on income distribution.

More precisely, in the first model 6 indicators' effect on income distribution has been tested for South Korea, Singapore, Hong-Kong, Malaysia, Indonesia, the Philippines, and Vietnam. These indicators are net FDI inflow percent of GDP, health expenditure per capita in US dollars, urban population, unemployment level, real GDP per capita constant, and export volume in US dollars. As a result of my regressions, net FDI inflow percent of GDP, urban population, and real GDP per capita has an effect on income distribution. Although, a rise in FDI and urban population results with an increase in income inequality, real GDP per capita's rise concludes with a decrease in the trend.

In the second model, 4 indicators - net FDI inflow percent of GDP, the population of large cities, high technology exports measured in US dollars, and GDP per capita PPP have been tested with time series analysis for only China and all of these indicators' impact on income inequality has been proved. In contrast to the first model, a rise in the amount of FDI influenced positively to the income distribution in China besides with GDP per capita PPP. On the other hand, the population of large cities and high-tech exports contributed to income inequality and helped to distribute it unequally.

In this essay economic growth's effect on income inequality has been tried to examine. Although limited data in the World Bank's database on target countries did not let to test a longer time frame, some factor's effect on income distribution on 18 years has been explained.

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Appendix A

Fixed-effects (within) regression — Number of obs = **55**
Group variable: **country** — Number of groups = **6**

R-sq:
within = **0.7064**
between = **0.1191**
overall = **0.0076**

Obs per group:
min = **4**
avg = **9.2**
max = **18**

F(**6,43**) = **17.24**
corr(u_i, Xb) = **-0.9556** — Prob > F = **0.0000**

gini_index	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fdi_inflow_gdp	.8514175	.2181468	3.90	0.000	.4114826	1.291352
healthexpense_percapita	.0127194	.0164415	0.77	0.443	-.020438	.0458768
urbanpopulation	2.06e-07	4.10e-08	5.02	0.000	1.23e-07	2.88e-07
unemployment	.072038	.2050986	0.35	0.727	-.3415828	.4856587
gdp_percapita_cons	-.0021912	.0009653	-2.27	0.028	-.0041379	-.0002445
export_current_	-7.78e-12	7.85e-12	-0.99	0.327	-2.36e-11	8.05e-12
_cons	36.27993	3.030935	11.97	0.000	30.16746	42.39239
sigma_u	16.519516					
sigma_e	1.504622					
rho	.99177242	(fraction of variance due to u_i)				

F test that all u_i=0: F(**5, 43**) = **50.06** — Prob > F = **0.0000**