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The impact of foreign direct investment on inequality: Evidence from Southeast Asia

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Summary

Income inequality has always been a problem, especially in Southeast Asia. It is vulnerable to create a disparity and unjust feeling among the society which could potentially raise a social and political conflict within a country. On the other hand, nowadays FDI has been sought by countries in this globalization era in order to sought economic development, income growth and employment absorption. Southeast Asia has been known for its developing attraction for hosting foreign investment. The region has always taken part in attracting attention, particularly in the theme of potential market, resources and investment environment. However, there are still only several studies that explain the relationship of FDI as the economic integration instrument towards income inequality. These studies also present contradicting results in explaining the FDI-income inequality nexus. Therefore, this research aims to to compare and explain the impact of sectoral foreign direct investment towards income inequality in the region of Southeast Asia. It also aims to provide results with the presence of country's capability in explaining the relationship between FDI per sectors and income inequality, which derived from the capability approach. Lastly, it also aims to provide evidence and suggestion on factors from county's set of capabilities that significantly affecting FDI and income inequality relationship.

On that regards, this research confirms the non-linear relationship between the three major FDI sectors towards gini index of income inequality. Furthermore, results also confirm the significance of capability approach concept in determining the relationship of FDI and income inequality. The presence of three country's capabilities, namely, human, infrastructure, and government capability are significant in providing instantaneous effect towards FDI in effecting income inequality. However, the significant level only appears in service and manufacturing sectors. Agriculture sector, on the other hand, does not appear to be significant, even in the presence of capability approach. From this result, human capability is arguably the most important capability in determining the impact of FDI towards income inequality as in often appear to be a significant mediating variable. Their indicators of Gross National Income (GNI) and tertiary enrollment rates are mostly significant in all final regression models in each FDI sectors. Some indicators from infrastructure and government capability are also appear to be significant at times with mobile subscriptions and corruption index as the most often indicators to have significance level.

Keywords

Income inequality, Greenfield inward Foreign Direct investment, Agriculture sector, Manufacturing Sector, Service Sector, Capability Approach, Human Capability, Infrastructure Capability, Government capability

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Dedication

This thesis is a dedication for my parents Deana Widjaja and Yaya Winarno Junardy

Abbreviation

FDI	Foreign Direct Investment
SEA	Southeast Asia
MNE	Multinational Enterprise
UNCTAD	United Nations Conference on Trade and Development
ASEAN	Association of Southeast Asian Nations
GDP	Gross Domestic Product
HDI	Human Development Index
GNI	Gross National income
WIID	World Income inequality Database
UN	United Nation
PCA	Principle Component Analysis
USD	United States Dollar

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Chapter 1: Introduction

1.1 Background

The world has globalized; a popular terminology which describe the opening of a mutual societies influenced by the significant technological change (Sarbu, 2015). It is an open-concept which has polarizing opinions of definition throughout the world. But as described in Kali and Ryes (2006) Globalization has always been associated with the effect of international economic integration. Few studies on economic integration (some refer to globalization) focus on trade volume between countries to define 'integration'; a perspective that market expansion is achieved. However, many others also has confirmed that integration leads to economic networking process between regions, countries, and cities (Wall, Burger and Knaap, 2011)

One famous way to create network is by foreign direct investment (FDI); when a corporation originated in one country operates business in another country by joint venture, creates wholly – owned affiliation, or acquiring local company (Moran, 2012). It does not only expanding market, but create relationship through employment, knowledge transfer, and improvement of host country's factor of production. In fact, foreign direct investment until now is one of the huge factors in country's economic growth (Mah, 2003). Thus, economic reforms and liberalized policies were adopted by countries to achieve better investment condition and economic growth.

Recognition towards how FDI affecting growth seems already well-known. Accordingly, government starts to shift focus from incentive based policies, such as taxes and subsidies, to capacity-building which concern in improving the likes of physical infrastructure, amenities, education level and public transport networks (Begg 1999; Burger *et al, 2012)*. Competition between regions and countries to receive FDI is indeed fierce. In the competitiveness research involving 29 European Countries showed that some regions were more competitive than others due to their capability in threatening others are higher than the threats they receive from other regions. Those regions are typically large geographically and sufficiently distinctive. (Burger, Knaap, and Wall, 2012).

It is understandable to realize the high competitive environment between regions as FDI provides benefits and spillover. Research found that foreign firms directly increasing regional productivity through its own higher productivity and indirectly through the raise of domestic firm's productivity (Girma, Greenaway and Wakelin, 2001). The effect of FDI to growth and money distribution varies from one literature to another. In general, Multinational Enterprises (MNEs) adopting their specific advantages such as governance system, management structure, and distribution strategies. But once foreign investment applied, the MNEs are commonly unable to prevent those advantages spilling over to their local subsidiaries. Such spillovers may raise benefits and productivity, but how well domestic firms exploits and maximize the spillover is mostly related to the characteristics of host country (Gorg and Greenaway, 2004).

Accordingly, Borensztein, Gregorio, and Lee (1998) claimed technology capabilities and human capital in host country is an important factor for foreign direct investment to positively influence growth. They furthermore stated that FDI could sufficiently affecting economic growth only when the human capital in the host country surpassing the threshold to reach effective productivity. More recent study suggested the same; the level of education in the society matters for FDI to promote growth, while openness to trade is also matters (Leitao, 2012). Moreover, the study from Niel and Robert (2003) found that FDI only affects positively if the host country provides sufficient developed financial system. Salomon (2011) supports this statement. Involving 111 countries in panel research from 1981 to 2005, she argued that Host Country Factors (HCFs), in which consist of economic development level, human capital, and quality of political environment are able to affect the relationship between FDI and growth. The influence of FDI towards national growth is also defined by regime. Government that adopting an open and liberalized regime, which stimulates export – oriented FDI, tend to gain positive impact and sustained macroeconomic condition through FDI (Zhang, 2001).

Even though FDI are claimed to be a vehicle to achieve economic growth, inequality is another case; growth and sustained economy does not directly mean it is equally distributed. The acceleration of economic integration through FDI is unquestionable, but the benefits of it has not been evenly distributed (Bhagwati, 2004). In fact, FDI could lead to growth and inequality at the same time. In the growing condition particularly, the poor might still unable to access benefited from FDI that has a high-technology of production and, thus, leads to higher disparity between the poor and the rich (Basu & Guariglia, 2007). Based on the Gini Coefficient calculation, FDI leads to widening the gap of inequality (Choi, 2006). Moreover, FDI is seen to lift up the rich even higher while the poor is even poorer (Kuncera and Roncolato, 2011).

1.2 Problem statement

Globalization, growth, and inequality have always been a continuous debate and discussions. According to Ali (2007), growth in Asia leads to the increase in income and expenditures inequality. It was stated that these inequalities are the result of uneven growth. He furthermore argued that this unevenness are affected by the policies and structured transformation, in which including the rise of foreign direct investment throughout some specific areas. Southeast Asia becomes the role model to show how rapid growth becomes a solution to inequality and poverty. However, at the end of 1980s, the condition is the other way around. The contingent has a huge problem in minimalized the inequality gap as it keeps on becoming higher (Kohl, 2003). He furthermore claimed that the industrialization, in which majority are determined by FDI, agriculture, and rural development policies does not have a significant change in inequality. Moreover, globalization and foreign direct investment in Southeast Asia creates problem for inequality as education were not growing fast enough, thus, creating a huge gap of income between the high-skilled and low-skilled labor (Kohl, 2003).

Even though many findings confirm FDI leads to development and growth but the relationship of them dependent upon the ability of host country to gain the benefits of it, particularly when it comes to inequality (Tsai, 1994). Sen (1997) has an intriguing statement about inequality and capability. He argued that inequality is

concerning capabilities and freedom. In society level, each person converts their income into valuable achievements depending on their capabilities. Typically, each person's capabilities are different to another. Thus, it leads to unequal process to reach achievements for each individual. In this matter, Sen (1979) creates the capability approach. He stated that inequality and poverty is caused by the lack of capabilities among individuals to achieve the state of beings or doings (functions). As there are still few arguments among capability theorist, Sen stated that the focus on capabilities rather than utility is that each individuals have different capabilities to achieve the same opportunity (Sen, 1990; Osterlaken 2009). His framework upon basic capabilities to tackle inequality among individuals reflected on life expectancy, income, and education level. If human have the same basic ability, it will be a strong foundation toward equitable growth (Gasper, 2002).

Inequality and Sen's capability approach has been discussed, improved and criticized. Yet, it is still a pioneer in the thought of social justice through inequality and poverty (Sugden, 1993). In fact, the human development index, in which used worldwide to measure human development and their capabilities, was much based on the capability approach theory (Noorbakhsh, 1998). Capability approach and inequality has been a discussion massively in individual level. However, its usage does not solely feasible in one particular level. Instead, capability approach is claimed to be a 'social choice theory", which have the flexibility to measure different types of social issues, particularly justice (Oosterlaken, 2009). Therefore, this research tried to level it up into country perspective on the issue of income inequality. There are many literatures providing knowledge both on FDI to income inequality, and country's capabilities for development. But still few of them, if any, that integrate the concept of capability approach in country level to define the relationship of FDI to income inequality. In current situation around the world, these two topics become delicate issues. On one hand, foreign investment has been one of the prioritized specters in developing countries, especially in Southeast Asian. On the other hand, inequality his research use the basic idea of capability approach in country level to see the impact of FDI to Inequality.

1.3 Research Questions:

What is the impact of inward foreign direct investment towards income inequality in Southeast Asia from 2006 to 2015?

- What does the impact of FDI towards income inequality in each FDI sector?
- To what extend does the capability approach explain the impact of FDI towards income inequality?
- What are the significant factors that affecting FDI to reduce income inequality?

1.4 Research objective

This research aims to compare and explain the impact of sectoral foreign direct investment towards inequality in the region of Southeast Asia and Indonesia. It also tries to explain the relationship of FDI towards inequality using the capability approach. At the end, it sought to provide proven recommendations to the academic knowledge of urban studies and practitioners.

1.5 Significance of Study

South East Asia has always taken part in attracting attention, particularly in the theme of potential market, resources and investment environment. It is understandable remembering different aspect of resources and potential factors within it. Aside from the different characteristic between countries and geography, South East Asia keeps on building attractions which starts to be responded by investors around the world. Therefore, this study could contribute to the effort of governments to maximize the benefit of economic integration through FDI, particularly when it comes to income inequality. In fact, as a fast emerging region, income inequality is still a significant matter which always vulnerable and sensitive to create unjust felling among the societies and potential social conflict.

In testing FDI towards inequality, this study use an important concept of capability approach which proposed by Amartya Sen (1980). Capability approach implies the idea that achieving a state of being should be analyzed through the subject's capability rather than opportunity, especially when it comes to inequality. The use of capability approach is commonly in individual level (households) while in this research, the reference unit of capability is country (national level). However, the shift of subject in determining capability approach is not something new. Several research, including Sen as the developer himself, had used capability approach with country level data which exactly what this study intended to take. Hence, this study aim to contribute in presenting capability approach from a larger a level (country) and to what extend can it define the relationship between FDI and income inequality in country's perspective. This study also elaborates the use of classic human capability approach to be expanded in other aspect of capabilities of infrastructure and government.

In fact, explaining the relationship of inward FDI towards income inequality with the use of country's capabilities set is still lacking, especially in Southeast Asia region. Therefore, this paper aim to study and elaborate the condition of Southeast Asia's country's capabilities and what does these capabilities level means in the relation of FDI and income inequality within the countries.

Moreover, the relationship of FDI towards income inequality itself is still lacking both in academic literature and social awareness. Only few literatures produced which explained the link between FDI and inequality in Southeast Asia. Moreover, the results showed vary answer in explaining FDI to inequality. Therefore, this study shall be a useful addition to the varies of explanation and missing links by adopting the capability approach to measure country's capabilities in receiving FDI and reducing income inequality.

1.6 Scope and Limitation

In learning the effect of inward FDI and income inequality, the study will covers 8 countries membered of the Association of Southeast Asian Nations, namely; Cambodia, Laos, Malaysia, Indonesia, Philippine, Singapore, Thailand, and Vietnam. A panel data analysis will be operated for a period of 10 years from 2003 to 2012. In this scope and period, the limitation is indeed the fact that not all Southeast Asian nations are covered in the test. It covers 8 from 10 Southeast Asian countries that registered in ASEAN. This is a result from another limitation of data availability. Brunei and Myanmar are the 2 nations that uncovered in the test due to very limited

data for all country's capability indicators. Limited data availability is also limiting the test to have 2012 as the latest year. Indeed, more recent data would provide insights on later condition of the topic.

This analysis of this research only use secondary data for all the indicators that going to be analyzed. The decision of secondary data usage is mainly due to time and cost limit. As this study conducted in a specific thesis period of four months, a primary data collection such as focus discussions and survey from all countries is impossible. Therefore, this research take a generalized frame of country value and unable to compare country's characteristics such as population and country size.

As mentioned, this study conduct a secondary analysis used as the approach. On that regards, data availability would be vulnerable for data reliability and validity. If unavailability of data creates insignificant statistical result, then variables shall be presented with another available proxy, which requires a further argument on using specific indicators. Second is the data source as it prone to data validity. However, in this research data collection limited only to credible authentic resources which have strong partnerships with private, public, and academic institutions around the world such as World Bank, Euro Monitor Passport, etc. Thus, the limitation to only credible sources should also limit the invalidity of data.

Chapter 2: Literature Review/ Theory

2.1 Literature Review

2.1.1 Foreign Direct Investment

Foreign Direct Investment (FDI) has become an important driver in a global economy (Salomon 2011). In developed countries, FDI grows even faster than trade flows. These busy investment traffic are caused by the globalized system and eagerness of countries to create economic integration. Globalization is used by countries to seek more capitals and growth. According to the European Commission (2004), globalization is the interdependency between countries to produce goods and services and create markets. Al-Rodhan (2006) furthermore explained that countries are more interdependent due to the increasing dynamics of trades, capital flow, and technology. The needs of capital and productivity create FDI to be a fundamental engine for economic integration.

Growth is sought in every edge of the world. In the globalized era, development possibly achieved through creating network in order to increase flexibility to satisfy basic needs more affordable. In this context, investment is a major instrument to networking. Hence, investment can be seen as a support to country's socio economic development. In fact, investment is inevitably fulfill and developed all factors of production, which includes labor productivity, machineries, fixed or working capital, jobs, and diversification of production (Chirilă-Donciu, 2013).

There is a significant increase in FDI flows in at least the last three decades (Barios et al, 2005). However, in the early stage of integrated economy approach, FDI was overlooked. In 1970s, multinational investment was viewed to be a disadvantage towards local welfare and development. It derived to possible monopoly situation and created stiffed competition. However, from 1990s the perspective was shifting. FDI was rather seen as a complement to domestic performance through their spillovers (Blomstrom and Kokko 1995). In result, at the of 1990s, intra-firm trades by MNEs were estimated to 30% of total world trade; a much increase from previous decades (Caves, 1996).

In the last decade, competition among countries becomes stiffer to receive FDI. Governments are constantly improving conditions, typically by deregulating, to have an investment-friendly environment for MNEs to locate their businesses. In principle, there is a shift of focus from incentive-based policies to capacity-building concept. It concerns the capability of country such as infrastructure, technology, public transportation, and education (Wall *et al,* 2012). This movement is due to the benefits and spillovers by the effect of FDI that wished to be received by the host country. According to Barrios, Gorg and Stroble, (2004), the long term effect of FDI towards host country is indeed beneficial. Even though in the early period it might evoke the local firm's exit due to competition effect, in the long term FDI is claimed to have a positive impact on local firm expansion due to the positive externalities effect which received by local starts-up. Their finding also stated that the competition effect among FDI and local business is greater than competition from imports. This is due to the limitation of market size factor faced by imports. Thus, fast adaptation shall be done if local firms fancy the positive spillovers from FDI. In industry level, FDI intersect and shifting the value of supply and demand in specific industry. Although stimulating damage through competition, but a possible benefit to other sectors;

Multinational companies tend to create demand to local firms for strengthening their supply and demand channels and, thus, feeding local firms through their investments (Markusen and Vernables, 1999).

Receiving positive spillover from foreign enterprises is indeed the aim of domestic firms, but the way to receive it shall be thoughtful. There are at least four channels to gain spillover (Gorg and Greenaway, 2004). First, the most classic channel is through imitation. Domestic firms can learn and imitate the MNE's production process. Imitation could also be feasible for management practice. Imitating the process, procedure, and management structure from a typical larger production company could consequent increase in a productivity of local firms. However, should be note that imitation depends on the complexity of productions and scope of divisions (in managerial structure). Usually, imitation can be done to a rather easier production process. The second channel is acquisition of human capital. According to Haaker (1999) human capital is the most significant channel for spillovers. Usually, MNEs demand a rather high skilled labor and can be achieved via training and labors movement from home to host country. This movement creates an alongside working environment for the unskilled and skilled labors.

Third, competition could also be a key role of channeling. Competition is inevitable when MNE start to enter the local market, assuming to exclude possible monopoly situation. A higher competitive environment could consequent in local firms to start imitating higher production firms. Even when imitation is not possible, local firms would use the existing technology more efficiently which might leads to higher yields of productivity gain.

Fourth, it is rather more indirect source of channel via export spillovers. The fact that MNEs are operating business in foreign country is indeed means they have gone through exporting activities. Such exports typically involving fixed costs which in the form of localization of new market tastes, create transport infrastructure and also build distribution networks. These kinds of aspects converted into knowledge and imitation to local firms which potential penetration to expand in a foreign market.

Recognizing the benefit that FDI can make and possible channels of spillover, countries promote and attract foreign investment in many ways. It follows the criterion of investor's intention. There are at least four factors for host country to attract investment from Multinational Enterprise (MNE) (Cheng and Kwan, 1999). First is the infrastructure. Business needs efficient distribution to create effective intersection between customer and producer. Second factor is the presence of regional market. When goods and services produced for local needs, then local demand factor is crucial. Third is preferential policy. Investors sought to poach capital in an open, save and stable countries to create sustained business. The last but not least is labor cost (Janicki, Phanindra, and Wunnava, 2004). In fact, many MNEs opened their factory in a developing country that tends to have low labor and export cost, and in return, huge job opportunities provided to the region.

2.1.1.1 FDI in Southeast Asia

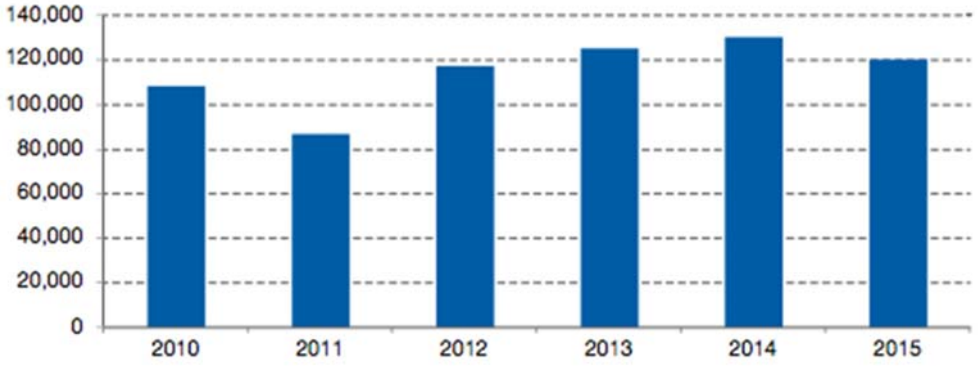
Foreign Direct Investment in Southeast Asia (SEA) is considered fast growing. Looking back to the status in which SEA have high potential developing countries, it seems movements of each of them are heading to welcoming FDI. Deficit

budget is typical in SEA trends as they sought to constantly developing. Thus, foreign investment is a fancy opportunity.

On investor's perspective, SEA is a unique and high potential opportunity with several competitive advantages. According to Sjoholm (2008), market access is a crucial factor that MNEs are attracted to. A fast growing quantity as well as potential quality of population provides huge human resources for labor-seeking investors. Sjoholm further stated that the access to raw material is also a major attraction. Indeed, Southeast Asia is geographically abundant of natural resources. Gaining benefit from it would worth millions of dollars for exploitations and production. This situation could lead to mutual interest between SEA and non-SEA countries. On one hand, SEA countries see the situation to absorb technology, employment, and economic growth. On the other hand, possible exploitations of natural resources could lead to billions of dollars profit. In fact, most of SEA countries have higher shares of FDI in mining than manufacturing (Sjoholm and Lipsey, 2011).

Following the fast growing market and economy, regional integration became main priority. In 1967, integrated regional organizations were held by SEA countries called as Associations of Southeast Asian Nations (ASEAN). Currently, 10 nations are member of the association. One of the major concerns is to strengthen the relationship among members and to create sustainability in a dynamic development condition (Keling *et al*, 2011). By the end of 2015, ASEAN agreed on establishing the key policy areas of integration. It includes trades in goods and services, intellectual property, human and social development, tourism, competition and consumer protection, energy, investment, and capital market. Each nation agreed to strengthened partnership through deregulations in order to create more resilience urban network and ease of trades.

Figure 1: Total FDI flows in ASEAN (Million USD)



Source: UNCTAD, P.3, 2016.

ASEAN is undoubtedly a considerable region to invest. However, the data (UNCTAD, 2016) shown that it does not consistently growing (see figure 1). The dynamic of ups and downs are still considerably high. In 6 years range, 2011 was the lowest FDI inflow and 2014 received the highest investment reaching 130 Billion USD. However, total FDI dropped by 8 percent in 2015 due to uneven performance of each country. Three countries experienced a reduction in FDI inflow, while two others received as much as in 2014. The rest five received higher FDI inflows. In three countries that received lower FDI were mainly caused by the declining sector of services, cross border Merger and Acquisition activities, and intercompany loans. In

total inflow of FDI, manufacturing industry rose significantly in 2015, reaching an all-time high record. Stable inward FDI also happened in intraregional investment. Direct investment from fellow ASEAN countries kept unchanged from 2014. However, those growth and sustained performance were unable to avoid the declining trend of total FDI inflow (UNCTAD, 2016)

Figure 2: World's FDI inflows percentage share

Group of economies/region	FDI inflows			FDI outflows		
	2014	2015	2016	2014	2015	2016
Developed economies	42.6	55.5	59.1	56.5	73.6	71.9
Europe	20.6	31.9	30.5	17.7	41.8	35.4
North America	17.4	22.0	24.3	28.1	23.2	25.2
Developing economies	53.2	42.4	37.0	37.7	24.4	26.4
Africa	5.4	3.5	3.4	2.3	1.1	1.3
Asia	34.8	29.5	25.3	32.9	21.2	25.0
East Asia	19.4	17.9	14.9	23.0	14.9	20.1
South-East Asia	9.9	7.1	5.8	7.1	3.5	2.4
South Asia	3.1	2.9	3.1	1.0	0.5	0.4
West Asia	2.3	1.6	1.6	1.8	2.4	2.1
Latin America and the Caribbean	12.8	9.3	8.1	2.5	2.0	0.1
Oceania	0.2	0.1	0.1	0.1	0.1	0.1
Transition economies	4.3	2.1	3.9	5.8	2.0	1.7

Source: UNCTAD, 2017, p. 45

In global perspective, Asia is still the most recognizable comparing to other developing region. Figure 2 above shows the share percentage of FDI inflow from more recent research of UNCTAD (2017). In bigger picture, it separates the share between developed economies and developing economies. In this point of view, it seems the last three years of 2014-2016, emerging markets had decreased in share which followed by an increase of FDI inflow in developed markets. Every region in developing economies shares their part in the downfall of FDI inflow in overall developing economies followed by Latin American and the Caribbean. Even so, East and Southeast Asia still hold the biggest share of FDI inflow in developing economies. However, both of them share the biggest downfall of FDI in flow comparing to other region with a decrease by 4.8 and 4.1 percent in 2 years, respectively (UNCTAD, 2017).

Even though in the last three years Southeast Asia experienced a decline FDI share, but in Global Investment Report by UNCTAD (2017) claimed that Emerging countries are still the hottest prospect in the world for investors. From the prospective investment destination rank, it is stated that emerging markets still the hottest target for investment in the near future beside the United States. From the prospective emerging countries ranks of top 15 countries to receive FDI in 2017-2019, at least 5 Countries included as the 13. Indonesia earned the fourth top prospective country below US, China, and India. It is the highest rank between SEA countries. Thailand earn the fifth spot with a same projection of FDI inflow. Philippines, Vietnam and Singapore were also listed as the top 10, 11, and 13 respectively. This list is clearly

confirming that not only SEA country's seeks FDI and prepare them to receive it, but foreign investors are also considered highly the vast development of emerging markets. It is clear that growth, economic development, employment absorption, and income growth are, above all, what they want to achieve; both the private and public sectors have this mutual consent and prospective condition of foreign investment. However, the generalization of inward investment would only foreclose the differences of impact from the characteristic of each sectors of FDI. In fact, the benefit or even the drawback of FDI has not evenly shared between countries and sectors (OECD, 2002). Therefore, it is important to note that testing FDI's impact should be decomposed into sectors. Moreover, in the wise of benefit, growth should not only the ultimate consideration as what concerning next is whether growth could be equal.

2.1.2 Income Inequality

In the world today, inequality has always been a problem globally. Different sectors have its own problem regarding inequality. In theory, inequality is divided into 2 perspective; social and economic inequality. In social perspective, inequality is compared between class, race, gender, and believes. While economic inequality commonly defined by income, wage, and consumption distribution.

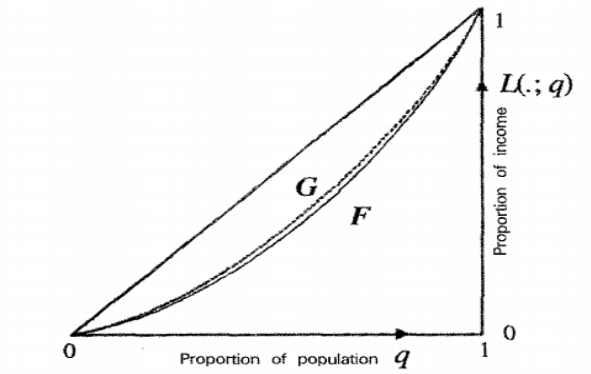
When it comes to income inequality, perspective of 'equal' varies. In economic egalitarianism, inequality concept is narrowed into equal distribution of money (Sen, 1997). However, other perspective argued that economical condition should be taken to account in judging the equality of money distribution among societies (Frankfurt, 1987). For instance, people with special needs, for example disable, are considered to need larger share of income to cope with daily life. Thus, in judging equal distribution of money, broader economical aspect should be taken to account rather than judging the equality solely by the amount of money distributed.

Income, in one hand, is obviously relates to other resources such as job availability and investment condition. On the other hand, income shall be seen as individual achievement and freedom. Those two perspectives does not went constant. Looking through these different variation of contingencies in converting income, there are at least five important variations (Sen, 1997). First is personal heterogeneities. It differentiates the value based on the individual characteristics. For instance, ill person should earned more in order to compensate their illness and do daily routines. Second is the environmental diversities; range of location could affect person out of a given level of income through the condition of the environment such as rainfall, floods, seawater level, etc. The third variation is social climate; it influenced the conversion of income through the condition of public health service, educational institutions, and violence rate. Fourth is the difference in rational perspective. Poorer household might live surrounded by the richer neighborhoods. This case could cause the person problematic to take part in the life of the community. Although this poorer household's income might be significantly higher comparing to the income at which other poorer communities could afford with ease. This variation is more into inter-societal, rather than inter-individual. The fifth variation is distribution within the family. When income of one member in a family comes dependently from the family income, then the individuals

Income inequality is defined with several approaches. In theory, kuznet curves became one of the first movers in defining income inequality. It framed an exogenous growth process and its implication on inequality (Barro, 1999). It represent the stage where income inequality arise, which followed by a downfall at the later stage. As explained by Milanovic (2000), the hypothesis of kuznet stated that at the beginning income inequality relatively low as people share the same productivity power given the condition that everybody live near the subsistence level. When growth slowly arise, the behavior and distribution of power slowly to be more centered; growth leads people migrate from rural to more urbanized area which create potential raise in income differentiation. Should that be a trend then the urban grow will grow faster than rural area. Thus, it could be consequent in leaving the rural society behind in income distribution (Milanovic, 2000).

Some other approach introduced in measuring and describe inequality, such as the Atkinson approach, in which creating a link between welfare function with the concept of the equally distributed equivalent level of income (Creedy, 1996). In more modern approach, Gini coefficient is used much around the world. In fact, it was stated as the most commonly used to measure inequality (Gilbert, 2000). Gini coefficient is derived according to Lorenz curve which is plotting an aggregate income share relative to aggregate population share (Deininger and Squire, 1996). Thus, it explained the gap between the perfect equality line (commonly called the 45 degree line) and the Lorenz curve. As shown in Figure 3 below, the x axis indicates population aggregate while y-axis shows income proportion. The straight line indicates perfect distribution. Lorenz curve indicated from the curve line. The unbalance proportion between the aggregate of population and income will only derived the line to curvier. These space created by the curve is gini coefficient (G) (cowell 2000).

Figure 3: Lorenz curve of income inequality



Source: Cowell, 2000, p. 105.

The widely usage of gini coefficient is perhaps mainly because of its simplicity. Gini coefficient interprets inequality between the top and the bottom tail of distribution through the scale of 0 to 1. Where the lowest value equals to zero inequality and the highest value indicates perfect inequality. Currently, the data of inequality is widely posted as gini index which derived from gini coefficient multiplied by 10. Thus gini index interpret inequality from 0 to 100. However, gini is not without weaknesses. One major concern is their incapability of responding the redistribution activity between population in the opposite tails of the distribution,

which might affect the inequality level (Alfonso, Lafleur, and Alarcon, 2015). Gini could also not interpret various inequalities. Thus gini would still have the same value regardless of Lorenz curve different intersection and pattern (De Maio, 2007)

However, gini remained popular in inequality measurement due to its advantages. gini index is known for its high independence level of measurement. It set asides external characteristic of a specific population such as GDP, security level, and country area. Thus it is a strong method for comparison between population or country regardless of the sizes (Alfonso *et al,* 2007). This independence level and anonymity behavior is a good fit to be used for this study. First, it keeps the comparison of inequality between countries remain robust since gini only measure the aggregation of population and income. Secondly, this study use panel data to describe trend and affection from time to time and, on that accordance, gini would provide a reliable source.

2.1.3 FDI and Income Inequality: The Capability Approach

Various researches about the linkage of FDI and income inequality showed the significance. However, the characteristic of the effect are various. According to Basu and Guariglia (2007), FDI leads to higher disparity between the poor and the rich. This statement is supported by the findings from Kuncera and Roncolato (2011). Using the Gini index as the income inequality measurement, they concluded that gini coefficient increases when the inward FDI increase. Another finding differentiates the scope to developing and developed country in which have different conclusions. In developed countries, income inequality decreases with the increase of inward stock, while in developing countries FDI tend to increase the income inequality (Figini and Gord, 2006).

Divided results on the effect of FDI and income inequality are not only about the behavior of the effect but also the significance level. According to Reuveny and Li (2003) FDI is one of the economic openness categories that has nonlinear relationship with income inequality. It was also supported by Faustino and Vali (2011), suggested that the relationship of FDI and income inequality is not significant, especially in less developed countries (Faustino and Villa, 2011). Thus, in order to explain deeper causality of the two variables, mediating factors is used. Quoted from Baron and Kenny (1986), mediating factor play role in "representing the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest (Baron and Kenny, p.1176, 1986). Rather than specifying when effects will hold, mediating factors explained the 'why' and 'how' particular effect occurs. It speaks about how and to what extend does external variables intervened and explained the relationship of independent and dependent variable (Zhao, Lynch, and Chen, 2010).

On that regards, Sen (1992) delivered a strong argument that inequality and poverty can be explained through capability in which embodied in the capability approach. The basic idea would be that capability is needed in order to achieve certain 'functionings' that considered valuable. Functioning defined as a state of 'being' or 'doing' such as 'being adequate' and 'being nourished'. In individual level, it determined as an achievement - it refers to people's 'do' and 'are' according to their

values of what they want to be. Capabilities, on the other hand, are the opportunity and freedom in order to achieve certain set of functionings.

Sen (1980) proposed the approach in order to argue the utilitarian approach, especially when it comes to equality and welfare. Utility-based is often pointing out only singular value for the effect of certain function. For example, happiness is the ultimate value in determining happiness. Sen suggest broaden point of view; he argued that 'being happy' is just one of many state the relevant in determining wellbeing. In fact, the argument is supported by Sugden (1993) claiming that utility is simply a subjective representation of individual's choice. He furthermore argued that "If a person's choosing x rather than y is not evidence that x possesses any particular qualities in relation to y, how can it provide any grounds for attributing greater social value to x than y?" (Sugden, 1993, p. 1950). Capability approach encourages the shift of thought from achieved functioning to capabilities. Quoted from Alkire (2005) stating an analogy that "*a person who is fasting is in a state of under-nutrition, which may seem very similar to a person who is starving. But in the one case, the fasting person could eat and chooses not to; whereas the starving person would eat if she could*." (Alkire, 2005, P.2). Based on that analogy, if the judgment start from the state of starvation, then the ideal solution is to give both of them food, while that should not be the case as one of them still have the ability to gain food even though they are at the same condition. Capability approach fills this gap with the urge to distribute an even opportunity and freedom which used to achieve function.

Capability approach seemed to have a strong argument why capability shall be the main focus in creating state of achievement. Then the next argument will be how (who or when) is to decide which capabilities matters. Both Sen and Nussbaum as the pioneers in this framework had different perspective about this (Oosterlaken, 2009). Nussbaum came up with a list of universal –as she believed- 10 important capabilities. She argued that it was a basis of constitutional thoughts which also accepting any adjustment or specification from different history and tradition in different countries (Nussbaum, 2007). Sen, on the other hand, choose to refuse endorsement of a set list of capabilities arguing that it depends on purpose and context and should be a result of public reasoning and democracy rather than a compiled set of a theory.

Both experts may have different thoughts on list of capabilities. But according to Robeyns (2006) Nussbaum's notion on list of human capabilities concern more on people's skills and personality traits. Robeyns (2000) on her other literatures reminded the 3 important points in operating capability approach. First is to see it as a framework of thought. Second, it is a critique on other approaches of welfare evaluation (i.e utilitarian). Third is the formula to make interpersonal comparisons of welfare (Robeyns, 2000). These points reflected much on what Sen tried to deliver from the beginning. In fact, he himself let this approach kept in abstract without specifying it into a specific scope, case and dimensions of research. As long as the aim is to achieve a specific state of being then capability approach framework would arguably the most suitable to be conducted.

With this unspecified scope and methodology, then to what extend does capability approach can be operationalized? The debate is still going on. However, capability approach in many times has been used in individual level as it mainly

focused on human capability sets. But this fact does not automatically make capability approach implied only in individual level. If it does, it will only harm the first basic point of capability approach that it should be kept as a free framework of thought. As a matter of fact, Comin (2001) on his analysis on the operationalization of capability approach notes that Sen, himself, several times used country-level data for some cases and research such as the assessment of performance from different groups and gender (Sen, 1985) and the comparison of poverty in using capability and income approach (Comin 2001; Sen 1992; Sen 1985).

In more recent situation, the framework of capability approach had been used to derive a country-level indicator of Human Development Index (HDI). An indicator first established in 1990 by the United Nation Development program (UNDP). It indicates level of human development in country level through three key dimensions of human capabilities of life longevity, knowledgeable, and decent living standard. UNDP as publisher argued that this dimensions, which derived from Sen's human capability, are important to be satisfied in order to achieve sustained human development. It furthermore argued that this indicator shall enhance the important of human's capability set to be considered as an important element for country's development and policy making (UNDP, 1990). The making and acceptance of this index, particularly an approval from Sen, provide further evidence that capability approach is suitable for a country level research.

Capability approach has indeed been used in country level with various topic of functioning. It also commonly used in inequality-related issues. Therefore, there is no reason to see the ineligibility of capability approach to be adopted for this research. As a matter of fact the dimensions of HDI would also be considered as one of the capability set in this case. However, the writer realizes that in terms of country, human would not the only perspective that should be delivered. After all, capability approach itself promotes a larger scope to be considered rather than pin-pointing one element as an ultimate predictor of state of being. Previous sections in this research mentioned the importance of other stakeholders when considering list of country's capability. Hence, this study adopts three key capabilities of country, namely human, infrastructure and government capability. The importance of inclusion of these three variables is explained separately in sub sections below.

2.1.3.1 Human capability

Human capability commonly refers to "human development approach" which derived from the development of the 'capability approach' concept (Nussbaum, 2007). The concept has been developed by both Amartya Sen and Martha Nussbaum, along with other recent scholars, which now embodied in the Human development reports by the United Nation since 1990. It reflects human basic capabilities to achieve state of well-being.

In country level, humans are considered as a resource. It is one of the factors of production (labor) as their degree is essential in productions. However, resource without exploitations does not have any means. As capability approach warns that production itself is a state of being (function), not the capability to achieve. Thus, human without capability shall not meet the requirement to produce. In fact, Sen emphasized that poverty and inequality is caused by lack of human capabilities (Cosbey, 2004).

Sen (1979) in explaining the concept of economic inequality has used three basic capabilities which consist of life expectancy, education, and income. A fulfillment in those three aspects for each individual would result in potential reduction of inequality. Education particularly, seen as an endowment process. It builds skills not only to gain wealth but to also achieve well-being (Lanzi, 2007). Based on this perspective, the concept of human capability will be represented by the human development as a variable which consist of Sen's Idea of basic capabilities as an indicator: longevity, education, and income.

2.1.3.2 Infrastructure capability

In country level, infrastructure is foundation of activities in an area. It is the one that connecting places and people at the first place. Infrastructure as a whole is largely associated with facility, structure, and system. But the capability of it must aim to enabling stakeholders in delivering missions and produce output effectively (Macmillan, 2016). Simply said, infrastructure is a set of facilities for all stakeholders with any kind of activities, including investment. According to Kinoshita and Lu (2011), an adequate infrastructure is an important determinant of FDI, especially in testing the nonlinear linkage between FDI and inequality. The presence of infrastructure is multi-dimensional. Various studies have decomposed the dimension of infrastructure into three dimensions, namely air infrastructure, electricity, and telephone structure (Zhang *et al*, 2010). With those indicators, Calderon and Serven (2004) also found that infrastructure proved to be a crucial determinant in creating attraction of FDI. The sufficiency of infrastructure found to be the way of cost reduction for MNEs and, thus, increasing rate of return.

Wu and Hsu (2012) included the indicators of infrastructure capability as a threshold variable in determining the relationship between FDI and income inequality. The result showed that in the case of less infrastructure ability to absorb, FDI has greater effect in raising inequality. On the other hand, area with more sophisticated infrastructure condition tends to have a small effect by FDI towards income distribution. They furthermore suggested the importance of infrastructure improvement as, in the long run, it will create more opportunities for the poor to catch up with the rich. As a matter of a fact, MNEs are attracted more to the area which has better absorptive capacity. Higher attraction for MNEs to allocate resources and production resulted in an increase of high skilled labor demand, in which creating higher income inequality.

Country's infrastructure is perhaps not the only significant in FDI attraction, but also play role in exploitation of FDI spillover. An adequate infrastructure enables local firms to enhance imitation, labor mobility, export, and raising competition. In other words, infrastructure is the supporting system while the previous four channels of production is the resources that should be exploit by the capability or opportunity (Gorg and Greenaway, 2004)

2.1.3.3 Government capabilities

Most of the time, government has an important position in every activities inside a country. Government is indeed widely seen as an ultimate part in facilitating a wealth creation, which consists of various stakeholders. Thus, their capabilities are always been a delicate issue. Government capabilities refer to their ability to facilitate

and satisfy stakeholders in terms of effective policy implementation which shown trough high transparency and accountability level (Crawford and Helm, 2009). The ability to provide transparency is increasing in demand over the years. According to Piotrowski and Van Ryzin (2007), there are two dimensions of government transparency. First is the demand towards technical implications and data such as public finance and safety. The second one is the perspective of the society itself of good and honest government. It is further suggested that transparency demand is dependent on societies perceived of openness degree. On one hand, public with notion of adequate openness government rather have low transparency demand. On the other hand, those who judged government has low openness tend to demand higher transparency (Piotroski and Van Ryzin, 2007).

The public demand is not without reason. In fact, a high government capability in creating sufficient transparency is significantly leads to positive credit market development (Becerra, Cavallo, and Scartascini, 2012). Moreover, government also plays a crucial role to investment condition, especially foreign direct investment, for two main reasons (Bloningen, 2005). First is regarding the legal protection of asset. A poor system in this aspect shall increase the chance of expropriation of a firm's asset making which leads to possible reduction foreign investment. Second, it was found that corruption within the government could increase the cost of doing business which consequent in diminishing FDI activity. Furthermore, a well –developed government has a significant negative influence towards investment volatility. Thus, leads to less –risk environment to the country (Buchanan, Le, and Rishi, 2011)

Government can also be seen as a two sided blade; It could serve as a benefit to ease of doing business or it possibly serve as a cost (Masron and Abdulldah, 2010). Government was found inevitable in determining both FDI attraction and benefits. Interestingly, in investment perspective, it was found that when host country institutional development is well enough it does not only enhance the positive impact of FDI for the society but also diminishing the negative one, in this case it was employment reduction and pollutions (Wang *et al,* 2012).

Another finding found that testing the relationship between FDI alone to the economic growth, it did not show any significant effect. When government quality takes part of mediation, FDI shall enhance the positive effect to it (Jude and Leviegue, 2015). They furthermore argued that, in particular, bureaucracy quality, democratic accountability military in politics and ethnical tensions stimulate a gradual increase in FDI. Thus, institutional framework shall be the priority before engaging in policies regarding FDI attraction.

Government capability is not only impacting FDI but could also determine the income inequality. However, the impact was different between rich and poor countries. Government quality in poorer country tends to have a positive influence towards inequality. On the other hand, government quality of richer country is positive towards more equal income distribution (Cong and Calderon, 2000). This trend happened possibly due to the fact that, commonly, institutional reform, such as improvement of tax collection, higher standard of bureaucrat training, and corruption reduction, charge a rather high initial transaction cost, in which possibly felt by the lower economy group, especially the informal sector. In developing countries,

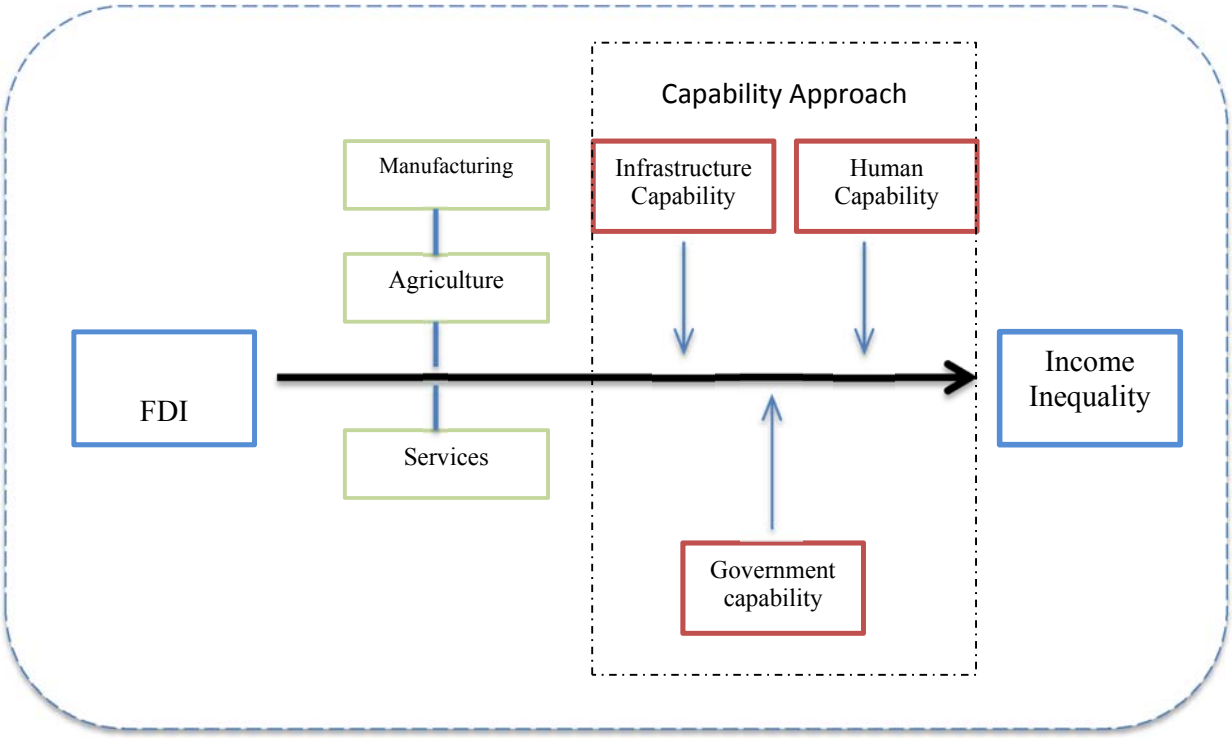
underground or informal sector usually representing a large sector within the population. New restrictions, procedure, and official norms could easily affect the system in which the informal sector carries their transactions.

2.2 Conceptual framework

The research takes place in testing and explaining the relationship between Foreign Direct Investment as an independent variable and income inequality as dependent variable. In this case, income inequality will be measured using Gini coefficient.

The causal relationship between FDI and income inequality has been tested from past studies with various mediating concepts. In this research, the main idea of capability approach will be brought into county level to explain the relationship between FDI and income inequality. The four main capabilities are: human capability, infrastructure capability, and government capability.

Figure 4: Conceptual Framework



Source: Author, 2017.

Human capability refers to human development which concern with the basic capability of human. Many scholars, especially in economic integration and FDI related, mentioned human as a 'capital' which put focus only in their educational performance. With the capability approach concept, human will be viewed as a country's capability to gain benefits of FDI and also the subject of income distribution. It indicated through life expectancy, education, and income (human development index indicators). Infrastructure capability is also a famous country ability to convert spillover into benefits. It also confirmed related to growth.

Government capability should also explain country's capability in facilitating the wealth creation and decision maker on country's development. It mainly described governmental performance. Most of the case, it was indicated through corruption and transparency level. In this research, education expense shall also be included to strengthen the ability of the variable to explain the relationship between FDI and income inequality.

Chapter 3: Research Design and Methods

3.1 Revised Research Questions

Main research question:

What is the impact of inward foreign direct investment towards income inequality in Southeast Asia from 2003 to 2012?

Sub questions:

- What does the impact of FDI towards income inequality in each FDI sector?
- To what extend does the capability approach explain the impact of FDI towards income inequality?
- What are the significant factors that affecting FDI to reduce income inequality?

3.2 Research Strategy and Methodology

The research shall explain the impact of independent variable (IV) to dependent variable (DV) and shall also describe which mediating variables are affecting the relationship. Accordingly, analysis should be done through existing data as testing impact can only be derived from past activities. Therefore, desk research is the most suitable strategy as it main approach is using existing data sources for a study (Theil, 2007).

Desk research arguably the most common and suitable strategy for existing data usage, and in this case, secondary analysis will be the type of research methodology. As a note, all data that will be analyzed are collected by other party and had been used by another for more extensive research. Therefore, this research reuses the existed data for different aims and scope of extensive research. Secondary analysis is also suitable for a deductive research; which exactly what this research do. It is a theory-based research in testing and explaining the causality of FDI and income inequality relationship. It also aimed to do a comparative analysis through comparing the relationship across ASEAN nations. In using statistical data and testing relationship, the research hold a compilation of various existed data in which combined to be presented as a particular variable.

As the main theme is to explain the relationship of FDI and income inequality, a regression analysis will be operated. In the first level, panel regression will take place in testing the relationship of FDI and income inequality. The regression will be done for three major sectors of FDI; service, manufacturing, and agriculture. In second level, panel regression with interaction from country's capability will be operated in order to increase the robustness of the relationship between FDI and income inequality. The interaction includes human, infrastructure, Government capability. This stage of test is to further analyze to what extent country's capability determines the relationship of FDI and income inequality. It includes the interaction from the index value of human, infrastructure, and government capability. These index values will be deployed both separately and wholly in one model with the aim of comparing results in different scenario. The final stage of regression test is also using interaction term but this time, the mediation variable is each proxy from all three capabilities. However, all nine proxies from three capability variables are unable to be tested in one model. Thus, in this stage, the comparison between all FDI sectors and income inequality is separated by each capability.

The strategy of using proxies, data reduction technique from country-level value, and deployed in panel regression shall have pass several assumption tests, which is also been done in this study. The majority of statistical assumption test results are satisfying (see subsection 3.5 for details). However, it does not mean this strategy is perfection. The adoption of capability approach into country level itself could raise an argument. After all, capability approach was commonly used in micro perspective which focuses on human's capability set. It is a strong approach to determine and differentiate set of skills needed in order to achieve the state of being. However, since country is the subject in this study, it indeed loosing loads amount of details which what has been the strength in other studies that use capability approach. All proxies used here is an aggregate through specific measurement by the publisher which commonly does not differentiate between country's characteristics – and so does this research. Hence, it will only cover the relationship testing between FDI and income inequality with values from country's capabilities as the mediation term. In other words, Comparison between countries is solely dependent from these proxies.

With these limitations, it is also important to note the strengths of this strategy. Using proxies from country capability is also not out of context. As mentioned in previous sections, county-level data has been used even by the capability approach pioneers like Amartya Sen. With does not solely take away all the details that can be absorb. In fact, the strategy of breaking down the empirical analysis into three sections is to provide an arguable depth of the research question. With an ideal assumption test result, this study provides different scale of result. It presents results from a straight-forward test of FDI-income inequality nexus down to the result of each FDI sector with each of capability indicators. Thus, this strategy is suitable fro answering the research questions. After all, this is the most simple, less cost and time spent to conduct which match with the time period provided to conduct this research.

3.3 Operationalization

The concepts that were explained in chapter 2 are unbundled into variables and indicators. Each tables present independent, dependent, mediating, and control variables separately, which presented as follows:

Table 1: Independent Variable

Concept	Variable	Indicator	Source	Value
Global Economic Integration	FDI	Sectoral greenfield FDI inflow as a% of GDP	FDI markets	Higher FDI inflow leads to higher economic integration

Table 2: Dependent Variable

Concept	Variable	Indicator	Source	Value
Income Inequality	Income Distribution	Gini Coefficient	EuroMonitor Passport	Higher result shows higher inequality

Table 3: Mediation Variables (Absorptive Capacity)

Concept	Variable	Indicator	Source	Value
Infrastructure capacity	Infrastructure	% of Households using mobile phones	World Bank	Higher % of households using mobile phones leads to better infrastructure
		% population using internet	World Bank	Higher % of internet usage leads to better line infrastructure
		Volume of freight, express mail, and diplomatic bags carried by air carriers registers in the country on each flight stage	World Bank	Larger volume of freight, mail, and bags carried indicates better air infrastructure

Table 4: Mediation Variables (Human Capability)

Concept	Variable	Indicator	Source	Value
Human capability	Human Development	Life expectancy at birth	Human Development Report (UNDP)	Higher life expectation leads to higher human capability
		Enrollment in tertiary education (%)	World economic forum	Higher enrollment % leads to higher human capability
		GNI per capita	World Bank	Higher result shows better human capability

Table 5: Mediation variables (Government Capability)

Concept	Variable	Indicator	Source	Value
Government Capability	Government quality	Education expenditure in a % of GDP	World Bank	Higher result shows better government quality
		Corruptions perception index	Transparency International	Higher result shows better government quality

Table 6: Control Variables

Variable	Indicator	Source
Trade	Share of exports and import (GDP %)	oxford economics
Initial per capita GDP growth	annual growth rate per capita GDP year 2006	Euro Monitor Passport
Initial Gini Coefficient	Gini coefficient value year 2006	Euro Monitor Passport
Size of the country	Land are (Square kilometer)	Food and Agriculture Organization
Population	total population	Euro Monitor Passport

3.4 Data Collection Method

As explained previously that secondary data analysis will take place. Data were collected from several organizations which described below:

- **World Development Indicators, World Bank**: Data collection for access to bank credit and market capitalization of listed companies (Financial capability), education expenditure in a %of GDP (Institutional capability), GNI per capita (human capability), Percentage of households using internet/mobile phone/ access to electronics, volume of express mail/diplomatic bags/ freight in a registered air carriers, and electricity productions (absorptive capacity).
- **Euro Monitor Passport**: A global market research database which specialized in consumers, economies and industries statistical data. It provides data for annual growth rate per capita GDP (2006), total population, 1st and 10th decile of income growth (Income inequality)
- **Oxford Economics:** One of the largest database resources. Provide global forecast and quantitative data for private and public institutions. This research collected data for gini coefficient (income inequality), and share of imports and exports.
- **World Economic forum:** a non-profit organization focusing on public-private cooperation. Data collected for transparency in policy making (institutional capabilities) and enrollment in tertiary education (human capability).
- **United Nation for Development Program:** International organization specializing in poverty and inequality reduction. Annually reporting human development index which used for data collection in life expectancy at birth (human capability).
- **Transparency International:** a non-governmental organization that focus on corruption eradication and transparency. Data collection was for corruption perception index (institutional capability)
- **Food and agriculture organization:** One of the agents of UN in fighting against hunger. Provide database in poverty related including land area which used in this research.

3.5 Data Analysis Method

From all data that gathered from various credible publishers, two types of analysis are deployed. First is the descriptive analysis. It mainly described data from each variables that done through trends and values. Several descriptive tools has also been deployed such as bar graph and thematic maps to visualize the trends and changes over time as the data collected is in a form of panel.

Second analysis is the inferential. It analyzed and described relationship between variables through the linearity level and coefficient sign and value. It consists of three stages and statistical regression. First is the regression of independent towards dependent variable. Second stage includes the moderating variable which in the first level, it derived from the indexed value of each of the mediating variables. The second level includes all the indicators from each variable to be the mediating

variables. The analysis from mediating variables is done through panel regression with interactions. Further detailed elaborations of these two types of analysis are done below.

3.5.1 Descriptive Analysis

This type of analysis is suitable to study on characteristics of the variables in the data set and explaining the existing relations between those variables, which commonly use the ordinal and nominal data (Thiel, 2007). In this study, descriptive analysis used to describe short term (a decade) trends of dependent, independent and mediating variables, since all indicators are panel data. Furthermore, the trend description also includes comparison and rank between countries.

The dependent variable is described through gini index data from Euro monitor Passport and World Income Inequality Database (WIIB). The index is range from 0 to 100 percent. The lowest score (0) represent perfect distribution of income while 1 means perfect inequality. On the other hand, the independent variable is described through three sectors of inward Greenfield FDI value. All three sectors (agriculture, manufacturing, service) are described separately which also include comparison and rank between countries. The mediating variables will also be described through trend and compares it between countries. Describing country's capabilities in this section is through the indexed value of human, infrastructure, and government capability. After all, these three values is a reduction from all indicators from each of the capability variables. The reduction process is done through principle component Analysis (PCA) which further described below.

The descriptive analysis in this study includes several aspects such as trend description, country comparisons, rank, and data indexing. Thus, before interpreting the analysis there some computation that should be done which is described as follows:

- **Bar Graphs:** it is a straight-forward method to show the comparison of values between countries in years. In this case, bar graph used to show three FDI sectors, gini, and all three capabilities. The visualization, which present in bar-shaped graphic, captured all 10 years performance of each countries. Thus, making a clear comparison between time and country.
- **Thematic Maps:** used to visualize the value of gini index and capabilities between countries. The visualization includes maps, and graduated color of each country. The color shows the value, which differences between low and high determined my change of color and gradients.
- **Principle Component:** this method used to combine all indicators of all indicators in each capability. With a data reduction process, the research can use three indexed values of human, infrastructure and government capabilities. The index value of human capability is a combination from life expectancy, GNI, and tertiary enrollment. Infrastructure capability index value comes from mobile subscriptions, internet usage, and freight volume. Government capability has its index values from corruption index and education expenses in a percentage of GDP. Therefore, those three index values cover all indicators available.

Principle Component Analysis (PCA) is a data reduction and technique aimed to simplify the analysis of a complex and highly related dataset (Sainai, 2014). Using

PCA, the reduction of various predictors can be into 1 or more components, depending on the desired needs. In this case, indicators from each capability were indexed into three variable of human, infrastructure and government. This reduction technique has to pass two steps of assumption test. First is the data explanation (varimax). Each indicators that combined into index shall be seen its explanation percentage. A strong index data should have more than 50% of data explanation from each indicator. The second test is sampling adequacy through Kaiser-meyer-Olkin (KMO) test. A weak sample has a KMO score of 0.4 or below, while a strongly adequate sample should have KMO score of minimum 0.7.

In this research, all indicators from three index values are explained more than 50%. Thus, from this perspective the index value have a strong position to be presented. The KMO however have an ideal and rather not so strong value. Indicators from human and infrastructure capability have KMO score above 0.65. However, government capability indicators only appear in 0.5 It may not the strong value even though also not the weakest. Yet, it will still be used in descriptive and inferential analysis as the presence of this value is essential in to answer the research question. After all, none of them are below 0.4. A further arguments and explanations regarding data reduction test is explained in more detail in the chapter 4 of inferential analysis.

3.5.2 Inferential Analysis

A statistical analysis applied to test the systematic relation between two variables (Thiel, 2007). In this purpose, test applied to determine the linearity of relations between FDI and income inequality. In order to operate the data, the research used two level of regression. First is the panel regression. The aim of this operation is to determine the causal relationship between FDI and income inequality. In this stage, FDI will be unbundled into three major sectors and tested separately to the relation of income inequality with the presence of initial gini, GDP, total trades, and population for control variables.

In second stage, panel regression with interaction terms is deployed to analyze the effect of FDI to gini when capability index is included. Each sectors of FDI will be tested separately to gini along with their interaction with three country's capability. This stage of analysis is to prove and improve previous studies, which also mentioned by Sylwester (2005), that FDI has a non-linear relationship with income inequality. It is also confirmed by Wu and Hsu (2012), which furthermore stating that the relationship between FDI and income inequality host country's capabilities (Wu and Hsu, 2012).

With a limitation of index value in the second stage, the third stage of panel regression with interaction is deployed. In this stage, the interaction terms that used is the original indicators from each of capability variables. It provides further answers on the factors that determine the relationship of FDI and income inequality. These answers would not be found in pervious stage with an index value of variable,

In order to deploy panel regression, the data set must first pass several assumption tests. The tests include linearity, multicollinearity, model specification, and autocorrelation, which passing each of them confirming the robustness and reliability of the dataset. The tests are individually explained as follows:

- **Linearity:** shows the linearity between independent and dependent variables. The analysis is only through line graphic (showed in chapter 4). Low linearity between independent and dependent variables leads to lower robustness of the test. There are several ways to improve the linearity of variables. The data could be generated into log or square root - depends which one appears to be more linear. Thus, some data in this study are generated into log and square root in order to be highly linear with the outcome variable (gini).
- **Multicollinearity:** this test shows the linearity level among independent variables. The test also includes all of the mediating variables. To pass the test, linearity between variables should be lower than 10. Value above the threshold shall be considered highly linear with another and one of them should be dropped.
- **Homoscedasticity:** One major concern of robust dataset to be regressed is that the residuals shall be homoscedastic. This test able to indicate whether the data homoscedastic or heteroscedastic. A significant value of Chi-square indicates heteroscedastic data. If so, *robust* command shall be included in regression to transformed data to be homoscedastic.
- **Model Specification:** This test defines the compatibility of the model. The test use Omitted Variable test (ovtest) which shows if variables are omitted. A significant value of F indicate that the model is not fit enough to be regressed. In that case, changes should be made for either the whole model or the dataset.
- **Independence:** This test assumed that the errors associated with one observation are not correlated with the errors of any other observation. To pass the test, the result must show no first order correlation which associated with significant value of Chi-square.
- **Hausman test:** one of the statistical hypothesis tests to predict the level of model misspecification. That is, the consistency level of the independent residuals comparing to other alternatives. In panel dataset analysis, Hausman test provide assessment on which one of the two computation techniques in final regression. The two techniques include fixed and random effect. The null hypothesis (above 0.05) would be that conceptual framework is random effect. Thus, rejecting null hypothesis indicates that the model is fixed effect.

These assumption tests were deployed one by one for each conceptual model. For instance, the regression of FDI of gini index has separated assumption test result with when the capability approach's variables are included in the regression. This is due to a high multicollinearity between indicators from different variables. Thus, regression for all indicators, including the control variables, resulting in failed multicollinearity test (VIF) which affecting the model not fit and robust enough to be regressed. However, when the assumption test ran separately, the model is fit and robust enough to be regressed. Those assumption test results and argument are further explained in inferential analysis section of chapter 4.

3.6 Reliability and Validity

This research aimed to have a strong position in validity. One of the approaches is the data collection. All data were collected from a reputable official organization, such as World Bank, oxford economics, and world economic forum, which invent a large volume of database depending on each of their focus. The free access to some universities helps to judge the justification that they are worth on data

collection. In operation of statistical measurement, two steps of regression model will be used. It aimed to strengthen the robustness of the model.

Reliability in this type of research would be much about data usage. In fact, some data such as government expenditure on education as a % of GDP are missing in some year at some particular country. It might affect the reliability of the data. However, the assumption test that explained above of each proxy has been satisfying (result explained in section 4.2) which then can be concluded as having a reliable and robust data to be regressed. Data usage in presenting specific variable is also a concern for reliability. Therefore, in this research none of the indicators used is outside what has been used in previous researches. In fact, the indicators here are all based on previous findings from a similar topic of research. Moreover, the use of country as reference unit is also a valid approach to be operationalized. It reflects on previous research regarding capability approach which in practice, capability approach is not formally stated as an individual approach. It rather be a freedom of thought to achieve certain functioning.

Chapter 4: Research Findings

This chapter consists of two types of analysis which aims to provide answers and suggestions on the research questions. The result and analysis is provided based on the previously-mentioned research method and strategy. The first analysis is the descriptive analysis. It aims to describe trends and interpreting values from the county-level data with a visualization support from bar graph and thematic maps.

The second analysis, which based on panel regression with interaction terms, aims to provide analysis on the relationship of FDI and income inequality. Three stages of panel regression are deployed. First is the regression of each FDI sectors towards income inequality. Second analysis is based on the result of FDI and income inequality relationship with the presence of three country's capabilities indexed value as the mediating variable. The third stage provides further answer on factors or indicators that determine the relationship of FDI towards income inequality. In this section it also provides the results of any statistical assumption test that has been made for a robustness check. Further detailed results and elaboration is described below.

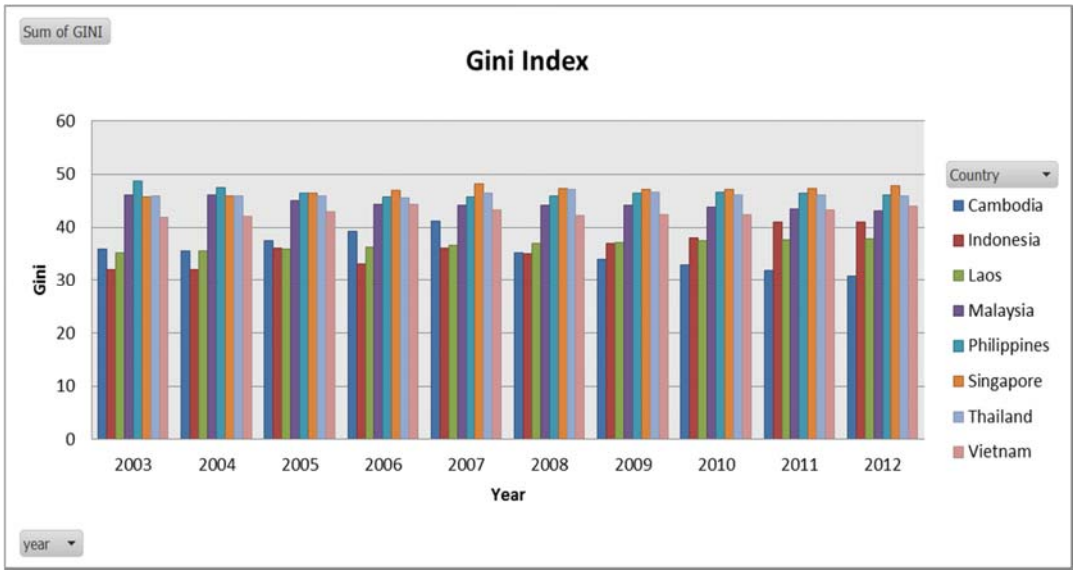
4.1 Descriptive Analysis

This section provides descriptive information about dependent variable (gini index), each sectors of FDI (agriculture, manufacturing, service), and the capability approach index. The analysis includes bar and line charts showing trends of each variables. Specifically in FDI section, it also include network graphic, which aimed to further show description and rank of investment source country.

4.1.1 Income Inequality (gini index)

Gini index, as shown in figure 5, shows the inequality level within a country. It starts from 0, which indicates perfect equality and 100 as a maximum where it indicates perfect inequality. In the time period of 2003 to 2012, the gini index of all 10 SEA countries was valued in the range of 30 to 50. The overall dynamics between countries were quite similar year by year. Most of the countries had low changes yearly. In deeper lenses, Cambodia arguably had the most dynamic gini index trend over the years. Unlike most other countries, Cambodia's gini index increase by 5.3 percent in 5 years from 35.8 in 2003 to 41.1 in 2007. It is the highest growth margin than any other countries. However, after 5 years of significant increase in income inequality, Cambodia were able to reduce their gini in the next 5 years; making them as the lowest income inequality compared to other SEA countries between 2009-2012.

Figure 5: Gini Index



Source: Author, from Euro Monitor Passport.

In a rank perspective, Philippines had the highest gini index early in 2003 and 2004. The rest of the years (2005-2012) were placed by Singapore; the smallest country but also considered the only developed SEA country. It is unfortunately interesting to accept the irony that the highest income inequality belongs to the most developed country. Moreover, at the bottom of the rank, it used to be Indonesia, which stood still six straight years until 2008. However, a significant increase in income distribution in 2009 makes Cambodia took over from Indonesia as the lowest income inequality country. The each following years until 2012, there was always an in increase in gap between Cambodia as the lowest income inequality country and the rest of the countries due to significant reduction of gini index of Cambodia in each year.

Figure 7: Gini Index of 8 SEA Countries (2003)

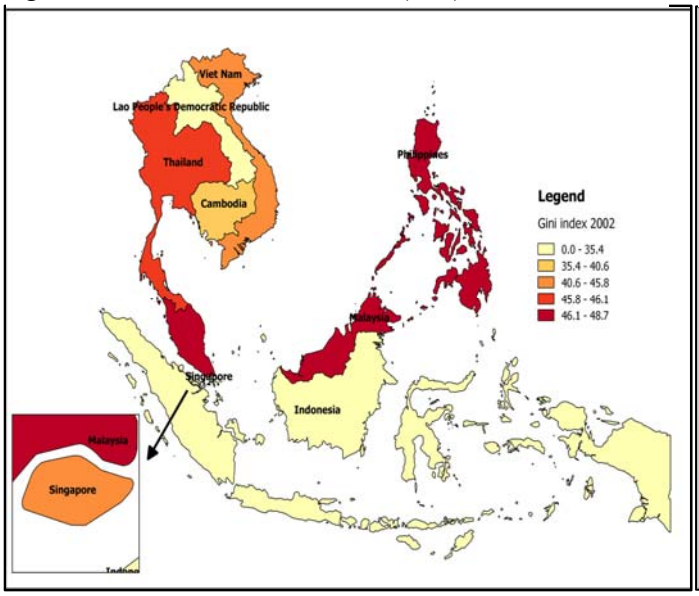
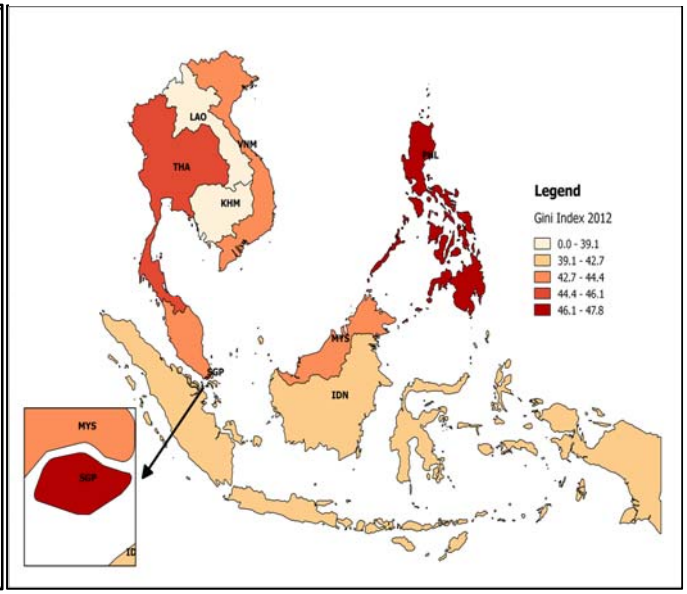


Figure 6: Gini Index of 8 SEA Countries (2012)



Source: Euro Monitor Passport, operated by author in QGIS, 2017.

Figure 6 and 7 above provide a visual map on a 10 years difference of gini index in 8 Southeast Asian countries in 2003 and 2012, respectively. From these maps, it can be seen clearly that in a decade most countries were quite stable even though there is a mix between country with a decreasing and increasing value. This stable movement is seen clearly from the slight different of gini index scale from 2003 and in 2012. The lowest value in 20003 is at 35.4, while the bottom rank in 2012 is at 39. From this lowest value, turns out Southeast Asia experience an overall increase in income inequality in the past 10 years, However, the highest value from 2003 with 48.7 was slightly decrease in 10 year times with 47.8 as the highest value. The highest value in 2003 was owned by Philippines. They then dropped only to 46 in 10 years' time. Hence, in 2012 the highest value of income inequality is owned by Singapore with 47.8.

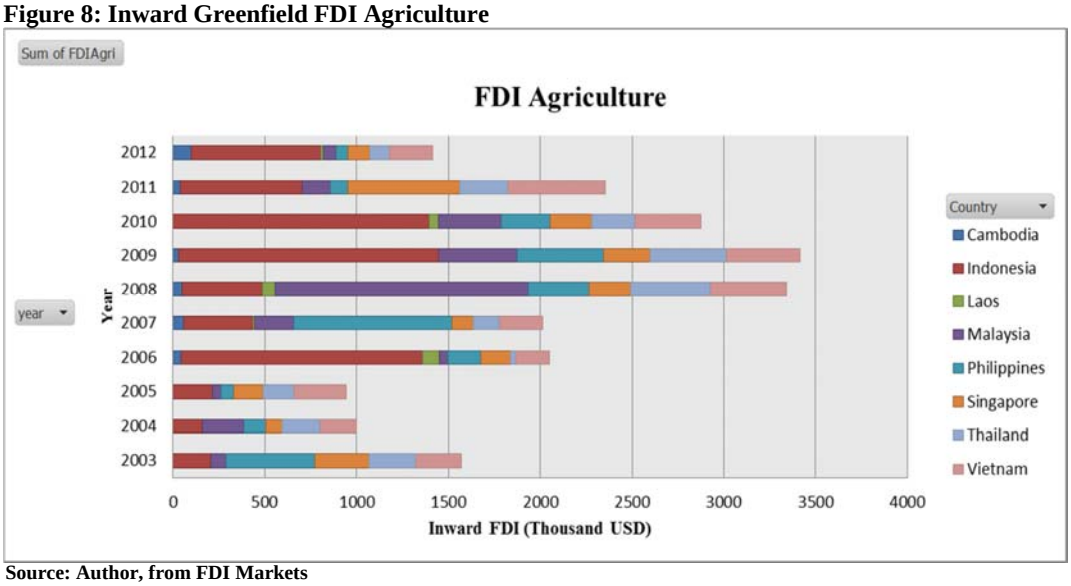
Indonesia arguably had the most significant increase of gini in a decade with a shift from below 35.4 in 2003 to above 39.1 in 2012. On the other hand, Cambodia experienced one of the most drastic decreases on inequality, at least compared to other countries. It went down from 35 in 2003 (orange color) to 30 in 2012 (white).

4.1.2 FDI Sectors

Descriptive analysis of FDI is separated into three sectors namely agriculture, manufacturing, and service. Each sector is explained in bar graph which shows trends and portion of countries from total inward Greenfield FDI. Further analysis is described below.

4.1.2.1 FDI Agriculture

Figure 8: Inward Greenfield FDI Agriculture



Source: Author, from FDI Markets

In figure 8, each bar shows the total inward FDI in agriculture sector of all 10 SEA countries annually. In regional perspective, the inward flows of FDI looks quite fluctuate. It stood slightly above 1.5 million USD in 2003 and dropped significantly to below a million USD in two years. However, after hitting the lowest point, FDI

inflow in agriculture drastically went up to above 2 million. Indonesia shares a big part of it with 1.3 million USD alone. The FDI inflow kept on increased until it reached the highest in 2009. Overall, the graph shows agriculture in SEA countries were growing and have possible sustainable performance due to the growing value of inward FDI. This perhaps obvious which in fact that SEA countries are well known with their tropical equatorial-located geography where agriculture production tends to be higher and more varieties. Thus, opportunity and market are large and worth enough to attract FDI.

On country level, FDI in agriculture seems dominated by Indonesia, Malaysia, and Philippines. Indonesia had the most fluctuate condition where in 2003 they only the third lowest between other SEA countries. But in 2006 Indonesia received more than 1.2 million USD while Vietnam, the second highest receiver, only reach 183 thousand USD. In 2007 Indonesia dropped drastically to only almost 400 thousand USD. However, Malaysia in that year reaching the highest value of FDI reaching more than 800 thousand USD. Philippines also got a huge value of FDI in 2008 with more than 1.3 million USD. Starting 2009, Indonesia took the pole position until 2012. On the other hand, Cambodia and Laos competing each other in the bottom rank. Moreover, Singapore is quite unique in this case. With the fact that Singapore owns the smallest land and ocean, it did not always dictate the performance of agriculture. In fact, their FDI inflow in agriculture was always above Cambodia and Laos. They even more beating Thailand, Vietnam, and Malaysia in 2011. However, it still can be concluded that FDI in agriculture attracted more to countries with large land area such as Indonesia, Malaysia, Philippines and Vietnam.

Figure 10: Inward Greenfield FDI Agriculture 2003 in ASEAN-8

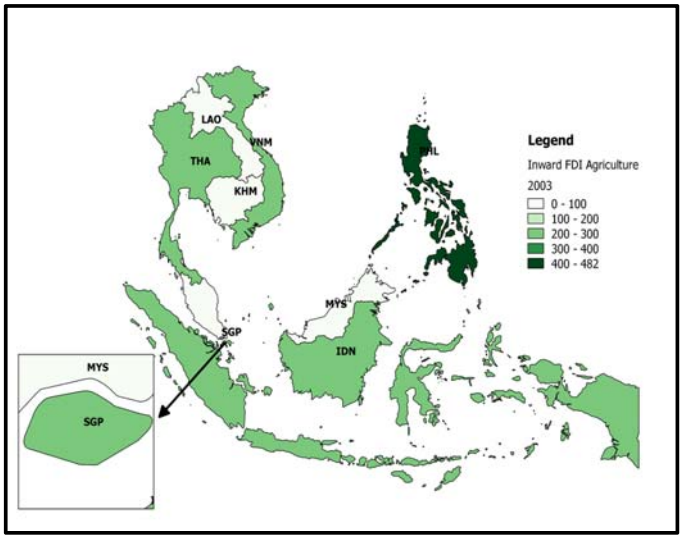
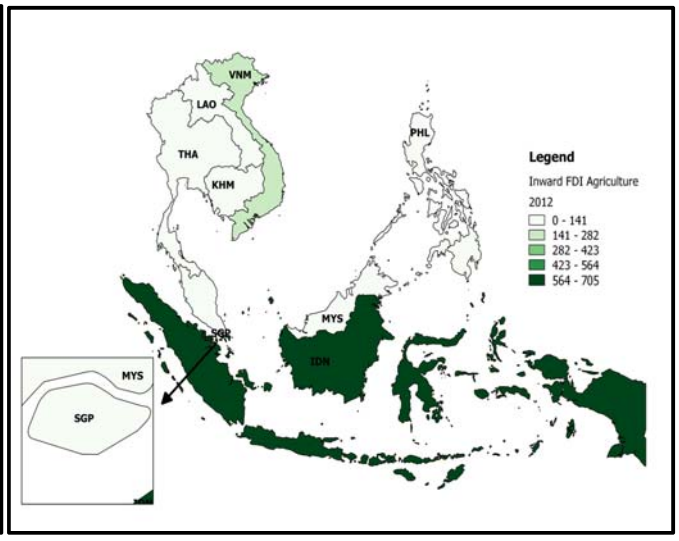


Figure 9: Inward Greenfield FDI Agriculture 2012 in ASEAN-8



Source: Author, 2017 operated in QGIS from FDI markets

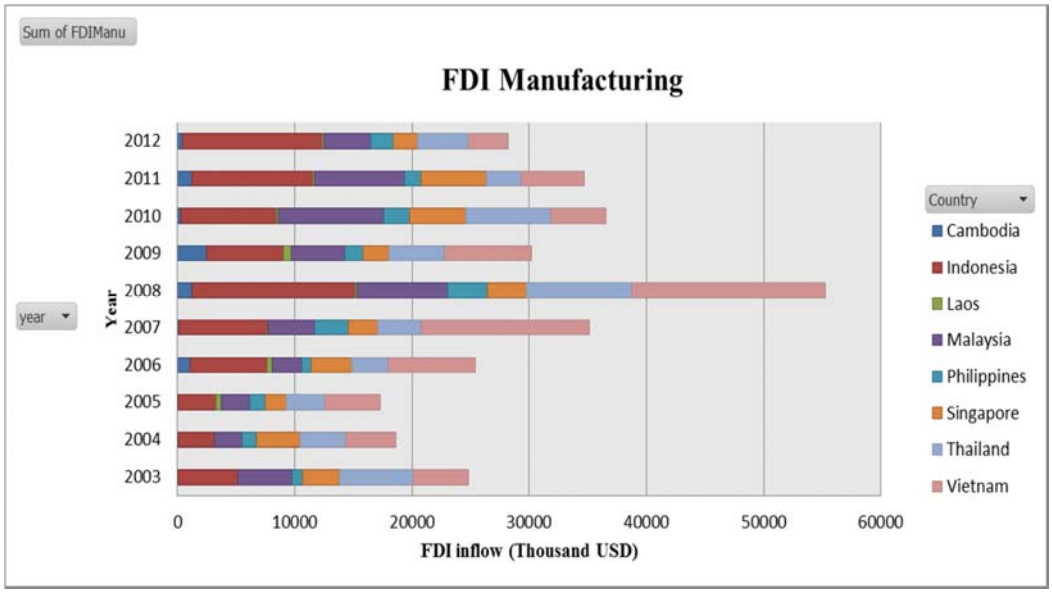
Figure 9 and 10 provides visualization on the 10 years' difference of inward Greenfield FDI agriculture. A greener color indicates higher inward FDI. From both figures, it was previously mentioned that in 2012 most of countries experienced a significant decrease on inward FDI agriculture which can be seen clearly in these figures. From the legend of the two figures suggest that the highest value segment experienced a high increase from 482 thousand USD (belongs to Philippines) to

above 700 thousand USD in 2012 that belongs to Indonesia. However, this significant increasing value is only applied to Indonesia. It is indeed the only ASEAN country that has an increase in value from the previous year.

The rest of the countries experienced a decrease of inward FDI agriculture value. Philippines is arguably had the most significant drop. From the highest country in receiving agriculture investment in 2003, they became one of the lowest to receive inward FDI agriculture. Vietnam, Thailand, and Singapore were also dropping in value. However, the trend that shows in figure 8 shows an increasing trend in the past 9 years. It seems that only in 2012 that most countries experienced a drop. Therefore, it might be a one year phenomena that dropping investment value in agriculture happened.

4.1.2.2 FDI Manufacturing

Figure 11: Inward Greenfield FDI Manufacturing



Source: Author, from FDI Markets

Figure 11 shows the value of inward FDI in manufacturing from 2003 to 2012. At first, SEA countries did not attract much to the manufacturing sectors. In 2003, Thailand received the highest inward FDI, totaling up to more than 6 million US Dollars (USD). That was the last time Thailand topped other countries. In year after, Thailand drastically dropped to less than 4 million USD. On the other hand, Cambodia and Indonesia had a significant rise. It started in 2006 where Vietnam increased sharply in FDI inwards, reaching up to almost 8 million USD, followed by Indonesia in almost 7.5 million USD. Vietnam and Indonesia attracted more and more FDI in years after and both reaching it peaks in 2008 with Vietnam received more than 16 million USD and Indonesia got almost 14 million USD. In the same year, Thailand and Malaysia also highly injected in FDI comparing to years before. In just a year, however, all the high investment dropped dramatically. Vietnam from reaching 16 million became less than 8 million USD in 2009. It only drops in years after. On the other hand Indonesia gradually increasing again after the drop in 2009. They gently increased in inward FDI until became the highest receiver among other countries in 2011and 2012.

Figure 12: Inward Greenfield FDI Manufacturing 2003 in ASEAN-8

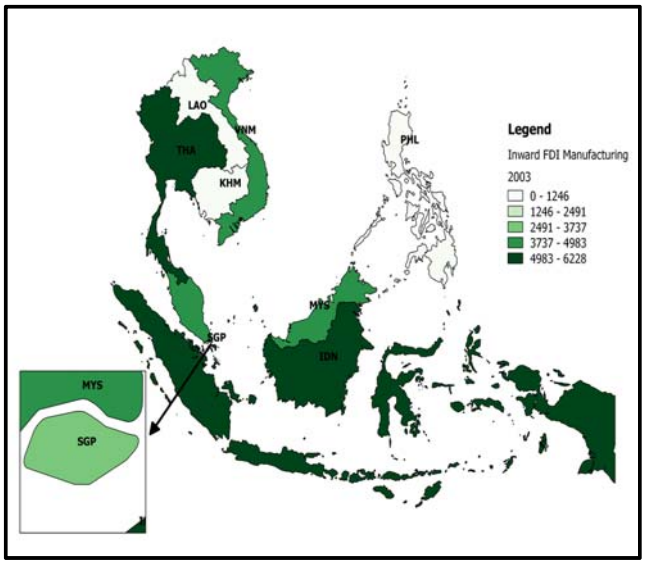
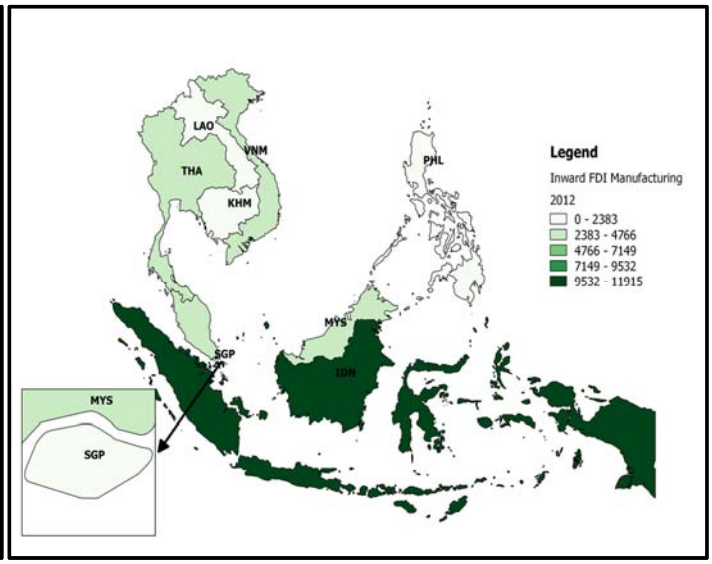


Figure 13: Inward Greenfield FDI Manufacturing 2012 in ASEAN-8



Source: Author, 2017 operated in QGIS from FDI markets

Figure 12 and 13 compares inward FDI in manufacturing sector of 2003 and 2012, respectively. The graduated green color from the two figures indicates a much different performance in 10 years' time. However, due to inability of specifying the two score segment, then we have to look specifically to the legend of both figures to analyze the differences. As can be seen, although in 2003 more countries have darker green color (indicating higher inward FDI) but the legend in figure 13 indicates a higher value segment for each of the color. Indeed, from both legends, the shift of value scale has much more higher in 2012. The highest value of inward manufacturing investment in 2012 is above 11 million USD whilst the maximum value of the darkest green color in 2003 only indicating up to 6.2 million USD of FDI in manufacturing.

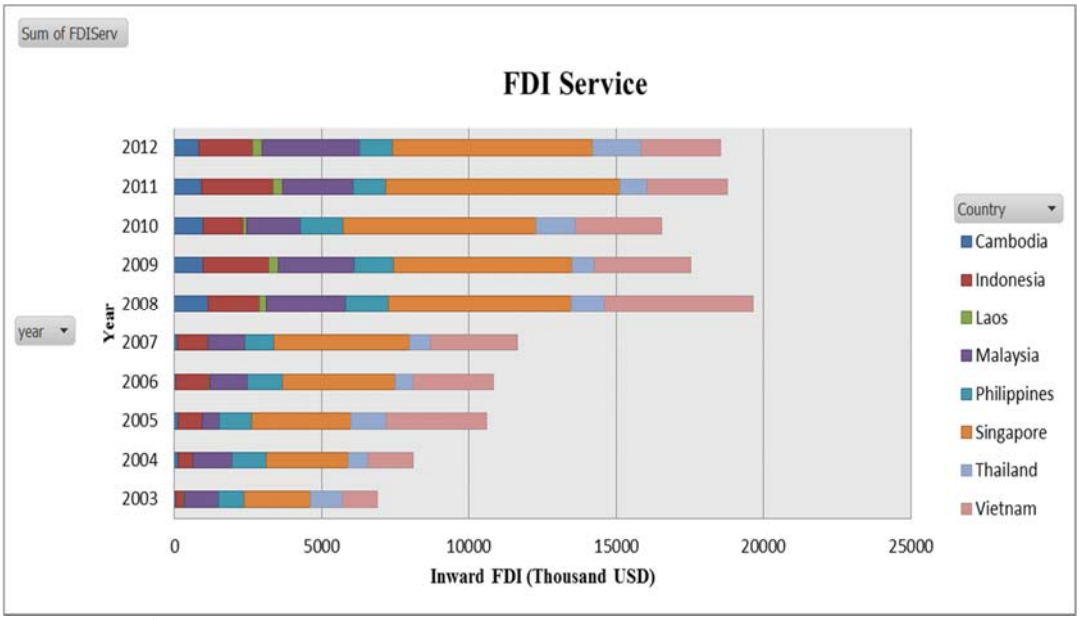
Laos, Philippines, and Cambodia are indeed having the same color of the lightest green. But the three of them experienced an increase of investment in 10 years' time. Laos went from only a thousand USD in 2003 to more than 16 thousand USD. However, that significant increase stills the lowest from other countries. Cambodia has also done likewise. They start with not more than 54 thousand USD of FDI to more than 400 thousand USD in 2012. Philippines also did not change in color but they still manage to increase the manufacturing FDI from 890 thousand USD in 2003 to more than 1.8 million USD. On the other hand, Indonesia managed to be in the highest segment of inward FDI value but, as mentioned, their increase of value is massive.

In conclusion, from this period of time it can be suggested that ASEAN countries is clearly seen as the attraction of foreign investors in manufacturing sector. Perhaps, with their human resource which in most countries were still developing attracted manufacturing companies to open factories and production center as these countries offers lower wages to be paid for hiring local people in those countries. Indeed, that would be one of the major factors of interest for foreign investors.

4.1.2.3 FDI Service

In service sectors, SEA countries gradually increased in attraction for FDI. In figure 14, it can be seen that in early 5 years (2003-2007) FDI inflow in service for the total of 8 countries was increasing every year. It hit the peak value in 2008 with almost 20 million USD. In years after, it was ups-and-downs every year. However, since 2008, the FDI value in service never went down under 15 million USD. In ten years of range, SEA countries experienced two stages; first is the growing phase in 2003-2007; second is mature phase in 2008-2009, where inward FDI in service seems moving only in the corridor of 15 to 20 million USD. Remembering most of the SEA countries are still developing and have huge market, it is understandable to believe on the possibility that FDI in service will grow even higher in the more recent years or maybe future.

Figure 14: Inward Greenfield FDI Service



Source: Author, from FDI Markets

However, the significant growths of inward FDI in overall SEA countries were not equally shared by each 8 countries. Deeper on country level, FDI in service was dominated by Singapore. In 10 years' time, Singapore outnumbered other countries' FDI value except only in 2005 where Vietnam had a sharp increase to more than 3 million USD. In 2011, Singapore reached the highest inward FDI value in service with almost reaching 8 million USD. Meanwhile, there were none from seven other countries reaching even just 4 million USD. Singapore is indeed a developed country. With only a small population and strong system and advanced technology means Singapore's service sector is on another level compared to other SEA countries. In fact, their strong retail and banks, and advanced electricity and water access makes other countries hard to catch up. Only Vietnam tailing from behind but still had huge margin. On the bottom side was place by Laos and Cambodia. Laos, in particular, had never received foreign investment in service sector until 2008.

Figure 16: Inward Greenfield FDI Service 2003 in ASEAN-8

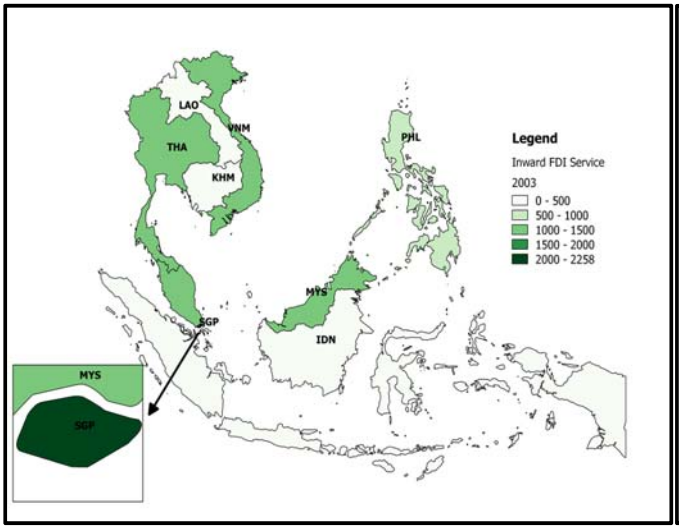
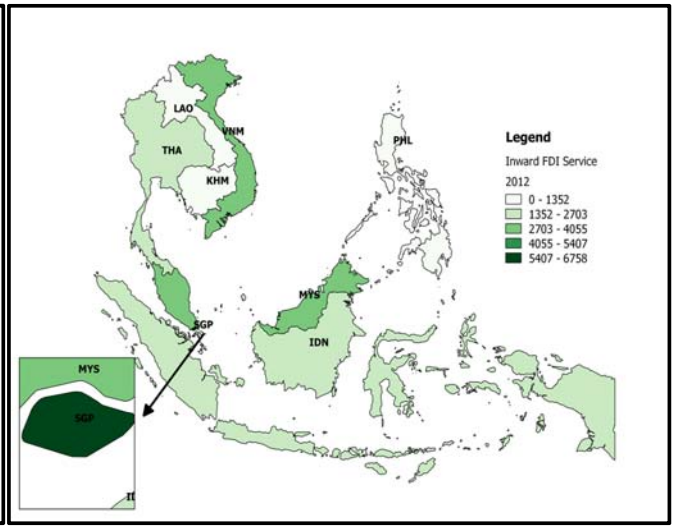


Figure 15: Inward Greenfield FDI Service 2012 in ASEAN-8



From figure 15 and 16, which indicates inward FDI service value through color, it can be seen that the dynamic has not experienced much change. Most of the countries were in the same color in 10 years' time. However, like previous thematic maps, the value of each color segments experience a shift in scale. In 2003, the darkest green color was 2.2 million USD, whilst in 2012 was 6.7 million USD. These maximum values were owned by Singapore which as previously mentioned, the highest country to receive service sector of FDI in 10 years' time. While Singapore stayed in the darkest green segment, Cambodia and Laos also experienced the same but in the lowest value segment. They both stayed in the lightest green color. However, both of them also managed to have an increase in inward service FDI. Cambodia went from 51 thousand USD of inward FDI to 833 thousand USD. Laos also went from 34 thousand USD to 307 USD.

In overall, service sector had never been a huge investment in most SEA countries comparing to other two major sectors of agriculture and manufacturing. It has been clear that service sector have not been the main interest for foreign investors to SEA countries. However, it clearly can be suggest that it has been improving throughout the years and it is possible to catch the value of FDI in other sectors in years ahead.

4.1.3 Country Capabilities

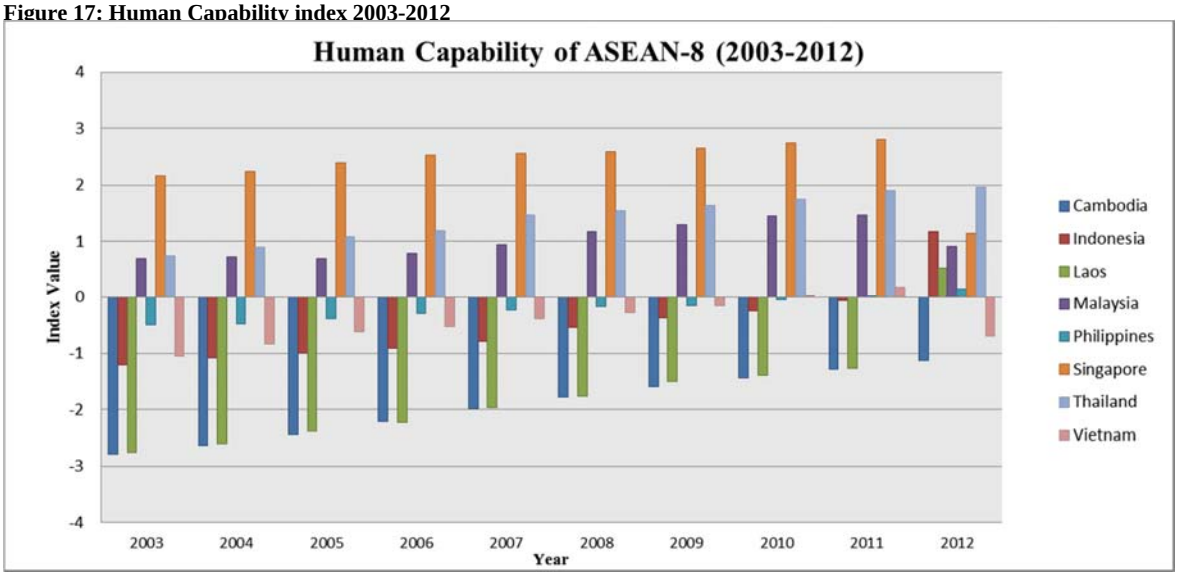
This section consists of description analysis on the index value of 3 country capabilities namely human, infrastructure, and government capability. These 3 capabilities are divided into three subsections. Each figures shows graph of trends in each index values. As mentioned, these values are acquired from principle analysis component (PCA). The explanations of those 3 capabilities include bar graphs and thematic maps to show trends and visualization on the value. Even though the index data was from a combination of original proxies, the explanations and analyses will also translated on how the original proxy behave within the index score. The detail explanations of those 3 index values are elaborated further in subsections below.

4.1.3.1 Human Capability

The first country's capability is human capability. It is proposed by United Nation Development Programmed that human should be measured by three essential

basic capability to develop a have a good livelihood in the society. Those three capabilities are income, longevity, and education. In country level, these three capabilities are translated into the aggregate value of GNI, life expectancy, and tertiary enrollment which also become a main measurement for UNDP's Human Development Index (HDI). On that regards, human capability in this research adopted these proxies which then combined into one index value through PCA technique. All three proxies are explained well in this index as all of them have a sampling explanation above 50%. In sampling adequacy wise, those three proxies also have a KMO score above 0.65 which arguably adequate enough to be assessed.

Figure 17: Human Capability index 2003-2012



Source: Author, 2017, operated using PCA in Stata.

Figure 17 shows the human capability index of 8 SEA countries in 2005 and 2012. In overall, 8 SEA countries had a human capability in the scale of 3 and -3 in 10 years' time. However, the trends suggest an improvement throughout the years for all countries. It can be seen from the first year of 2003 that only Singapore that surpass the value of 2 whilst both Cambodia and Laos reached almost -3 for their human capability. In 2012 however, only Cambodia that earned below -1, which still counts as an improvement comparing to the previous 10 years.

At the beginning of the period, majority of countries had their value below 0. Only Malaysia, Singapore and Thailand had value always above 0 in a decade. These three countries are indeed ahead from the rest of the countries. Their life expectancy, for instance, were always reaching above 70 years. Singapore's population had the longest years of life with above 79 years old in 9 years' time. Their gross national income also far ahead than the others with a minimum of 20,000 USD every year and reach its highest in 2012 with 51,110 USD; doubled the value of year 2003. Malaysia and Thailand are also ahead to other 5 countries that had a minus value in education and income generation. Their tertiary enrollment had always above 26% in 10 years. Thailand in particular had never been below 40% of enrollment rates, making them the highest education production above other countries, including Singapore.

On the other hand, Indonesia, Vietnam, Cambodia, Philippines, and Laos found it hard to earn a positive value. From these countries, Vietnam was the first to reached positive value even though it takes 8 years to do it. Cambodia is the only country that never reached a positive value. Indeed, throughout the years Cambodia had their national income of 880 USD per year in its highest in 2012. Unlike the rest of the countries, Cambodia had never even reached 4 digits of national income. As Cambodia and Laos are side-by-side neighbor country, it is interesting to find out that in this specific period they have a life expectancy average of 64.8 years old. This average is the lowest than other 6 countries.

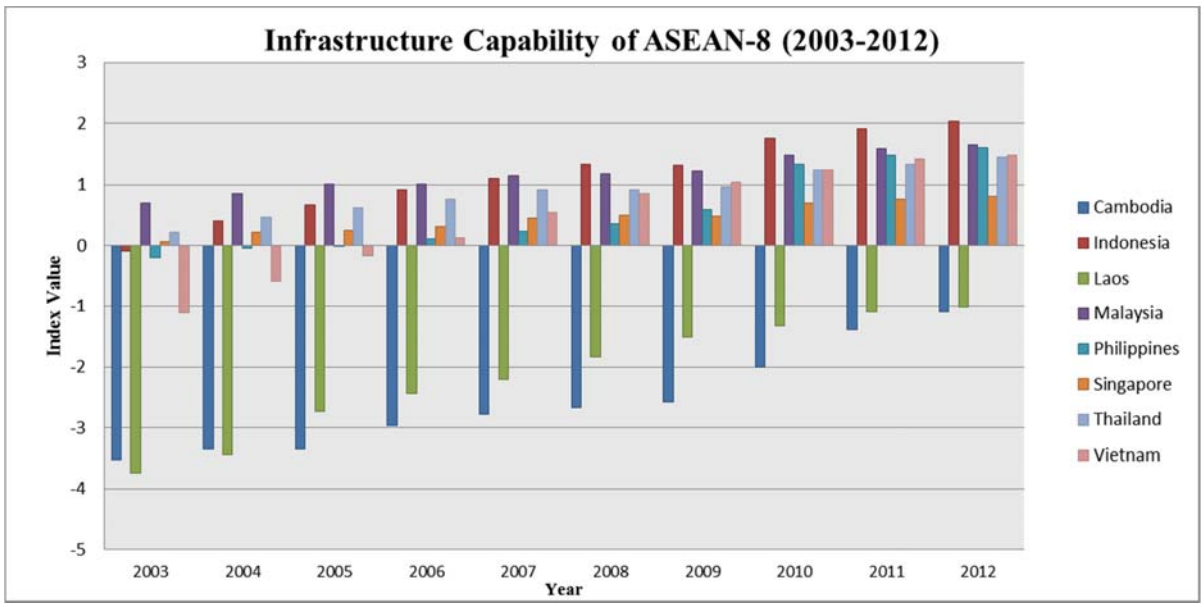
Indonesia and are Vietnam are arguably had the most drastic improvement in this scope. They were the third and the fourth lowest rank of human capability in the beginning of the period. Both Indonesia and Vietnam only received a national income of 510 and 900 USD in 2003, respectively. In 10 years after, Indonesia received up to 3570 USD whilst Vietnam earned 1550 USD. None of any other countries create such an improvement margin in this time period. Indonesia also had a significant improvement on health with an increase of 11.4 years of age in 10 years' time. However, Vietnam was one of the countries that a significant blow in 2012 with Singapore, Malaysia, and Philippines also experienced a decrease. On the other hand, Indonesia and Laos experienced a major increase in that year,

With this condition, it can be suggested that most of the time these 8 countries experienced an improvement on income, health, and education of the society. Even though the pace of improvement were varies but it indeed shows that their societies were gradually able to increase their basic capabilities in life.

4.1.3.2 Infrastructure Capability

In country's perspective, human is not the only capability to be considered as capability approach endorse a set of capability to be endorsed to achieve a state of being, especially when it comes to inequality. Thus, this research infrastructure is one of the essential capabilities to be considered. If human is the heart of a country, then infrastructure is indeed the backbone. As mentioned in chapter 2, it is the essential element to create human become a society, business to meet the market, and an access for human to have a commute daily activity. In this study, Infrastructure capability is elaborated into three major proxies, namely mobile subscriptions, internet usage, and freight volume. Same as human capability, these proxies are combined into one index of infrastructure capability. Each proxy, in this case, is also explained in the index for more than 50%. Sampling adequacy of each proxy is also above 0.6. Thus the index of infrastructure capability is good to be proceeded.

Figure 18: Infrastructure Capability Index 2003-2012



Source: Source: Author, 2017, operated using PCA in Stata.

In case of SEA countries, infrastructure capability has been their concern of improvement and a major priority in government's agenda. It is proved on their vast increasing trend of infrastructure capability in the scope of 2003 to 2013 which shown in figure 18. It took only until 2006 for the majority of countries to have a positive value of the index. This trend is perhaps understandable as most SEA countries, excluding Singapore, are considered high speed developing countries. The overall scale of index value is between -4 and 2. In the first half of the period Malaysia outshone other countries with its superior infrastructure. In the first year Malaysia had the record of more than 640,000 air freight volume. It is the highest carry from all countries and years. Their internet usage rates also in s region of 34%, making them the second highest after Singapore. Their mobile subscription is above 11 million. It is still below Indonesia, Thailand, and Philippines but enough to make them the highest rank of infrastructure index.

Malaysian superiority in infrastructure capability only last until 2007 with a slight higher than the 2nd place, Indonesia. In 2008, even though Malaysia kept on improving but it is not enough to let Indonesia took the first place of infrastructure capability. Indonesia had a significant increase most of the years. Their margin of increase is most of the time higher than any other country. On that time their mobile subscription is massively increasing. From a roughly 93 million phone subscribers in 2007, Indonesian population subscribed mobile for more than 140 million units the next year. In the same year (2008), Indonesia also had an increase in internet usage rates from 5.9 to 7.8 percent. Years after, Indonesia was unchanged in pole position of infrastructure index. 2012 became the highest year in infrastructure capability index for Indonesia reaching 2.03. This value is interpreted to have more than 640,000 units of air freight volume, 14.5% of internet user rates, and a mobile subscription of more than 282 million. That is definitely more than Indonesian population with approximately around 250 million people. It then can be concluded that more than 10 million people of Indonesia had more than 1 mobile subscription.

Indonesia is not the only country that had a major improvement. Thailand, Philippines, and Vietnam were also doing well. Vietnam, in particular, had an amazing positive experience. Begin with below -1 in 2003, Vietnam reached a value of 1.5 in 2012; making them from the third lowest to the fourth highest rank which just slightly less than Philippines. In that year, Vietnam had a 39 percent of internet usage rate. Only Singapore and Malaysia had higher percentage. They also had more than 131 million mobile subscription; the highest for them in a decade.

From these 10 years, Only Cambodia and Lao that did not reached any positive value for their infrastructure performance. But they did have an improvement every year. From these two countries, Laos had the most improvement. They came from the lowest at the beginning of the period with -3.7 up to just -1 in the last year of the period which beats Cambodia in the process. Cambodia is indeed the worst and the slowest improvement progress in terms of infrastructure. Their average of freight volume in 10 years was only 4,663 units and their internet usage rate had never reached even 5 % of the population.

Indonesia may have the highest infrastructure capability and Cambodia placed as the slowest pace of improvement. But from this trend, it is interesting to see that Singapore did not recognize as the strongest. With the use of these three proxies, Singapore had only be the third, fourth, and even fifth highest rank. They should be popular around the world to have sophisticated and superior infrastructure. In fact, it is one of the elements that made Singapore considered as a developed country. In this case, Singapore was indeed a top country. Their internet access was above 50% in the beginning in reached above 70% in 2012. None of any other countries could even reached more than 65% in a decade. However, other proxies indicate counts rather than rates which at times are dependent on the population. Mobile subscription and freight volume of Singapore were understandably below most of the SEA countries as their population was always been the tiniest. f the proxies considered any physical infrastructure as rates or ratio to the population, the graph would definitely shows different result and ranks, which arguably, Singapore would take place as the first

In overall, the trend of infrastructure capability in SEA countries was always heading to improvement. There was no indication of decreasing value in all the proxies that is used. It can be suggested that SEA countries were also concern not only about physical aspect but also the infrastructure of information and knowledge through online platform. Mobile and internet users were increasing all the time. Some of them were doubled and tripled the value in only a decade. Some of them were slowly progressing, but for sure, all of them realized the importance of information infrastructure.

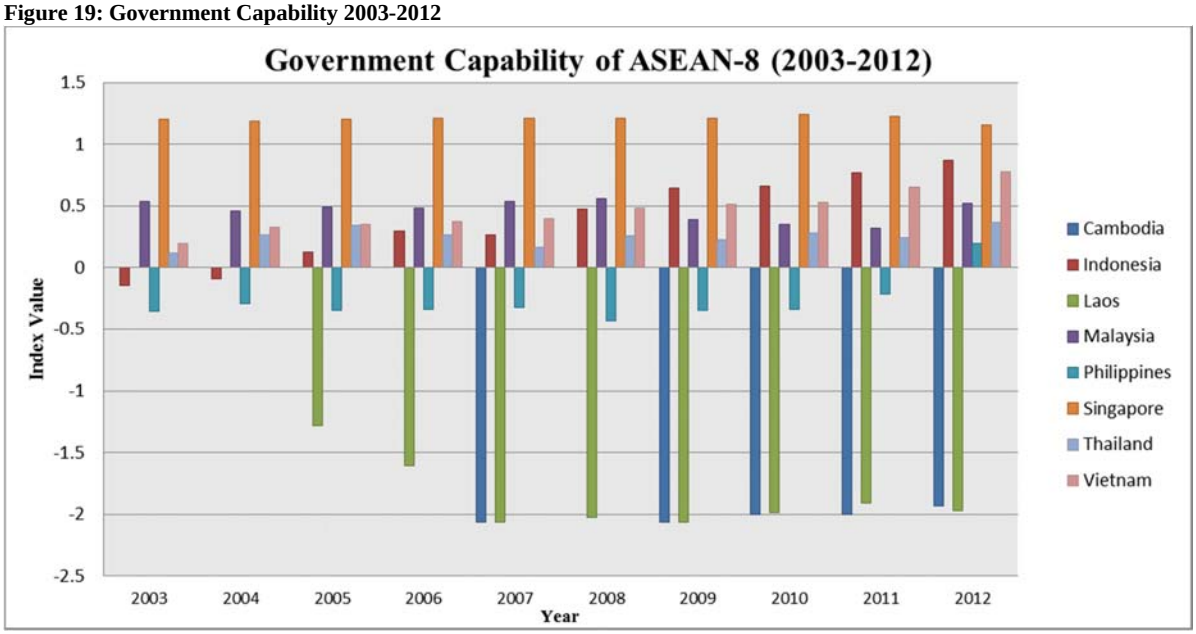
4.1.3.3 Government Capability

In this study, government's capability also an essential element to fulfill country's capability set. Various researches have claimed the importance of government performance when it comes to both FDI attraction and income inequality reduction. Therefore, government is decided as one of the key component of capability in FDI-income inequality nexus. Government capability consists of corruption and index which represent public trust and openness regulation and education expenditure in a percentage of GDP. Education has famously known as one of the component for inequality reduction. In fact, education in its advance degree

production had been included in human capability. Therefore, the perspective of national expenses, education is also included in government capability. Those two proxies were also combined into 1 index of government capability. The assessment process is similar with human and infrastructure capability. However, the result is rather different. The sampling explanation is also more than 50% percent. But their sampling adequacy is slightly below the other two capability variables with only 0.5. In a data reduction technique, it might not the best score of robustness. But it is not the weakest either. Therefore, in this research, it is decided to be proceeded anyway in order to provide a full answer on the research question. But still, these KMO score of sampling adequacy should be well noted for future development of the research.

Figure 19 below shows trend of government capability in terms of corruption index and education expense rate. Before further analysis on trends and value, it is also important to have another note regarding the data availability. As can be seen, the value of Cambodia is missing in 2003 to 2006 and 2008. Laos had the same problem for 2003 and 2004. This is due to missing values for those countries in the original proxy of education expense. As far as this study made, this is the best data that can be derived from World Bank as other credible data publishing institution gave less count in the year of 2003-2012. It then should also be aware for future research to increase the reliability of descriptive analysis.

Figure 19: Government Capability 2003-2012



In a comparison to other two capabilities of human and infrastructure, government had an interesting mix of trends between countries. Unlike the previous other which tends to increase and improve in value, government capability in some countries had some decreasing trends for several countries such as Cambodia, Malaysia, and Laos. In overall, government capability had the lowest range of value comparing to human and infrastructure with only in a scale of -2.1 and 1.3. It shows that the dynamic of these proxies is not as high as other capabilities. However, inside this range of value, some countries experienced a fluctuating performance, which

rarely be seen in human and infrastructure as most of them shows a stable inclining trend.

Laos was the probably the most visible inclining trend. It begins with -1.3 in 2005 and went down to reach -2 in 2010 which at the end it improved again slightly to be -1.9. In 2005, Laos put their education expense of 2.4% of GDP. It then gradually went down for the next 5 years to be 1.65% in 2010, which became the smallest portion for them in a decade. Their corruption index was also declining from 3.3 out of 10 in 2005 down to only 2 in 2010. It then only increased as much as 0.1 point in 2012. It makes them the worst public trust and regulation transparency compare to other SEA countries. Cambodia was also side by side with Laos. In average, corruption index of Cambodia was the worst with only reaching 2.1 out of 10 points. Their education expenditure was also only in the range of 1.5to 1.7 percent of GDP. From this 10 years trend, It seems that Cambodia and Laos does not show any will of improvement in this aspect as they went down and seems stayed at that region of value.

In the top of the table, Singapore obviously was far ahead from other countries. They even one of the top in the world in terms of transparent and healthy governance. In fact in a decade, they never had a corruption index below 8.7 with reaching its highest score in 2010 with a value of 9.4 out of 10. This almost perfect score made them placed far beyond other countries in government capability. Moreover, Singapore set their education expenditure in average of 3.5% throughout the years. Even though it made them placed as the highest rank, but is still below Malaysia and Vietnam with both have an average education expense around 3.8% of GDP.

From these steady and even declining performance, Indonesia and Vietnam acted in different way. They both had a sustained developing government capability. From the first year of 2003, both Indonesia and Vietnam earned a corruption index of 1.9 and 2.4, respectively. For both countries it was the lowest score they ever had. In 2012, however, both Indonesia and Vietnam derived a point of 3.4 and 3.1, respectively. It was the highest point they had received. These ranges of point are definitely not the highest among SEA countries with Thailand and Malaysia had never been below 3.5. But both Vietnam and Indonesia shows their way on how to have a sustainable improving government performance. They both showed awareness and focus to build a better government capability.

In overall, government capability trend was unlike human and infrastructure capability in SEA countries. There is a fusion of worsening trend, stagnant performance, and sustainable improvement on openness and education concern. These dynamic is perhaps with the fact that government commonly sensitive with a country's political stability and regime. SEA countries are also a mixed of monarchial, republic, and democratic system, which perhaps makes them contradicting with each other when it comes to government capabilities.

4.2 Inferential Analysis

After analyzing trends of each variable, it indeed found that income inequality through gini index had rather stable trend in a decade with a direction of slightly

declining. On the other hand, 3 major sectors of FDI was showing a rather increase in value in 10 years' time. Moreover human and infrastructure capability of SEA countries most of the time had an inclining trend towards better condition and situation. Government capability on the other hand shows a mixed trend for countries. Few of them interestingly showed a declining performance, Some of them steady with not much improvement nor worsening, but two of SEA countries still showed a sustain enhancement of government capability.

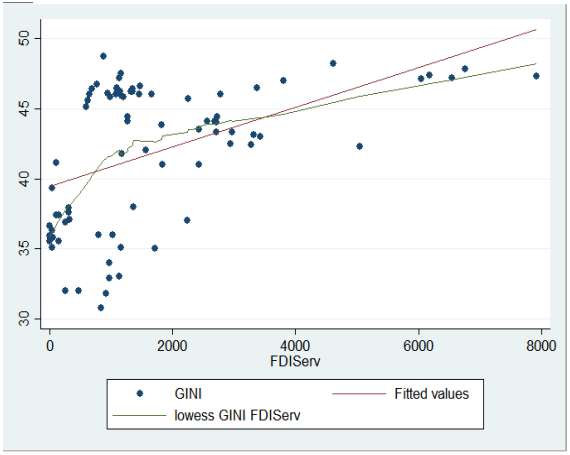
However, these are trends of each variable without any interactions from other residuals. Therefore, those analyses have not fully answered the research question. Therefore, this section elaborates the relationship and affection behavior between all variables that has been discussed. It mainly analyzed how FDI impacting income inequality which operated in various scenarios. It starts with testing the straight forward effect between FDI and income inequality. It then further analyzed with the presence from 3 country's capabilities as the interaction term.

Lastly, FDI sectors and income inequality will have a further relationship test with the original proxies from each of the capabilities variable. In aimed to provide ca confirmation from the previous test of accounting the index value of those capabilities and also to provide deeper insight of which proxies that determines the relationship and how is the behavior of these relationships.

In conducting the computation and analysis, assumption test has been done to accommodate the best computation of analysis command. Some of the results are also the reason of structuring the analysis to be separated in different stages. As the basic explanation of these assumption tests had been discussed in chapter 3, the results of the tests are presented as follow:

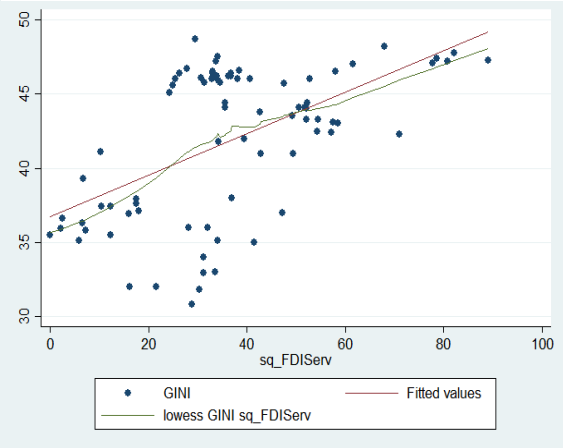
- *Normality test*: Linearity is seen through two ways. One could be assessed visually through comparing with normal line distribution. Another assessment is through Swilk-r result. In this assessment, all data used in this study had an insignificant result of Swilk-r which shows that the predictor and explanatory variables are linear.

Figure 20: Linearity test of FDI service



Source: Author, 2017, computed in Stata

Figure 21: Linearity test of square root FDI service



Source: Author, 2017, computed in Stata

Figure 20 and 21 is one of the examples of visualized linearity test from FDI service. The original value of FDI service (figure 12) has creates the green line

at times located away from the fitted values of red line. There are two possible options to increase the linearity between dependent and dependent variables. It can be done through either logged or square rooted the variable. In the case of FDI service, the author decided to square root the variable which as shown in figure 21, the overall behavior of the variable (green line) is more similar with the similar value comparing to the original variable in figure 12. Most of the variables deployed with logarithm or square root which dependent on which shows better linearity. In this case, FDI manufacturing and FDI service use the square root. GNI, air freight volume, internet user, mobile subscription rate, corruption index, and education expenditure are deployed with logarithm. These changes will only affect the interpretation of the result. Variables with logarithm is interpreted as percentage, while Square rooted variables is interpreted as square root.

- *Multicollinearity*: At the very first stage, the computation of multicollinearity includes all variables. However, the test result shows a very high linearity between indicators from different variables. Thus, the only way to push the test through is to reduce until leaving only few variables to be analyzed. It would not be an ideal model to just test several indicators from the original framework. Therefore, in order to still accommodate all indicators from all variables, the multicollinearity test was done separately for each model. For instance, the multicollinearity test of infrastructure capability indicators is different with the multicollinearity test of government capability. In this way, all models have passed the multicollinearity test which shows values below 10 indicating a shows low linearity level.
- *Homoscedasticity:* An insignificant result of the test indicates that the data is heteroscedastic, which how it supposed to be to pass the test. However, the test of all indicators suggests an insignificant result, which indicates homoscedastic form. Therefore, in final regression the computation is added by the command of 'robust' to create heteroscedastic form.
- *Model specification*: This probably one of the crucial tests as failing the test would cause the model to be rearranged. In this case, each models that want to be regressed shows insignificant value, suggesting that the model is fit enough to be regressed.
- *Independence*: this test measures the odds of how error in one residual are associated with another residual's errors. A significant result shows no first order correlation. In this case, all models show an insignificant result. Thus, it is fit enough for the next step.
- *Hausman test*: This test will suggest either to use fixed or random effect in the regression. Fixed effect analysis can only support inference about actual pool that we analyze (country/city). On the other hand, random effect summed the variation across entities random and uncorrelated with the dependent or independent variables. All models in this research resulted as insignificant. Thus, analysis is done with random effect command.

All the tests had been firm and strong. After separating the whole framework into smaller models, the assumption test shows satisfying results. The final test is also done in accordance with the assumption test.

4.2.1 Impact of FDI to Income Inequality

After passing several assumption tests, panel regression is deployed in order see the effect of each FDI sectors to gini index. In this stage, all assumption tests indicate no problems with the model specification, autocorrelation, and multicollinearity. With passing these three test, panel regression is eligible and robust to be presented in one model of a complete scenario where all FDI sectors and control variables are included.

Therefore, the regression was deployed into four different models. The first three models show the test of each FDI sectors towards gini index separately with the inclusion of all control variables. The fourth model includes all FDI sectors towards gini index with also an inclusion of the same control variables, which consist of initial year gini index, GDP, percentage of trades in GDP, and total population. These models of regression are shown in figure 16 below.

Figure 22: The Impact of inward FDI to Gini Index

	(1)	(2)	(3)	(4)
VARIABLES	GINI	GINI	GINI	GINI
FDI Manufacturing	0.00925			0.00401
	(0.01)			(0.01)
FDI Agriculture		0.189		0.151
		(0.22)		(0.33)
FDI Service			-0.00124	-0.00980
			(0.02)	(0.02)
Initial year Gini	0.736***	0.753***	0.753***	0.752***
	(0.04)	(0.04)	(0.03)	(0.03)
Initial year GDP	-0.101	0.159	-0.0309	0.101
	(0.25)	(0.23)	(0.23)	(0.31)
Trade	0.00945***	0.00974**	0.0110***	0.0127***
	(0.00)	(0.00)	(0.00)	(0.00)
Total Population	1.11e-05**	1.46e-05**	1.52e-05***	1.50e-05**
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	9.394***	6.328**	8.302***	6.670**
	(2.16)	(2.64)	(1.81)	(2.99)
Observations	80	71	80	71
Number of year	10	10	10	10
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Source: Author, 2017, compute with Stata

The result shows that FDI in manufacturing, service, and agriculture sector are not significant in affecting gini index growth. Although no significances, it may not do any harm to see the relationship attitude. On that regards, the coefficient value of manufacturing and agriculture sector shows a positive sign. Therefore, the appearance of these sectors leads in income inequality. Meanwhile, the increase in FDI of service could lead to the reduction of gini index. However, as mentioned, none of them are ld significant. In addition, the control variables in each models shows a same result pattern. Trades in a percentage of GDP, for instance, shows a significant effect in every model. Thus, higher trades significantly lead to higher income inequality. Moreover, larger population also stimulates more inequality.

4.2.2 FDI sectors and Income Inequality with Country's Capabilities

The regression result of FDI towards gini has confirmed the non-linear relationship of FDI and income inequality. In this section, the relationship of those two variables is further tested with an interaction from three variables of country's capabilities, namely human, infrastructure, and government capability. Previous studies suggested that when these variables are included, it provides instantaneous effect to the relationship of FDI and income inequality. In fact, previous regression in this study suggested the three major FDI sectors are not significant in affecting gini index. It perhaps needs something that would able to absorb and extend the magnitude of the relationship. This section is aiming to provide more understanding in this relationship through the three country capabilities.

In order to create those three variables to have a strong and robust value, Principle Component Analysis (PCA) was deployed to combine all indicators from each variable. In this case, human capability is derived from Gross National Income, tertiary enrollment rates, and life expectancy. Infrastructure capability value also combined from three indicators of fright volume, mobile subscription, and internet usage. Moreover, Government capability consists of corruption index and education expense in percentage of GDP. Data reduction for these three variables was decided due to a high multicollinearity between indicators from different variables. Hence, it is impossible to account them in one regression model, which actually is important in this study. Therefore, PCA would be a strong solution which, in fact, these three variables has a result of low multicollinearity. In result, it can be run in one regression model along with three FDI sectors and control variables of initial gini coefficient, GDP, and total population.

However, deploying PCA is not without a problem. In data explanation wise, these three variables is strong since all indicators are explained the final index value. Moreover, the explanation of all indicators is more than 50%. In other words, the unexplained portion of indicators in all variables is only a minority. It is important because the variable is consisting of those indicators and the fact that those variables are explained well from the indicators will only make them more robust. But the problem is the sampling adequacy. Before a final data reduction to three indexes, all indicators had been through KMO test to assess their adequacy. All six indicators from human and infrastructure capabilities have above 0.65 which indicates a quite adequate sample. Government capability's indicators, however, only have 0, 5 of KMO score. It indeed not the weakest sample but it obviously not the strongest value. It shall be a strong note for future recommendation and is still deployed because in this case, a regression of the full framework between all FDI sectors and the three set of country's capability is important to provide clear answers for the research questions. In fact, the KMO score is still above 0.4, which is a threshold of a very weak sampling adequacy. Thus, the research goes on with those values to elaborate the relationship of FDI and income inequality

Figure 23: FDI to income inequality in 3 country's capabilities interactions

	(1)	(2)	(3)	4
VARIABLES	GINI	GINI	GINI	GINI
FDI Service	-0.0392**			-0.0293
	(0.02)			(0.02)
FDI Manufacturing		-0.0315**		-0.00671
		(0.02)		(0.02)
FDI Agriculture			-0.0423	-0.0481*
			(0.06)	(0.03)
Human Capability	3.171***	0.861	0.647	2.207***
	(0.41)	(0.67)	(0.57)	(0.61)
Infrastructure Capability	-1.259*	-1.830*	-1.175	-1.139
	(0.72)	(1.10)	(1.00)	(0.92)
Government Capability	-4.400***	-0.396	0.715	-4.319***
	(0.75)	(0.75)	(0.88)	(1.43)
FDI Service*Human Capability	-0.0603***			-0.0617***
	(0.01)			(0.01)
FDI Service*Infrastructure Capability	0.0134			-0.0294**
	(0.01)			(0.01)
FDI Service*Government Capability	0.168***			0.188***
	(0.02)			(0.03)
FDI Manuf*Human Capability		-0.00614		0.00861
		(0.01)		(0.02)
FDI Manuf*Infrastructuret Capability		0.0191		0.0162
		(0.02)		(0.02)
FDI Manuf*Government Capability		0.0556***		-0.00177
		(0.02)		(0.02)
FDI Agri*Human Capability			-0.00923	0.00799
			(0.04)	(0.04)
FDI Agri*Infrastructure Capability			0.0450	0.0424
			(0.06)	(0.03)
FDI Agri*Government Capability			0.0519	-0.00185
			(0.08)	(0.09)
Initial year Gini	0.891***	0.878***	0.765***	0.969***
	(0.04)	(0.07)	(0.10)	(0.10)
Initial year GDP	0.199	0.216	-0.0417	0.210
	(0.13)	(0.23)	(0.23)	(0.15)
Total Population	2.84e-05***	1.99e-05***	1.01e-05	2.95e-05***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	1.961	3.525	10.08**	-1.088
	(2.27)	(3.74)	(4.95)	(4.35)
Observations	73	73	73	73
Number of year	10	10	10	10
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Source: Author, 2017, operated in Stata

Figure 23 shows the final result of three FDI sectors towards gini index with an interaction from three country's capabilities. Model 1 to 3 shows the result of service, manufacturing and agriculture sectors, respectively. Model 4 is the complete scenario where all FDI sectors and its interactions with all capabilities are accounted.

The result shows that each FDI sectors lead to gini reduction when the interactions of FDI and all country's capabilities are kept constant. However, the significant level appears in different stage for each FDI sectors. Both service and manufacturing sectors only appears to be significant when other sectors does not included in the model. Agriculture sector, on the other hand, appears to have a significant relationship with gini reduction only in a complete model whereas other FDI sectors and its interactions are considered. Manufacturing and agriculture sectors are indeed to have the most significant relationship with gini index, but service sectors appear to have a higher coefficient level to reduce gini. The result of model 5 in service sector implies that when other sectors and the interactions from 3 capabilities are considered constant, an increase in 1 percent of inward FDI service leads to gini reduction for 0.048 point. This reduction of gini point is slightly higher than service and manufacturing sector where result shown both of them can reduce gini to 0.039 and 0.032, respectively. It implies that investment in agriculture sector could provide more equal income distribution than any other sectors. Arguably, FDI in agriculture would absorb a larger scope of employment. Moreover, agriculture also arguably has less demand on high education degree. This enhances the opportunity of a lower education background class to be benefited from foreign investment.

In mediation term, each capability have different affect towards different FDI sectors. Human capability has a significant marginal effect in FDI service to reduce Gini. The effect also seems robust as two different models show the same negative effect and significant result. However, there is no significant sign in interactions with other sectors. Infrastructure also appears significantly in creating FDI to reduce inequality in service sectors, but only in a complete scenario. These three capabilities does not appear to be significant when it interact with FDI manufacturing and agriculture. The coefficient sign from some of the interaction terms also changing when the model change, which might indicate that the robustness is not in a maximum level. Therefore, in this study, further test will be conducted with each indicator from every capability variables. In the next section, FDI and income inequality is regressed along with every indicator without an index value. It aims provide further answer of what specific factors that actually create a negative marginal effect towards FDI-gini nexus, which cannot be elaborated in this section. However, this section strongly confirms that human, infrastructure, and government capability provides linear relationship of FDI to reduce gini index.

4.3. Factors of Country's Capabilities that determines FDI and income Inequality's Relationship

Three country's capabilities had been tested as mediating variables for FDI towards income inequality. The overall result showed that the interaction from these capabilities is significant in creating a marginal effect towards FDI to reduce gini index, which leads to more equal distribution. Moreover, it was also found that the significant level appears differently in different models. The interaction result also varied in depending on which sectors it interact with. Even though it suggested a linear result but since all variables' value are indexed, we cannot elaborate further which factors that determines the relationship of FDI and income inequality.

Therefore, in this section, the research will test each indicator from each variable to determine further to what extent does country's capability plays role in determining FDI-inequality relation. There are 2 main differences in this section from

the previous regression. Firstly, unlike in previous section where each capability has their value, in this test all indicators are used separately as mediation to each of FDI sectors rather than an indexed value. Secondly, since a very high multicollinearity between indicators from different variables, the regression cannot be presented wholly in one model. Hence, FDI sectors and each of the capabilities are tested separately. In result, this section provides three subsections of human, infrastructure and governance capability. Each section is testing FDI sectors with indicators that belong to the specific capabilities. Even though these variables are tested differently, comparison between FDI in the same capability is still robust to be compared since it is measured with the same control variables. The figures below are a compilation of the final model of each FDI sectors result. The reason is that this study would like to compare each FDI sectors when it interacts with specific indicators of country's capabilities in completed scenario with the inclusion of control variables and every indicators of capability.

In statistical perspective, this test is conducted to also support the previous test as those tests have several assumption result weaknesses that actually resolved here. For instance, the index that has been used from three capabilities did not have the strongest sampling adequacy. In this section, sampling adequacy test is not required since none of them have data reduction and bundled. Moreover, several model of previous section did not pass autocorrelation test which might affect the robustness of the model. In this section, all models have passed autocorrelation and other assumption test required. Indeed, Autocorrelation is still widely debated its usefulness for test assumption. But this is still important to be noted for future research to gain more robust regression model.

In overall, this section tries to breakdown into factors that determines the relationship of FDI and income inequality. It is not able to compare between capabilities, but it definitely will elaborate the importance of each capability indicators in the case of FDI and income inequality.

4.3.1 Human Capability

As capabilities proxies can only be presented separately, human capability's indicators is the first to be deployed as an interaction terms. It can be seen in figure 18 which consist of three models. The first model shows a complete scenario of FDI agriculture with a complete interaction from indicators of GNI, life expectancy, and tertiary enrollment. The second and third model also showed the same routine but for manufacturing and service sector respectively.

Figure 24: FDI towards Income Inequality with Human Capability

	(5)	(5)	(5)
VARIABLES	GINI	GINI	GINI
FDI Agriculture	-4.535***		
	(1.46)		
FDI Manufacturing		-0.254**	
		(0.10)	
FDI Service			-0.351***
			(0.13)
Gross national Income	-0.464	-0.0966	0.0990
	(0.54)	(0.22)	(0.28)
FDI Share*Gross National income	0.199**	0.0106***	0.0132***
	(0.09)	(0.00)	(0.00)
Life Expectancy	0.0890	0.0659	0.0631
	(0.10)	(0.05)	(0.10)
FDI Share*Life Expectancy	-0.0140	-0.000152	-0.000207
	(0.01)	(0.00)	(0.00)
Tertiary Enrollment	-0.327*	-0.0908	-0.0633
	(0.17)	(0.12)	(0.06)
FDI Share*Tertiary Enrollment	0.0807**	0.00294*	0.00494***
	(0.03)	(0.00)	(0.00)
Initial Year Gini	0.768***	0.809***	0.743***
	(0.09)	(0.16)	(0.06)
Initial Year GDP	-0.677	-0.561**	-0.630*
	(0.47)	(0.23)	(0.37)
LandArea	-6.13e-06	-3.42e-06	-3.80e-06
	(0.00)	(0.00)	(0.00)
Trade	0.0180***	0.0106***	0.0153***
	(0.00)	(0.00)	(0.00)
Constant	21.98**	9.601	8.710
	(9.95)	(6.78)	(10.65)
Observations	71	80	80
Number of year	10	8	10
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

Source: Author, 2017, operated in Stata

In a comparison of three different FDI sectors, the interaction with human capability's proxies varies in significant level and coefficient behavior. In is interesting to see that the result indicates a higher gini index value when GNI act as an interaction term. From these three models in figure 24, the this interaction from GNI is significant in all FDI sectors. Therefore, the result can be interpreted that a higher national income would significantly make FDI agriculture, manufacturing, and service create gini index to have a higher value, leading to a higher disparity of income distribution.

This same pattern can also be seen with tertiary enrollment as the mediation. When all three FDI sectors interact with tertiary enrollment the result suggest that is is significantly positive towards higher gini index. It seems that a higher advanced degree production would stimulate higher income inequality. On the other hand, the interaction from life expectancy to 3 FDI sectors seems to be insignificant. The significant of interaction from life expectancy perhaps make sense. A longer life population is would stimulate a higher disparity as huan in mature segments are increasing. This older segment is commonly judged as less productive class which typically lives their live with their savings and pension funds. While this older segments live a steady live with less production, the younger segments are on their track to keep on developing and have a bigger possibility to increase their incomes. With this situation, it is understandable that it potentially create a bigger disparity between the productive segment that can increase their income overtime and the unproductive segment that live a steady income live. Thus, an unequal income distribution shall keep on increasing.

However, the marginal effect that provided by tertiary enrollment is very interesting. From the literature review, previous studies indicate the significant marginal effect for tertiary enrollment on the relationship of FDI and income inequality. This study indeed provides the same result, but the coefficient sign tells a different story. Education commonly introduced as the factor to reduce income inequality. But the fact that it makes FDI to increase income inequality is hard to consume.

From these interactions result, it is important to realize that the main analysis should be the 3 major FDI sectors when all the interactions from mediating proxies are considered and kept constant. In this result, with interactions from all three proxies of human capability, all three sectors of FDI are significant in decreasing income inequality. From these three sectors, agriculture suggested as the biggest impact with 1% of increase in FDI agriculture would decrease gini index as much as 4.5 points.

4.3.2 Infrastructure Capability

In infrastructure capability, all three FDI sectors are tested with the interaction of air freight volume, mobile subscription, and internet user rate. Similar with human capability model, in this regression all infrastructure proxies are separately tested to each of FDI sectors. The result is shown in figure 25 with three models of each FDI sectors toward gini index results. Each of the models also includes the same control variables to have a high robustness to be compared.

Figure 25: FDI towards Income Inequality with Infrastructure Capability

	(5)	(5)	(5)
VARIABLES	GINI	GINI	GINI
FDI Agriculture	-7.664*		
	(4.53)		
FDI Manufacturing		-0.463***	
		(0.18)	
FDI Service			-0.754***
			(0.24)
Mobile Subscription	-3.701***	-1.250*	0.0551
	(1.15)	(0.65)	(0.50)
FDI Share * Mobile Subscription	0.698***	0.0267**	0.00560
	(0.21)	(0.01)	(0.01)
Internet Usage rate	-1.228	1.158*	0.794*
	(1.86)	(0.68)	(0.48)
FDI Share * Internet Usage rate	0.165	-0.0267**	-0.0375
	(0.37)	(0.01)	(0.02)
Air Freight Volume	2.694	0.0399	-1.411***
	(2.37)	(0.85)	(0.42)
FDI Share * Air Freight Volume	-0.358	0.00734	0.0687***
	(0.44)	(0.01)	(0.02)
Initial year GDP	0.137	0.111	-0.0852
	(0.28)	(0.16)	(0.25)
Trade	0.0129***	0.0115***	0.0154**
	(0.00)	(0.00)	(0.01)
Initial Year Gini	0.734***	0.818***	0.709***
	(0.08)	(0.08)	(0.04)
Constant	41.19*	22.80***	22.97***
	(22.76)	(8.78)	(7.92)
Observations	71	80	80
Number of year	10	10	10
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

Source: Author 2017, operated in Stata

From the result in figure 25, not all interactions from infrastructure proxies showing a significant result. In the first and second model, mobile subscriptions alone suggested to have a significant result in leading gini index to be reduced. However, when it acts as mediation for FDI-income inequality relationship it shows a significant positive result. In other words, it suggests that mobile subscriptions affecting two FDI sectors to significantly increasing gini index, leading to higher income inequality. On the other hand internet usage tends to change signs in different scenario. However, from three models internet usage only appears significant only one time but one the significant level appears, the coefficient for both of the proxy suggest a negative sign. It then can be interpreted that the interaction of internet usage creates a marginal effect to FDI manufacturing in affecting gini index to be reduced. It is interesting to realize that internet access is an important factor to create more equal distribution with FDI sector as the predictor variable. It perhaps an important element nowadays, where access to market and opportunity lies online as much as in the real world. Thus, an equal access to internet stimulates a chance for country to have an equal income distribution in the society.

Moreover, the interaction from freight volume also changes over different model and only appear significant once with a positive coefficient. But freight volume itself without the role of interaction also once appeared to be significant and negative. Therefore, air infrastructure is potentially a significant factor in reducing income inequality.

In overall, from three different models of FDI sectors in the concept of infrastructure capability, it is confirmed that all FDI sectors appeared to be reducing gini index when interaction from all three proxies and control variables are considered. However, in this 3 FDI sectors, only manufacturing and mobile subscription that have a strong significant sign for the impact. FDI agriculture have a slight significant level but the most impactful in terms of coefficient. The presence of infrastructure proxies as an interaction creates FDI agriculture impacting gini index to be reduced as much as 7.6 point. However, as mentioned, the significant sign is still obove 0.05 but below 0.1.

4.3.3 Government Capability

In section 4.2 where all capabilities are tested using index value, government capability is one of the significant variables in mediating the relationship of FDI and gini index. In this section it is furthermore tested using the original proxies of government capabilities which consist of corruption index and education expense in a percentage of GDP. The result of this concept is reflected in figure 26, which consist of three final models from each sectors of FDI. It begins with result from FDI agriculture, followed by the result of manufacturing, and ends with service sector. These three sectors from three different models are compred side by side with a full interaction from two government capability proxies and the exact same control variable.

Figure 26: FDI towards Income Inequality with Government Capability

	(4)	(4)	(4)
VARIABLES	GINI	GINI	GINI
FDI Agriculture	-2.082		
	(1.29)		
FDI Manufacturing		-0.225***	
		(0.08)	
FDI Service			-0.362***
			(0.05)
Corruption Index	-1.677	0.189	-1.966**
	(2.37)	(0.98)	(0.99)
FDI Share * Corruption Index	0.641	0.0633**	0.117***
	(0.41)	(0.03)	(0.02)
Education Expenditure	-0.426	-0.191	-0.394**
	(0.44)	(0.14)	(0.16)
FDI Share * Education Expenditure	0.125	0.0102***	0.0175***
	(0.09)	(0.00)	(0.00)
Initial year Gini	0.784***	0.844***	0.934***
	(0.09)	(0.11)	(0.05)
Initial year GDP	0.0883	0.0384	0.240
	(0.32)	(0.28)	(0.20)
LandArea	4.17e-06	9.19e-06	2.54e-05***
	(0.00)	(0.00)	(0.00)
Constant	14.37***	8.839**	6.874**
	(4.81)	(4.17)	(3.15)
Observations	69	73	73
Number of year	10	10	10
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

Source: Author, 2017, operated in Stata

From the result in figure 26, the proxy of corruption index has appeared to have negative sign twice but only appeared significant in service sector. Hence, it alone has a robust potential to decrease the value of gini index. However, when it took the role of mediations between FDI and gini, the result from three different model shows that it leads to FDI creating an incline gini index. The significant level also appeared to be strong in both manufacturing and service sector. The result of interaction from this proxy is as interesting as it hard to be consumed. It leads to an interpretation that country requires a less transparent government in order for FDI to create more equal distribution. It is a complex interpretation in practice. Education expenditure both as an independent and mediation also shows the exact same sign like the corruption index where when it mediates the relation, it tend to increase income inequality in manufacturing and service sector.

However, those interactions result shall not be the most important assessment. The major result in this test should be seen from the overall result from each of the FDI sectors when interactions from two proxies of government capability is considered and kept constant. In this case, FDI manufacturing and service have a significant negative result to gini index. Hence, in can be concluded that with an interaction from both corruption index and education expenditure, manufacturing and service is a significant FDI sectors that affecting the reduction of income inequality. From these two sectors in a concept of government capability, FDI service sector has the most impactful affection with an increase of 1 FDI service would lead to gini index reduction as much as 0.36 point.

Chapter 5: Conclusion and Recommendation

5.1 Conclusion

This study has provide 3 major steps of empirical analysis towards the relationship between inward FDI (per sectors) and income inequality with an interaction from country capabilities set in Southeast Asia. From these steps of analysis, this study comes up with 3 conclusion points. First, result suggested that FDI service, manufacturing, and agriculture sectors .tend to increase income distribution inequality. However, it is also confirmed that this relationship is not significant. This result is in line with result suggested by Vaustino and Vali (2011). It also previously confirmed by Reuveny and Li (2003), which stating that from 4 economic openness instruments, FDI in one of them that has a nonlinear effect towards gini coefficient.

The next stage of analysis provides result of the presence from three major country's capabilities of human, infrastructure and government capability. Tested using an indexed value for each of the capabilities, the result suggests that their interaction is significant in affecting the relationship of FDI and income inequality. However, the significant effect only appears strongly in service and manufacturing sector in their-own model. Agriculture sector, on the other hand, is not really significant and it only reached below 0.1 of significant level without surpassing the significant threshold of 0.05. However, it was only shown in a completed scenario where FDI sectors fit in one model with the inclusion all the interactions and control variables.

Therefore, the second conclusion is the significant result of marginal effect of country's capabilities in two major FDI of manufacturing and service. It confirmed the eligibility and significance of operationalizing capability approach in national level. This result bring us back to what Comin (2001) wrote that in practice, capability approach is not always concerning individual as a reference unit. It should be kept as a freedom of thought which adopted in any case that seek for reaching certain state of being (Robeyns, 2000). The presence of capabilities other than human in this research (infrastructure and government) provides evidence that capabilities should be elaborated in accordance to the reference unit. In fact, government and infrastructure capability provide a significant result in mediation the relationship of FDI and income inequality. This result also support the basic aim of capability approach which suggest that equality and welfare should not be seen in only singular value for the effect of certain function (1980). Indeed, as mentioned, human capability is not the only significant factor in determining the relationship of FDI and income inequality as government and infrastructure are also essential in determining factors that reduce income inequality. The result in this stage is also a support to the core argument that capabilities are the main concern in order to achieve certain functioning (Sen, 1979). In this case, it is concerning country's capabilities to achieve a state of equal income distribution.

In the last stage of analysis, government, human, and infrastructure capabilities are separately tested as the mediation towards each of FDI sectors relationship with income inequality. In government capabilities, both corruption index and education become a significant matter for the relationship between FDI and income inequality. Their presence creates FDI to significantly reduce gini. However, from 3 sectors, only service and manufacturing sectors that are significant. It then can

be argued that government capabilities become a higher concern in service and manufacturing industry.

In overall result of the final model, human capabilities are significant to all FDI sectors in affecting inequality reduction. It indeed in line with several previous studies that basic human needs that proposed by Sen (1979) is essential. When human basic capabilities are satisfied, there will be less disparity among others since same level of capability means that the chance to achieve equality is justified. Moreover, improvement on human capabilities would add more value to factor of productions. More productions would lead to growth and opportunities. Thus, it could create more chance to achieve the state of being equal (Cosbey, 2004). This theory arguable could be supported by the significant result of human capabilities in the case of FDI to inequality. With more population having higher capabilities, the benefit of inward FDI would spread more equally among the society. On the other way around, low level of capability lead to only certain level of high-skilled population can feel the benefit of FDI as MNEs typically hiring a rather high-skilled labor. Thus, leaving other part of the society left behind.

FDI towards inequality is lastly tested with the mediation of infrastructure capability. From 5 models of regression containing 3 infrastructure indicators and 3 control variables, results suggest that host country's infrastructure capabilities is significant to reduce inequality when inward FDI increase. The coefficient values are also typically high, especially when it compared to other capabilities model. It is confirming the importance of infrastructures' ability to reach stakeholders and create the benefit of an increase in FDI distributed more equally in the society (Wu and Hsu 2012; Zhang *et al,* 2010).

5.2. Limitations

This research has been gone through some difficulties. Firstly, the limited availability of data is affecting the research to hold test on older period of time. Indeed, the full range of data is in the period of 2003 to 2012. It may not too significant for the empirical analysis, as it testing the behavior and relationship regardless the period of time. But it indeed provides older analysis in descriptive section where it could have been better to provide newer and fresher information as it could be more related to current issue.

Secondly, is has been aware from the beginning that adopting secondary quantitative data as the research strategy possess some problems. One important limitation is that taking country level as reference unit and took aggregate value of secondary proxy leave a large gap of detailed information regarding the subject. As mentioned several times in this research, using this strategy would only generalized country's perspective without considering their characteristics. However, a highly dependency on quantitative data as the sample was proceeded as in this research period as it is the most suitable method for a short period of research time.

Thirdly, in the second stage of inferential analysis, factor analysis was deployed to combined proxies from each capability to an index value for the 2 country's capabilities. Only through this index value that all FDI sectors and all interactions from capability variables can be regressed in 1 model to present analysis on the whole original theoretical framework. It indeed successfully surpasses all

statistical assumption tests for regression but it still possess some problems with the data reduction technique itself. As mentioned several times in this study, none of the sampling adequacy test of all proxies that indexed reached the 0.7 KMO test. However, none of them are below 0.5 either. But still, without surpassing the threshold of a strong KMO test of 0.7, it should be noted that the future research should consider ways to reach an ideal strength of sampling adequacy.

Lastly, in the third stage of factors determination for FDI and income inequality relationship analysis, the limitation appears in the aspect of multicollinearity. The total of 8 proxies from 3 country's capabilities was unable to be deployed in one regression model. Therefore, in this research, regression of FDI and income inequality was deployed separately with proxies of each capability. Thus, with the use of original proxy rather than index value, the analysis of factors determination had been done separately in accordance with each capability concept. Moreover, in this analysis, FDI sectors were also unable to be presented in one completed model. Thus, the result of each capability is presented in three models of different capabilities. Even though the comparison of FDI sectors from 3 different models is still robust as is contains a same control variables, but providing a strong completed model where FDI sectors are included in 1 model could have enrich more insights and may state different pattern of result.

5.3. Recommendations

Income inequality is indeed a complex problem. As a matter of fact, the descriptive analysis of this research prevailed that in 10 years' time, income inequality experienced a slow pace reduction. Some of them even showed an increase of trend in Southeast Asian countries. It should also be noted that most SEA countries were known with their fast economic development. However, disparity of income distribution was left stagnant. As mentioned as well that academically, only few research took SEA countries as the scope of income inequality. It becomes more clear that an increase of income inequality problem should have an increase in academic and practical awareness. Therefore, it is important to bring this topic for future research in order to create stronger and robust result to be considered for a policy recommendations.

On that regard, future research should capture the whole scope of country. As in this research, 8 from 10 SEA countries that were captured due to limited access to data required for 2 other countries. Future studies could also consider expanding indicators in both independent and dependent variables. The sectors of FDI could be further enriched, while income inequality can also be measured with other method such as Atkinson's model and income decile.

In accordance with the limitations above, Future research in a same topic has a possibility to elaborate the expansion of country's capabilities, especially in the case of combating the raise of income inequality. In fact this research has started the elaboration from adopting the basic proxy of human capability to expansion of adding two other country's capabilities (infrastructure and government) which also referenced to other literatures. For instance, financial perspective could be an interesting addition to be tested along with income distribution. It shall provide further insights of how country's set of capabilities behave towards investments and income distributions.

Not only adding more capability variables, but further study on capabilities variables can also be done. Each variable of human infrastructure and government can be further added with other strong indicators from reliable sources. It potentially provide stronger statistical assumption test and could also give more insights on the descriptive analysis.

The use of proxies in this research could also be a lesson in the future. It will be much more interesting if the use of quantitative data can be complemented with a provision of primary data which enable researcher to have comparison between generalized values with rather a specific case from a specific area or region.

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Annex 1:

Table 7: Description of indicators

Variable	Indicators	Unit	Source
Independent variable	Sectoral greenfield FDI inflow as % of GDP	Thousand USD	FDI markets
Dependent variable	Gini coefficient	Index	Euromonitor Passport/World Income Inequality Database
Human Capability	Life expectancy at birth	Years	United nation Development program
	Enrollment in tertiary education	Ratio	World Bank
	Gross National Income	Thousand USD	World Bank
Infrastructure Capability	Mobile subscriptions	Number	World Bank
	Internet usage	Ratio	World bank
	Air freight volume	Number	World Bank
Government Capability	Education expenditure	% of GDP	Euromonitor Passport
	Corruption index	(0= highly non transparent, 10= highly transparent) weighted average	Transparency International
Control variables	Total trades	% of GDP	Euromonitor passport
	Initial per capita GDP growth	% of GDP	Euromonitor Passport
	Initial Gini coefficient	Index	Euromonitor passport
	Population	Number	Euromonitor passport
	Country land area	Square kilometer	Food and Agriculture Organization

Table 8: Gini Index ASEAN-8 (DV)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	32.0	32.0	36.0	33.0	36.0	35.0	37.0	38.0	41.0	41.0
Malaysia	46.2	46.2	45.1	44.4	44.1	44.1	44.1	43.8	43.5	43.1
Philippines	48.7	47.5	46.4	45.8	45.8	46.0	46.4	46.6	46.5	46.1
Singapore	45.7	46.0	46.5	47.0	48.2	47.4	47.1	47.2	47.3	47.8
Thailand	46.0	46.0	45.9	45.6	46.4	47.2	46.7	46.2	46.1	46.0
Vietnam	41.8	42.0	43.0	44.4	43.3	42.3	42.4	42.5	43.3	44.0
Cambodia	35.8	35.5	37.4	39.3	41.1	35.1	34.0	32.9	31.8	30.8

Laos	35.1	35.5	35.9	36.3	36.6	36.9	37.1	37.4	37.6	37.9

Source: Author, 2017, from Euro Monitor Passport.

Table 9: Inward Greenfield FDI Agriculture of ASEAN-8 (Thousand USD) (IV)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	206.0	158.7	216.0	1315.8	378.0	441.7	1411.6	1397.1	661.0	705.1
Malaysia	83.5	226.2	45.4	50.1	213.2	1380.7	428.5	339.2	153.4	70.2
Philippines	482.4	120.2	67.1	178.3	860.7	331.0	470.9	268.3	97.9	63.6
Singapore	5173.5	5173.5	5173.5	5173.5	5173.5	5173.5	5173.5	5173.5	5173.5	5173.5
Thailand	252.2	207.5	164.8	29.0	144.8	431.7	415.0	235.3	261.9	104.2
Vietnam	248.2	200.5	288.2	183.8	233.8	413.3	398.7	358.8	532.5	234.8
Cambodia	0.0	0.0	0.0	43.6	60.2	47.5	33.2	0.0	41.6	98.8
Laos	0.0	0.0	0.0	89.6	7.0	66.3	0.0	51.4	0.0	15.9

Source: Author, 2017, from FDI Markets

Table 10: Inward Greenfield FDI Manufacturing of ASEAN-8 (Thousand USD) (IV)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	5065.1	3061.0	3220.2	6517.9	7578.4	13922.8	6551.4	8154.7	10260.5	11915.0
Malaysia	4665.8	2358.8	2472.9	2489.2	3939.7	7739.1	4582.9	9004.8	7682.7	3974.2
Philippines	890.5	1280.9	1274.2	795.2	2920.3	3401.8	1494.8	2186.7	1441.4	1888.8
Singapore	3188.0	3664.1	1815.4	3461.1	2470.2	3304.4	2224.1	4765.6	5589.4	2083.1
Thailand	6228.4	3917.7	3269.7	3122.1	3737.6	8978.0	4709.3	7282.1	2933.6	4357.5
Vietnam	4734.4	4295.1	4773.1	7427.1	14376.9	16493.0	7488.7	4690.3	5409.9	3368.1
Cambodia	53.4	54.5	79.0	1093.2	102.2	1227.9	2516.2	271.1	1260.8	440.4
Laos	1.9	22.0	421.5	494.7	45.0	184.0	656.9	180.6	142.0	163.6

Source: Author, 2017, from FDI Markets.

Table 11: Inward Greenfield FDI Service of ASEAN-8 (Thousand USD) (IV)

Country	2003.0	2004.0	2005.0	2006.0	2007.0	2008.0	2009.0	2010.0	2011.0	2012.0
Indonesia	262.7	465.9	794.1	1131.9	1028.3	1720.6	2235.7	1365.4	2436.1	1831.4
Malaysia	1152.6	1349.2	592.6	1266.6	1262.5	2683.2	2560.0	1820.5	2427.8	3317.0
Philippines	872.4	1163.2	1088.9	1196.9	980.1	1459.7	1355.2	1474.8	1098.0	1137.3
Singapore	2257.6	2782.0	3374.1	3801.8	4616.3	6182.3	6041.0	6539.9	7923.5	6758.3
Thailand	1081.1	648.2	1173.7	622.0	695.1	1134.6	770.5	1318.3	946.5	1659.9
Vietnam	1168.6	1563.2	3431.5	2728.1	2964.3	5052.9	3274.1	2942.8	2714.6	2714.5
Cambodia	51.8	150.4	150.0	44.7	106.7	1158.1	976.5	973.9	919.9	833.5
Laos	34.8	0.0	4.7	43.6	6.5	257.0	327.7	110.2	306.4	307.1

Source: Author, 2017, from FDI Markets.

Table 12: Gross National Income of ASEAN-8 (Human Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	900	1080	1220	1370	1600	1940	2140	2520	3000	3570
Malaysia	4160	4740	5280	5850	6780	7550	7550	8240	9040	10150
Philippines	1260	1400	1520	1650	1890	2230	2470	2730	2620	2980
Singapore	23110	25650	28370	32080	35660	36680	37080	44790	48150	51110

Thailand	2180	2530	2790	3100	3530	3980	4140	4580	4950	5520
Vietnam	510	590	680	760	850	1000	1120	1270	1390	1550
Cambodia	350	400	460	520	590	670	700	750	810	880
Laos	340	390	460	510	620	750	890	1000	1120	1350

Source: Author, 2017, from World Bank Indicators.

Table 13: Life Expectancy at Birth (Human Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	66.8	67.0	67.2	67.4	67.6	67.8	68.0	68.1	68.3	78.2
Malaysia	73.3	73.4	73.6	73.7	73.8	73.9	74.0	74.1	74.3	67.5
Philippines	67.0	67.1	67.2	67.4	67.5	67.5	67.6	67.7	67.8	68.5
Singapore	79.4	79.8	80.2	80.6	81.0	81.4	81.7	82.0	82.3	65.3
Thailand	71.4	71.8	72.2	72.5	72.9	73.2	73.5	73.7	73.9	74.4
Vietnam	73.9	74.1	74.3	74.4	74.6	74.8	75.0	75.1	75.3	65.5
Cambodia	61.2	62.2	63.1	63.9	64.7	65.4	66.0	66.5	67.0	67.9
Laos	60.6	61.2	61.8	62.3	62.9	63.4	63.9	64.4	64.9	82.5

Source: Author, 2017, from United Nation Human Development

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Table 14: Tertiary Enrollment Rates (Human Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	16.2	16.8	17.3	17.3	18.1	21.2	23.7	24.6	26.5	30.6
Malaysia	29.1	28.2	26.1	27.0	28.5	32.5	35.2	37.3	36.3	37.8
Philippines	28.4	27.4	28.6	29.2	29.0	28.8	28.0	29.1	30.4	30.9
Singapore	31.1	31.0	32.5	33.3	32.0	31.4	32.1	31.6	31.4	31.1
Thailand	41.1	42.1	44.6	45.0	49.3	49.1	50.0	51.2	53.4	52.4
Vietnam	10.0	12.9	15.8	16.5	18.2	18.7	19.8	22.4	24.6	25.1
Cambodia	2.7	2.7	3.4	5.8	7.7	9.7	12.1	13.8	15.1	15.8
Laos	5.0	5.8	7.9	9.1	11.6	13.3	16.3	16.4	16.9	16.7

Source: Author, 2017, from Euro Monitor Passport

Table 15: Internet User Rate (Infrastructure Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	2.4	2.6	3.6	4.8	5.8	7.9	6.9	10.9	12.3	14.5
Malaysia	35.0	42.3	48.6	51.6	55.7	55.8	55.9	56.3	61.0	65.8
Philippines	4.9	5.2	5.4	5.7	6.0	6.2	9.0	25.0	29.0	36.2
Singapore	53.8	62.0	61.0	59.0	69.9	69.0	69.0	71.0	71.0	72.0
Thailand	9.3	10.7	15.0	17.2	20.0	18.2	20.1	22.4	23.7	26.5
Vietnam	3.8	7.6	12.7	17.3	20.8	23.9	26.6	30.7	35.1	39.5
Cambodia	0.3	0.3	0.3	0.5	0.5	0.5	0.5	1.3	3.1	4.9
Laos	0.3	0.4	0.9	1.2	1.6	3.6	6.0	7.0	9.0	10.7

Source: Author, 2017, From World Bank Indicators

Table 16: Mobile Subscription (Infrastructure Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	18495251	30336607	46909972	63803015	93386881	140578243	163676961	211290235	249805619	281963665
Malaysia	11124000	14611000	19545000	19463722	23347000	27713000	30144000	33858700	36661300	41324700
Philippines	22509560	32935875	34778995	42868911	57344815	68117167	75586646	83150138	94189795	101978345
Singapore	3577000	3990700	4384600	4788600	5924100	6414800	6884800	7384600	7794300	8067600
Thailand	21616910	26965548	30460238	40125470	52973994	61837164	65952313	71726300	77449000	85012000
Vietnam	2742000	4960000	9593200	18892480	45024048	74872310	98223980	111570201	127318045	131673724
Cambodia	498388	861500	1062000	1721650	2583318	4237000	6268000	8150764	13757000	19105115
Laos	112275	204191	657528	1009565	1478409	2022133	3234642	4003395	5480851	4300000

Source: Author, 2017, From World Bank Indicators

Table 17: Air Freight Volume (Infrastructure Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	155609	318488	320724	357414	357789	345240	330112	520932	599692	641182
Malaysia	166716	170054	176152	163665	185052	176549	182002	302185	336401	343382
Philippines	56235	56647	58944	61712	65212	72333	87028	205318	225790	241699
Singapore	64117	76253	77119	84747	87564	91387	83772	131722	144697	157939
Thailand	93576	128178	124347	126845	129703	125907	123541	201306	227322	252369
Vietnam	41996	50855	54415	50840	60218	74739	83720	109176	135906	135300
Cambodia	4512	3893	3207	3998	4324	3667	3304	5105	7191	7432
Laos	7068	8413	9002	9959	9957	10007	9793	11374	12262	15836

Source: Author, 2017, From World Bank Indicators

Table 18: Corruption Index (Government Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	1.9	2.0	2.2	2.4	2.3	2.6	2.8	2.8	3.0	3.2
Malaysia	5.2	5.0	5.1	5.0	5.1	5.1	4.5	4.4	4.3	4.9
Philippines	2.5	2.6	2.5	2.5	2.5	2.3	2.4	2.4	2.6	3.4
Singapore	9.4	9.3	9.4	9.4	9.3	9.2	9.2	9.3	9.2	8.7
Thailand	3.3	3.6	3.8	3.6	3.3	3.5	3.4	3.5	3.4	3.7
Vietnam	2.4	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.9	3.1
Cambodia			2.3	2.1	2.0	1.8	2.0	2.1	2.1	2.2
Laos			3.3	2.6	1.9	2.0	2.0	2.1	2.2	2.1

Source: Author, 2017, From Transparency International

Table 19: Education Expenditure % GDP (Government Capability)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Indonesia	3.22	2.74	2.88		3.04	2.90	3.52	2.81	3.19	3.41
Malaysia	7.50	5.92		4.48	4.37	3.96	5.97	4.97	5.76	5.74
Philippines	3.04	2.57	2.43	2.53	2.60	2.69	2.65			
Singapore	4.00	3.68	3.22	2.87	2.96	2.78	3.03	3.11	3.08	3.12
Thailand	3.72	4.03	3.94	4.05	3.60	3.51	3.87	3.51	4.81	4.56
Vietnam						4.87	4.81	5.13	4.81	5.53
Cambodia		1.72			1.60		1.66	1.54	1.51	1.56

Figure 27: FDI manufacturing to Gini index in Government capability

	(1)	(2)	(3)	(4)
VARIABLES	GINI	GINI	GINI	GINI
sq_FDIM	0.0386	-0.0485	-0.210***	-0.225***
	(0.05)	(0.08)	(0.07)	(0.08)
log_CorrIndex	7.603***	-0.619	-0.167	0.189
	(2.75)	(2.13)	(0.96)	(0.98)
c.sq_FDIM#c.log_CorrIndex	-0.0266	0.102**	0.0639***	0.0633**
	(0.05)	(0.05)	(0.02)	(0.03)
log_EducationExpGDP		0.848***	-0.112	-0.191
		(0.14)	(0.11)	(0.14)
c.sq_FDIM#c.log_EducationExpGDP		-0.00910***	0.00925***	0.0102***
		(0.00)	(0.00)	(0.00)
Gini03			0.778***	0.844***
			(0.06)	(0.11)
GDP03			-0.0808	0.0384
			(0.24)	(0.28)
LandArea				9.19e-06
				(0.00)
Constant	32.81***	36.09***	12.20***	8.839**
	(2.79)	(2.32)	(2.08)	(4.17)
Observations	76	73	73	73
Number of year	10	10	10	10
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Figure 28: FDI agriculture to Gini index in Government capability

	(1)	(2)	(3)	(4)
VARIABLES	GINI	GINI	GINI	GINI
log_FDIAgri	1.710***	3.259	-1.946	-2.082
	(0.61)	(2.11)	(1.22)	(1.29)
log_CorrIndex	16.33***	8.139	-1.159	-1.677
	(2.39)	(7.01)	(2.22)	(2.37)
c.log_FDIAgri#c.log_CorrIndex	-1.463***	-0.568	0.554	0.641
	(0.36)	(1.13)	(0.39)	(0.41)
log_EducationExpGDP		1.522***	-0.398	-0.426
		(0.50)	(0.42)	(0.44)
c.log_FDIAgri#c.log_EducationExpGDP		-0.282***	0.122	0.125
		(0.09)	(0.09)	(0.09)
Gini03			0.753***	0.784***
			(0.08)	(0.09)
GDP03			0.0220	0.0883
			(0.31)	(0.32)
LandArea				4.17e-06
				(0.00)
Constant	23.91***	20.12**	15.37***	14.37***
	(3.55)	(9.13)	(4.68)	(4.81)
Observations	71	69	69	69
Number of year	10	10	10	10
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Figure 29: FDI service to Gini index in Infrastructure capability

	(1)	(2)	(3)	(4)	(5)
VARIABLES	GINI	GINI	GINI	GINI	GINI
sq_FDIServ	0.646***	0.270*	0.418	0.0526	-0.754***
	(0.13)	(0.16)	(0.37)	(0.40)	(0.24)
log_MobileSubs	1.345***	0.852	0.978	0.743	0.0551
	(0.30)	(0.93)	(1.11)	(1.07)	(0.50)
c.sq_FDIServ#c.log_MobileSubs	-0.0331***	-0.0219	-0.0171	-0.00183	0.00560
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
log_InternUsage		1.371	1.037	1.349	0.794*
		(0.86)	(1.47)	(1.33)	(0.48)
c.sq_FDIServ#c.log_InternUsage		0.0263	0.0431	0.0164	-0.0375
		(0.03)	(0.05)	(0.05)	(0.02)
log_FreiVol			0.399	0.258	-1.411***
			(1.70)	(1.46)	(0.42)
c.sq_FDIServ#c.log_FreiVol			-0.0252	-0.0107	0.0687***
			(0.04)	(0.04)	(0.02)
GDP03				0.110	-0.0852
				(0.12)	(0.25)
Trade				0.0164***	0.0154**
				(0.00)	(0.01)
Gini03					0.709***
					(0.04)
Constant	16.50***	25.48**	20.15	22.48	22.97***
	(4.57)	(12.68)	(20.95)	(19.12)	(7.92)
Observations	80	80	80	80	80
Number of year	10	10	10	10	10
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Figure 30: FDI manufacturing to Gini index in Human capability

	(1)	(2)	(3)	(4)	(5)
VARIABLES	GINI	GINI	GINI	GINI	GINI
sq_FDIM	-0.159*	-0.300	-0.549**	-0.268***	-0.254**
	(0.09)	(0.21)	(0.24)	(0.10)	(0.10)
log_GNI	-0.806	-0.513	-0.929	-0.0971	-0.0966
	(0.63)	(0.59)	(0.85)	(0.23)	(0.22)
c.sq_FDIM#c.log_GNI	0.00941*	0.00932**	0.00659	0.0104***	0.0106***
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
LifeExp		-0.000493	-0.251	0.0606	0.0659
		(0.11)	(0.20)	(0.05)	(0.05)
c.sq_FDIM#c.LifeExp		0.00186	0.00752**	4.57e-05	-0.000152
		(0.00)	(0.00)	(0.00)	(0.00)
TerEnrollment			0.483***	-0.0946	-0.0908
			(0.18)	(0.11)	(0.12)
c.sq_FDIM#c.TerEnrollment			-0.00456*	0.00292*	0.00294*
			(0.00)	(0.00)	(0.00)
Gini03				0.829***	0.809***
				(0.10)	(0.16)
GDP03				-0.513***	-0.561**
				(0.18)	(0.23)
LandArea					-3.42e-06
					(0.00)
Trade				0.0110***	0.0106***
				(0.00)	(0.00)
Constant	55.32***	50.86***	64.35***	8.869*	9.601
	(10.31)	(15.38)	(20.55)	(5.09)	(6.78)
Observations	80	80	80	80	80
Number of CountryID	8	8	8	8	8
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Figure 31: FDI service to Gini index using Human capability

	(1)	(2)	(3)	(4)	(5)
VARIABLES	GINI	GINI	GINI	GINI	GINI
sq_FDIServ	-0.446***	-0.123	-0.561***	-0.361***	-0.351***
	(0.06)	(0.18)	(0.19)	(0.14)	(0.13)
log_GNI	-2.394***	-2.097***	-1.784***	-0.147	0.0990
	(0.17)	(0.24)	(0.19)	(0.29)	(0.28)
c.sq_FDIServ#c.log_GNI	0.0348***	0.0290***	0.0276***	0.0113**	0.0132***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
LifeExp		0.321**	-0.0665	0.116*	0.0631
		(0.13)	(0.07)	(0.06)	(0.10)
c.sq_FDIServ#c.LifeExp		-0.00375**	0.00270	0.000766	-0.000207
		(0.00)	(0.00)	(0.00)	(0.00)
TerEnrollment			0.186***	-0.106*	-0.0633
			(0.05)	(0.06)	(0.06)
c.sq_FDIServ#c.TerEnrollment			-0.000336	0.00539***	0.00494***
			(0.00)	(0.00)	(0.00)
Gini03				0.719***	0.743***
				(0.04)	(0.06)
GDP03				-0.466	-0.630*
				(0.30)	(0.37)
LandArea					-3.80e-06
					(0.00)
Trade					0.0153***
					(0.00)
Constant	77.70***	51.68***	69.08***	10.83	8.710
	(2.67)	(11.30)	(6.68)	(8.88)	(10.65)
Observations	80	80	80	80	80
Number of year	10	10	10	10	10
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Figure 32: FDI agriculture to Gini index using Infrastructure capability

	(1)	(2)	(3)	(4)	(5)
VARIABLES	GINI	GINI	GINI	GINI	GINI
log_FDIAgri	18.66***	8.503***	11.47***	9.587***	-7.664*
	(3.87)	(2.58)	(3.02)	(3.00)	(4.53)
log_MobileSubs	6.488***	2.959**	-3.517**	-3.918***	-3.701***
	(1.51)	(1.40)	(1.49)	(1.41)	(1.15)
c.log_FDIAgri#c.log_MobileSubs	-1.103***	-0.531***	0.763***	0.897***	0.698***
	(0.24)	(0.20)	(0.23)	(0.24)	(0.21)
log_InternUsage		1.483	-4.089	-3.431	-1.228
		(1.72)	(2.62)	(3.03)	(1.86)
c.log_FDIAgri#c.log_InternUsage		0.0759	1.100***	0.919*	0.165
		(0.30)	(0.40)	(0.52)	(0.37)
log_FreiVol			11.76***	11.61***	2.694
			(2.18)	(2.17)	(2.37)
c.log_FDIAgri#c.log_FreiVol			-2.387***	-2.397***	-0.358
			(0.29)	(0.27)	(0.44)
GDP03				-0.295*	0.137
				(0.18)	(0.28)
Trade				0.0103	0.0129***
				(0.01)	(0.00)
Gini03					0.734***
					(0.08)
Constant	-66.97***	-9.617	-20.96	-12.65	41.19*
	(24.37)	(18.81)	(18.90)	(19.79)	(22.76)
Observations	71	71	71	71	71
Number of year	10	10	10	10	10
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Figure 33: FDI agriculture to Gini index using Human capability

	(1)	(2)	(3)	(4)	(5)
VARIABLES	GINI	GINI	GINI	GINI	GINI
log_FDIAgri	-3.104*	2.150	3.333	-3.344	-4.535***
	(1.78)	(4.08)	(2.25)	(2.15)	(1.46)
log_GNI	-2.411***	-2.048**	-0.589	-0.194	-0.464
	(0.77)	(0.88)	(0.81)	(0.58)	(0.54)
c.log_FDIAgri#c.log_GNI	0.255**	0.201	-0.00320	0.0905	0.199**
	(0.12)	(0.14)	(0.12)	(0.09)	(0.09)
LifeExp		0.593**	0.245	0.0716	0.0890
		(0.30)	(0.16)	(0.14)	(0.10)
c.log_FDIAgri#c.LifeExp		-0.0654*	-0.0212	0.00691	-0.0140
		(0.04)	(0.02)	(0.03)	(0.01)
TerEnrollment			0.411**	-0.285**	-0.327*
			(0.18)	(0.14)	(0.17)
c.log_FDIAgri#c.TerEnrollment			-0.0507	0.0649**	0.0807**
			(0.03)	(0.03)	(0.03)
Gini03				0.771***	0.768***
				(0.06)	(0.09)
GDP03				-0.317	-0.677
				(0.38)	(0.47)
LandArea					-6.13e-06
					(0.00)
Trade					0.0180***
					(0.00)
Constant	76.96***	30.47	22.14	15.20	21.98**
	(11.42)	(29.94)	(14.96)	(13.55)	(9.95)
Observations	71	71	71	71	71
Number of year	10	10	10	10	10
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Figure 34: FDI service to Gini index using Government capability

	(1)	(2)	(3)	(4)
VARIABLES	GINI	GINI	GINI	GINI
sq_FDIServ	0.197***	0.188	-0.313***	-0.362***
	(0.04)	(0.16)	(0.05)	(0.05)
log_CorrIndex	11.93***	10.76***	-1.285	-1.966**
	(1.30)	(1.77)	(1.16)	(0.99)
c.sq_FDIServ#c.log_CorrIndex	-0.128***	-0.106*	0.101***	0.117***
	(0.02)	(0.06)	(0.03)	(0.02)
log_EducationExpGDP		0.197	-0.114	-0.394**
		(0.15)	(0.13)	(0.16)
c.sq_FDIServ#c.log_EducationExpGDP		-0.00326	0.0131***	0.0175***
		(0.00)	(0.00)	(0.00)
Gini03			0.757***	0.934***
			(0.05)	(0.05)
GDP03			-0.00936	0.240
			(0.24)	(0.20)
LandArea				2.54e-05***
				(0.00)
Constant	27.08***	26.99***	14.17***	6.874**
	(1.59)	(3.18)	(2.96)	(3.15)
Observations	76	73	73	73
Number of year	10	10	10	10
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Figure 35: FDI manufacturing to Gini index using Infrastructure capability

	(1)	(2)	(3)	(4)	(5)
VARIABLES	GINI	GINI	GINI	GINI	GINI
sq_FDIM	0.739***	0.395***	0.604***	0.541***	-0.463***
	(0.14)	(0.11)	(0.13)	(0.13)	(0.18)
log_MobileSubs	2.225***	1.882***	0.436	0.712	-1.250*
	(0.35)	(0.65)	(0.91)	(0.75)	(0.65)
c.sq_FDIM#c.log_MobileSubs	-0.0421***	-0.0302***	-0.00126	0.00354	0.0267**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
log_InternUsage		0.173	-0.975*	-1.473**	1.158*
		(0.65)	(0.52)	(0.66)	(0.68)
c.sq_FDIM#c.log_InternUsage		0.0407***	0.0533***	0.0519***	-0.0267**
		(0.01)	(0.01)	(0.01)	(0.01)
log_FreiVol			4.001***	4.048***	0.0399
			(1.09)	(0.90)	(0.85)
c.sq_FDIM#c.log_FreiVol			-0.0665***	-0.0684***	0.00734
			(0.01)	(0.01)	(0.01)
GDP03				-0.135	0.111
				(0.24)	(0.16)
Trade				0.0103***	0.0115***
				(0.00)	(0.00)
Gini03					0.818***
					(0.08)
Constant	4.230	10.99	-4.962	-9.330	22.80***
	(5.80)	(8.41)	(7.03)	(8.25)	(8.78)
Observations	80	80	80	80	80
Number of year	10	10	10	10	10
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					