The Impact of Indonesia-Japan Economic Partnership Agreement (IJEPA) on Indonesia's Trade Flow

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Atrifia Aulia
(Indonesia)

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Members of the Examining Committee:
Dr. Elissaios Papyrakis
Dr. Sunil Tankha

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Inquiries:

International Institute of Social Studies
P.O. Box 29776
2502 LT The Hague
The Netherlands

t: +31 70 426 0460
e: info@iss.nl
w: www.iss.nl
fb: http://www.facebook.com/iss.nl
twitter: @issnl

Location:

Kortenaerkade 12
2518 AX The Hague
The Netherlands

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List of Acronyms

ACFTA	ASEAN-China FTA
AFTA	ASEAN Free Trade Agreement
ASEAN	Association of Southeast Asian Nations
CGE	Computable General Equilibrium
CPEC	China-Pakistan Economic Corridor
EEA	European Economic Area
FEM	Fixed Effect Model
FTA	Free Trade Agreement
GATT`	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
IJEPA	Indonesia-Japan Economic Partnership
IMF	International Monetary Fund
REM	Random Effect Model
NAFTA	North America Free Trade Agreement
WTO	World Trade Organization

Abstract

Trade liberalization is a practice of international trade policy where countries agree to trade with less or no barrier. As trade liberalization practices expand in the last decade, countries started to sign multilateral and bilateral agreements to widen their respective international markets. However, pros and cons arise as more developing countries are signing Free Trade Agreement (FTA) with developed countries. Supporters of FTA are confident that the agreement will bring benefits and increase developing countries' growth, while cynics are certain that it will benefit wealthier country more. Using augmented gravity model, this research examines whether the implementation of Indonesia-Japan Economic Partnership (IJEPA) affects Indonesia's trade flow. With high confidentiality, the results show that IJEPA increased Indonesia's exports and imports, although exports growth is slower than imports growth after the implementation. Moreover, this study also finds that the practice of IJEPA gives a rather negative impact on Indonesia's trade balance, albeit low significance level of results.

Relevance to Development Studies

Trade agreements between developed and developing countries have become a point of opposing arguments for years, with one side claiming exceptional economic growth for the latter while the others saying it only benefited the wealthier countries. Given that the study aims to examine whether trade agreement between Indonesia and Japan, the IJEPA, benefited Indonesia's trade flow and whether it resulted in more advantages for Indonesia than Japan, it may enrich ongoing discussions by presenting evidence of the trade policy's effects. Furthermore, there are still very limited studies about the impact of the subject bilateral agreement, especially using gravity model, making this research a good reference for further study on this issue. Finally, this study also tries to identify sectors that were affected the most by changes in tariffs, providing governments and/or interested parties a guide in evaluating and constructing further trade-related policies.

Keywords

Trade Liberalization, Free Trade Agreement, Bilateral Trade, Trade Flow, Indonesia-Japan Economic Partnership Agreement, Indonesia, Japan

Chapter 1: Introduction

1.1 Background of the Study

This section is divided into two subsections: conceptual background and problem background. The first explains trade liberalization as main concept used in this research, while the second discusses the conditions of the countries, the agreement and the problem behind this research.

1.1.1. Conceptual Background: Trade Liberalization

Trade between countries, or international trade, happens when countries want to maximize their benefit by exporting product that they can produce efficiently and importing the rest. In doing so, each country can apply their own trade policies such as tariffs, quota limitation, embargo, etc. In modern economy, most international trade happens in the scheme of trade liberalization where there is less to none barrier for trade between countries. The World Bank defined trade liberalization as "any act that would make the trade regime more neutral – nearer to a trade system free of government intervention" (as cited in Shafaeddin 2005: 3). Another definition by Hilman (2008) described trade liberalization by comparing it to practice of protectionism. In joining international trade, a country can choose whether to use trade protectionism or trade liberalization as their policy. While trade protectionism is used for minimizing imports by increasing tariffs, setting import quotas or giving subsidies to local industry, trade liberalization is a policy where governments decide to move toward free trade practice by eliminating barriers and restrictions on international trade for both imports and exports (Hilman 2008).

Trade liberalization was not a popular choice in 1950-1970 where many governments implement import substitution and protection to let their local industries grow, just like how Indonesia implemented high import tariffs and heavy non-trade barriers between 1970s-1980s to support their industrialisation program (Wong and Chan 2003; Basri and Hill 2004). The year of 1994 then marked a wide leap for trade liberalization practice with 123 countries signing the General Agreement on Tariffs and Trade (GATT) at the Uruguay Round, and the establishment of World Trade Organization (WTO) on 1 January 1995. With 164 countries currently listed as members, WTO's main activity is to facilitate trade barriers elimination and reduction to encourage its members in implementing trade liberalization through bilateral and multilateral trade agreements (George 2010).

One form of trade liberalization is Free Trade Agreement (FTA) where governments of two (bilateral) or more (multilateral) countries agreed to reduce and/or eliminate tariff and non-tariff barriers in goods and services transaction between members (Wong and Chan 2003; George 2010). While trade liberalization is more about political direction chosen by the government, free trade agreement is one way of implementing it (George 2010: 115).

1.1.2 Problem Background: FTA Practices in Indonesia

Indonesia has implemented open economy since the era of New Order in 1966. However, in 1973, Indonesia experienced a great nationalist resurgence caused by a sudden increase in international oil price, forcing the country to put sky-high tariffs on imported products and apply various types of non-tariff barriers to push domestic industrialisation. At this time, tariffs rose from less than two percent to more than 20 percent in two years (1974-1976) and continued to fluctuate between five to 15

percent until early 80s. It was around mid-1980s when oil prices continued to fall, triggering the Indonesian government to start major trade reforms by decreasing import tariffs and opening bigger gate for foreign investments (Basri and Hill 2004).

After fully re-implementing open economy, Indonesia has signed numerous bilateral and multilateral agreements in both trade- and nontrade-related treaties. These agreements are believed to give positive impact toward development in Indonesia. Its first international trade agreement is Association of Southeast Asian Nations (ASEAN) Free Trade Agreement or AFTA in 1993, followed by numerous intra-regional trade agreements between ASEAN and other countries/regions such as the ASEAN-China FTA (ACFTA), ASEAN-Korea FTA, to name a few. While there were a lot of multilateral agreements forged, the first bilateral agreement signed by Indonesia is Indonesia-Japan Economic Partnership Agreement (IJEPA). Although the agreement does not only cover trade treaty between the parties, its first of eight objectives is to "facilitate, promote and liberalize trade in goods and services between the Parties" (Agreement between Japan and the Republic of Indonesia for an Economic Partnership 2007: 10). In order to achieve that objective, IJEPA aims to reduce and eliminate tariffs of more than 90 percent classifications of exported and imported goods with several schedule classification, as described in table 1:

Table 1. IJEPA Tariffs Elimination Classification

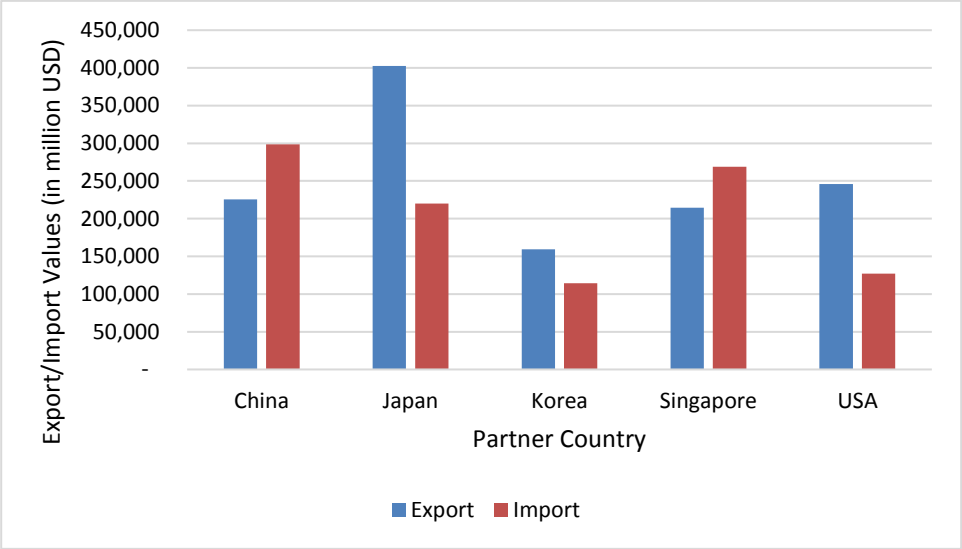
Classification	Tariffs Elimination Schedule
A	Eliminated from the beginning of agreement implementation
B3	Eliminated in four equal annual instalments from base rate[1] to free
B5	Eliminated in six equal annual instalments from base rate to free
B7	Eliminated in eight equal annual instalments from base rate to free
B10	Eliminated in eleven equal annual instalments from base rate to free
B15	Eliminated in sixteen equal annual instalments from base rate to free
P	Eliminated with separate terms and conditions depends on each party's schedule
Q	Eliminated with separate terms and conditions depends on Japan's schedule
R	Eliminated with negotiations between parties
X	Excluded from tariffs reduction and elimination

Source: Government of Indonesia and Government of Japan (2007)

Originally, Japan has always been Indonesia's main export destination having the highest export values compared to other developed countries, while their import is slightly under China and Singapore (see chart 1). Main exported products from Indonesia are mainly raw materials (mineral fuels, oils, and ores), while the main imported products from Japan are machinery and vehicles (United Nations Trade Statistics 2018). With the implementation of IJEPA, both export and import flow between Indonesia and Japan are expected to have significant increase as there are less boundaries to enter each other's market.

[1] Base rate is "starting point of equal annual installments of elimination of customs duties" (Government of Indonesia and Government of Japan 2007: 114)

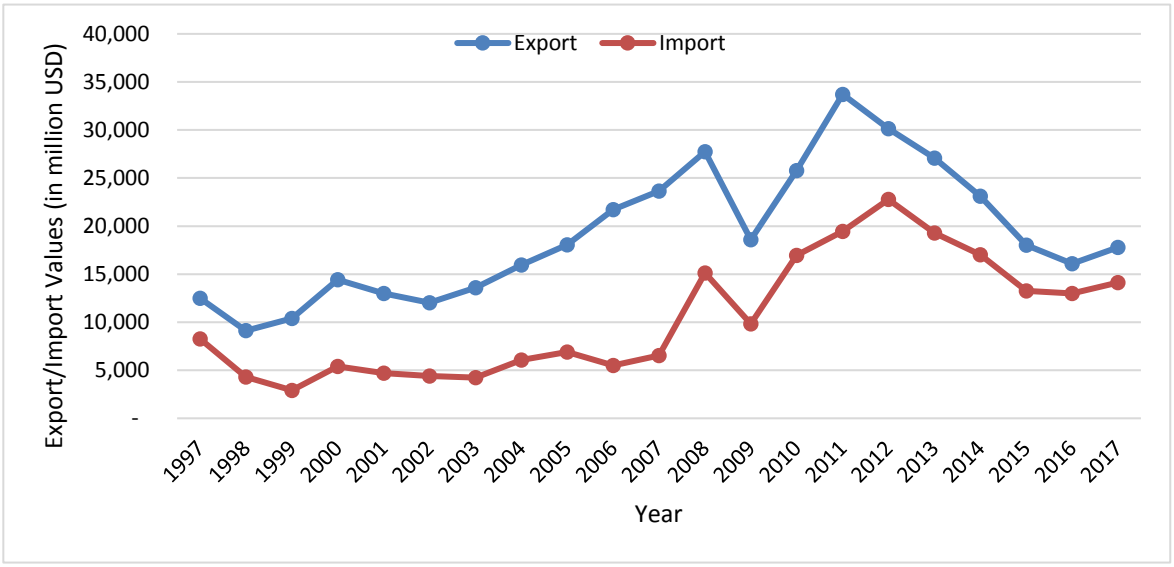
Chart 1. Indonesia's Main Export Destinations (Advanced Economies)



Data source: United Nations Trade Statistics (2018)

With IJEPA implementation, the tariffs elimination scheme was supposed to boost export and import flows between the parties. However, as shown in chart 2, there were noticeable fluctuations, especially in export value, from 2007 to 2017. Since a lot of external factors affect these fluctuations including trade collapse in 2008-2009 and the declining raw commodities demand from 2012 onwards, it is not possible to deduce IJEPA's effect just by looking at changes in these numbers.

Chart 2. Indonesia´s Export and Import from and to Japan



Data source: United Nations Trade Statistics (2018)

This agreement also raised controversy as the public believed Indonesia would not get as much advantages as Japan from this pact since the latter dominates the former in many sectors. Although there are additional clauses in the agreement to make it evenly advantageous for both parties, such as

the capacity building program that obliges Japan to give adequate assistance for Indonesian local industry to increase their competitiveness in Japanese market, there are still doubts on whether this agreement is beneficial to Indonesia as much as it is to Japan (Mahendra 2015). Hence, this research aims to find out how significant is the effect on Indonesia´s export of IJEPA implementation, especially elimination of tariffs, and how it fares to the changes in imports flow.

1.2 Research Objective

The main objective of this research is to evaluate whether being involved in trade agreement with more advanced economy such as Japan give more advantages toward Indonesia's trade activity. Based on this main objective, this research starts by comparing trade performance before and after the agreement to determine IJEPA's degree of impact on Indonesia's export and import values separately. Furthermore, this study evaluates the impact of IJEPA on Indonesia's trade balance by examining whether the agreement increases or decreases the trade balance, and see if it increases export flow as much as or more than it increases import flow. Consequently, this research identifies which product was affected the most, positively and negatively, by the agreement or by the changes in tariffs, and how much those sectors' export and import values fluctuate.

1.3 Research Question

In achieving objectives mentioned in subsection 1.2, the main research question in this study is: 'How has the implementation of IJEPA affected Indonesia's export and import flow?'; with the hypothesis that 'IJEPA's implementation gives positive impact towards Indonesia's export and import'.

In addition, the study also raises the following sub questions:

1. How does IJEPA affecting Indonesia's trade balance?
2. Which sector of exported and imported products experienced the largest increase with tariff changes?
3. Which sector of exported and imported products experienced the largest drop with tariff changes?

1.4 Contribution to the Literature

Despite having been implemented since 2008, there are still very limited literature that examines the impact of IJEPA towards Indonesia's and/or Japan's trade flow. In fact, there are no prior studies about IJEPA that used gravity model approach, one of the most famous model to analyse trade between countries. Therefore, this research tries to fill the gap by examining IJEPA effect on Indonesia's trade flow using augmented gravity model. However, while looking at prior studies as references for the regression model, the writer found out that there are also very limited studies that tackle bilateral agreement issue using gravity model. On the contrary, there are numerous studies examining multilateral agreement such as ASEAN-China Trade Agreements (ACFTA), North America Free Trade Agreement (NAFTA), or European Economic Area (EEA) agreement. Due to these limitations, this research needs to make adjustment to the model that is commonly used in multilateral agreement studies. The novelty of this research lies on how it developed a new model by making adjustment on the existing gravity model used in multilateral agreement studies and replaced country-specific variables such as distance and language to more sector-specific variables such as tariffs and quotas.

1.5 Organization of the Research Paper

The research is divided into five chapters. The next chapter explains literature review that discusses prior studies related to the topic such as studies that mentioned advantages and disadvantages of FTA practices in developing countries, studies about IJEPA, and studies about regression analysis and gravity model that explain the concept of the method used in this research.

Chapter 3 explains in-depth the data and methodology used in this research --- starting from data description, sources, and how these data were gathered and prepared for processing. This chapter also provides preliminary tests needed such as correlation and Hausman test to determine the most suitable method for the STATA regression. Lastly, this chapter describes the methodology, including how the gravity model was built and used to answer each research question, as well as the importance and justification of each variables used in the model.

Chapter 4 describes the result of regression using methodology in Chapter 3 and analyzes it in order to answer main and sub research question. This chapter also tries to connect the result with literature review from Chapter 2 to see whether the result resonates with conclusions from prior studies.

Chapter 5 as the last chapter presents the conclusion of this research with some implications and recommendations for future studies. This chapter also points out several limitations found from the result and how it can be a topic for future studies.

Chapter 2: Literature Review

This chapter discusses literatures that talk more broadly of the advantages and disadvantages of FTA toward developing countries. Secondly, this also provides reviews of prior studies that focused on bilateral agreement between Indonesia and Japan. Then, this chapter proceeds with talks about literature review on specific methodology called gravity model, which has been applied commonly to analyze bilateral and multilateral trade agreements. This explanation is also employed later in this study, specifically in influencing the selection of variables used in this research's regression model.

2.1 The Advantages of Free Trade Agreements

With easier access to international market, FTA is expected to give important boost for developing countries' economic growth by increasing production efficiency, optimizing quality through knowledge exchange, giving better access to technology, and stimulating innovation (Haberler 1950; Dornbusch 1992; Lee 2005). Firstly, a study by Romer (1989) presented a model to measure how country's openness affecting long-run economic growth in relation with productivity and specialization. When countries try to specialize in producing goods in which they possess comparative advantage, free trade reduces the cost to import intermediate inputs needed which will result in higher equilibrium growth (Romer 1989). Amiti and Konings (2007) examined the impact of tariffs reduction on final goods and intermediate inputs toward Indonesia's firm productivity. Using manufacture industry data from 1991 to 2001, the study found that the reduction of input tariffs has significant positive effect on productivity where a 10 percent decrease in tariffs can increase productivity by up to 12 percent. While for the non-importers, the effect is smaller where productivity will gain between one- and six-percent with 10 percent reduction in output tariffs. The study then concluded that a higher gain experienced by importing firms might be due to benefits from higher quality-lower price inputs, broader variation of inputs, and learning effects (Amiti and Konings 2007).

Secondly, similar to learning effects, free trade is also believed to facilitate foreign knowledge exchange between countries through trade activities. Freer trade allows countries with equal wealth to incorporate each other's production knowledge to their own production process and enable their product to compete in foreign market, thus, resulting in them gaining similar per capita output growths. Meanwhile, free trade between countries with different wealth creates knowledge spill overs from country with greater stocks in knowledge, or the wealthier one. This situation allows less wealthy country to learn production techniques from advance economies, stimulating innovation in local industries. In the long run, this country will experience higher growth effects compared to developed country (Romer 1989; David and Loewy 1998).

Baldwin and Gu (2004) wrote about how reduction of tariff barriers between Canada and other countries boosts the innovation in Canada's manufacturing plants. First, freer trade attracts more firms to enter the export market. By becoming exporters, they are more exposed to advanced foreign technologies which allow them to absorb new knowledge easier and stimulate the innovation process. Moreover, the result showed that exporters tend to invest more, or even collaborate with foreign partners in research and design (R&D) establishment as well as human resources capacity building in order to keep their business competitive in dynamic international market (Baldwin and Gu 2004).

However, none of these studies specifically examined the different scale of impact experienced by two countries with distinct size of economy as a result of the implementation of free trade. One

that made a specific comparison is a more recent study related to FTA impact on growth by Lee (2014). He compared results from several studies to measure the economic impact Korea experienced caused by trade agreement between them and the US, called the KORUS FTA, that have been implemented since 2012. While many opposed this agreement as US economy might overpower the Korean economy and give negative effects to local business, some also thought it will increase trade, investment and job opportunities in Korea. To prove one of these arguments, the study described five economic analyses that used Computable General Equilibrium (CGE) models and different tariffs reduction scenarios to predict the economic reaction. The result shows that 4 out of 5 analyses predicted that Korea will experience bigger gross domestic product (GDP) growth rate than US upon implementation of this agreement. Meanwhile, the last analysis predicted that there will be a decrease in economic welfare in Korea as well as trade deficit as a result of this agreement (Lee 2014). Nevertheless, the methodology used in this study cannot specify the strength of impact and significance brought by free trade towards GDP growth that can be solved using regression analysis.

A study on bilateral trade effect done by Chaudhry et al (2017) used regression analysis, in particularly gravity model, to examine the China-Pakistan Economic Corridor (CPEC) effect on Pakistan's fruit export. Pakistan is known for its fruit export that represents more than 10 percent of their total export values. Considering that fruit is a perishable goods and thus sensitive to distance, CPEC is expected to reduce this distance by eliminating trade barriers. The gravity equation used was developed by the authors themselves using data from 2013 to 2015. Independent variables used in this calculation are GDP, GDP per capita, production per capita, and trade agreement participation as dummy variables. The regression measured the impact brought by these variables toward the dependent variable, Pakistan's export values to China and other partner countries i.e. Arab Saudi and Singapore. The result shows negative coefficient with high significant level on variable D, which means distance plays an important role in perishable goods exports, with less distance stimulates more export; and the implementation of CPEC reduces the distance between Pakistan and China (Chaudhry et al. 2017). While the methodology used in this study already managed to measure the strength and significance level of free trade impact on export values, the writer believes that additional amount of observations will elevate the data quality. Since the space dimension is limited to export values from Pakistan to three countries, wider time range can be an alternative to increase the number of observations.

2.2 The Dark Side of Free Trade Agreement

Although more literatures discussed the advantages of FTA, several other literatures give counter arguments arguing that FTA brings more benefits for advance economies and less for developing countries. A study by Rose (2004) concluded that there is not enough reason to believe practice of trade liberalization brought by WTO give significant effect toward international trade. By using gravity model, the study showed that a dummy variable representing country's membership of WTO has statistically insignificant effect with negative coefficient. It means that although a particular country becomes a member of WTO that encourages practice of trade liberalization, there is not enough evidence to prove that its trade improved with the implementation of the policy (Rose 2004). As a critic to this study, Subramanian and Wei (2006) stated that free trade actually increased world's import by 120 percent. However, they also mentioned that this increase did not happen evenly where there is almost no benefit brought by free trade for developing countries' trade. Advance economies that are more involved in international trade negotiations experienced increase in trade multiple times over from developing countries that act as their trade partner (Subramanian and Wei 2006).

The next study by Ibrahim et al (2010) wrote that the implementation of ACFTA gives more advantage to China where their export to ASEAN market increased by more than 50 percent, rather than to smaller countries like Indonesia that experienced a decrease in their export to ASEAN market by 4.4 percent (Ibrahim et al. 2010). Aside from differences in wealth and size of the economy, infrastructures in Indonesia are highly inadequate with limited access to capital and big cities. As a comparison, World Economic Forum in 2010 reported Indonesia's infrastructure quality ranks 96 out of 133 countries, while China sits at top 20. Additionally, Indonesia has a very poor investment environment where its lending rate is almost three times that of China. Combined with Chinese low price-high intellectual work force, a chance for Indonesia to gain more advantage out of this agreement is almost not existing (Ibrahim et al. 2010; Ginting 2011).

Faber (2012) adds another argument against free trade with his study that discussed how trade liberalization increased income inequality between the rich and the poor in Mexico. He explained that the implementation of NAFTA reduces the price of inputs from US, which also reduces the price of high quality products in Mexico. Eventually, the rich households will increase their consumption on those products and the relative price effect will lead to significant economic disparities between rich and poor household and expansion of real income inequality in the country (Faber 2012).

2.3 Prior Studies about IJEPA Effect

Although many cited studies examined the effect of bilateral and multilateral agreements, there are still very limited literatures on the effect of Indonesia's bilateral trade, especially IJEPA. One study by Setiawan (2012) discussed specifically the IJEPA effect for Indonesia and Japan by examining export contribution toward national income and how this contribution increased with the implementation of IJEPA. It used time series data set with monthly exports actual data from January 1990 to June 2011 and simulation data without IJEPA scheme from 1 July 2008 to 30 June 2011. This analysis utilized Box-Jenkins methodology that is known to be compatible for research with forecasting. The result shows that Indonesia's export value increased by more than 14 percent with IJEPA scheme and nine percent without the agreement, while Japan's export value grow for 33.6 percent and 33.2 percent, respectively. With the numbers illustrate how the growth of export values differ between two conditions, this research concluded that IJEPA boosts export contribution on both Indonesian and Japanese national incomes, with the effect being much bigger for Indonesia (Setiawan 2012). However, the writer personally thinks that the trade data used for this research is very narrow given the time dimension limitation of only until 3 years after the agreement implementation.

A more recent study with bigger time dimension is by Hariyono (2015) that analysed IJEPA impact on member countries' trade and welfare using both qualitative and quantitative methodology. First, he used qualitative evaluation by comparing FTA's implementation with FTA Analysis criteria[2]

[2] The FTA Analysis criteria provided by Plummer (2010) using Viner's FTA analysis that focused on trade creation and trade division. There are 5 (five) criteria which are: (i) Trade creation indicated by increase in import from partner country and decrease in domestic production; (ii) Trade diversion indicated by increase in import from partner country and decrease in import from non-partner country; (iii) Positive welfare effect indicated by increase of total import with no trade diversion detected; (iv) Negative welfare effect where decreasing number of imports from non-partner countries is larger than the decrease of domestic production and positive welfare if the fall of domestic production is larger; (v) Negative welfare effect indicated by decrease of total import (Hariyono 2015: 7-8)

to determine whether or not it constructs trade creation[3] and trade diversion[4]. The analysis compared trade before and after IJEPA on chemical products, manufactured goods, and machinery and transport equipment. For Indonesia's case, imports from China and Korea are used as comparison with imports from Japan, while for Japan's case, import statistics from Indonesia are compared with those from selected ASEAN countries. The result of this qualitative analysis stated that there were barely any increases after the implementation of IJEPA on both Japanese and Indonesia's import statistics in specified products marked by no trade diversion from other partner countries even with the tariff reduction scheme. An analysis about these mentioned that Indonesia's product quality is less competitive compared to products from Malaysia, Thailand and Vietnam. Meanwhile, there were also rise in number of Japanese investment in Indonesia that automatically diverted imported goods to domestic products. The quantitative approach then analysed IJEPA effect towards members' welfare using three key features: trade volume, intra-union terms of trade and extra-union terms of trade. The result showed that both countries experienced positive changes in trade, therefore signifying rise in economic welfare for both countries in relevant products (Hariyono 2015).

Even though this study already filled the gap of previous study by using wider time dimension, unfortunately, it did not use regression analysis so it cannot identify how big and significant the impact of IJEPA implementation on both countries' trade values. In order to fulfil this gap, this research conducted a regression analysis study to examine IJEPA impact toward Indonesia's trade flow using 21-year time dimension from 1997 to 2017.

2.4 Regression Analysis, Gravity Model and Its Application

Montgomery et al (2012) mentioned regression analysis as "one of the most widely used techniques for analyzing multifactor data". It is very useful and broad since it combines both mathematics and statistical theory in examining relationship between a response variable with several independent predictor variables that are expected to have effect on that response variable (Montgomery et al. 2012: xiv). In doing economic analysis, including regression, there are three types of data that can be used: time series data, cross-sectional data and panel data. Time series data is where the values of variable differ over times while cross-sectional data varies over space. Panel data, which is the type of data that will be used in this research, is a combination of both data types where variable's values differ over time and space (Gujarati and Porter 2009: 22).

One type of regression analysis that is commonly used to measure trade effect is gravity model. First introduced by Tinbergen (1962) and Hans Linneman (1966), the name gravity model imitates Newton's law of gravitation where attraction between two objects relied on their masses and distance between their centers. Translating it into gravity model, the idea is that an amount of goods or services traded from one country to another depends on the size of demand and supply from each other reduced by distance between them (Anderson 2011). Throughout time, this model has been used extensively because of its ability to present empirical robustness and explanatory power when analyzing international trade flows. The main concept of gravity model equation is that trade between two parties, usually represented by import and/or export values, are explained by several

[3] Additional trade activities due to reduction of trade barriers between member countries (Yang and Martinez-Zarzoso 2014: 143).

[4] Shifting of imports from non-member countries with lower resource cost to member countries with higher cost due to preferential access to the market and elimination of tariffs (Yang and Martinez-Zarzoso 2014: 143).

characteristics between them such as GDP, distances, languages, and several specific dummy variables (Martinez-Zarzoso 2003). The common equation of this model in non-technical equation is as follow:

$$Trade\ Flow = GDP\ Per\ Capita + Population + Distance + Dummy\ Variables \ldots\ldots (1)$$

In this framework, GDP per capita and population are used to represent the overall economic development of each country, distance between two countries used for its relations to transportation cost and dummy variables related to relationship between two countries such as whether there are any colonial ties, use of the same language, or even maybe if both countries used to be united (Kepaptsoglou et al. 2010).

This model, however, is usually used to analyze trade between countries who are involved in one multilateral agreement that makes it not very suitable to be used in examining bilateral agreement. Therefore, this research uses modified gravity model that combined several variables from formulas in previous studies. The first formula is a model in research by Yang and Martinez-Zarzoso (2014) that used augmented gravity model to analyze the effect of ACFTA toward member countries' trade flow in four different sectors --- agricultural goods, manufactured goods, chemical products and machinery & transport equipment (Yang and Martinez-Zarzoso 2014: 143). Aside from using independent variables that are commonly found in gravity model, this research also puts three additional binary variables related to FTA that uses measure-specific trade effects in ACFTA. Positive and statistically significant results of these FTA variables represent trade creation effects between member countries (FTA1), export activities to non-member countries (FTA2) and import activities expansion from non-member to member countries (FTA3). The result of this study shows that ACFTA yields positive and statistically significant result on trade creation, with manufactured goods and chemical products having relatively bigger coefficients than other sectors. However, this result only appears after the elimination of all independent variables FTA1, FTA2 and FTA3. When the regression is done using all variables, the trade creation effects are statistically insignificant (Yang and Martinez-Zarzoso 2014).

The next formula used is from a study by Kahouli and Maktouf (2015) that examined through gravity model the trade creation and diversion effect from free trade agreement in Mediterranean area and how financial crisis impacting export flows between member countries. Compared to study by Yang and Martinez-Zarzoso, this study has several different variables: absolute values of GDP differences between countries (DIFGDP), similarity of the size of GDP (SIML), nominal exchange rate for each country (RER), dummy variables of countries with colonial past (COL) and global crisis (CRISIS). The result shows that almost all independent variables have significant effect, with all of the dummy variables related to trade creation give positive sign, even if the number is lower than prediction (Kahouli and Maktouf 2015).

Chapter 3: Data and Methodology

This chapter first explains the variables used in the research together with its sources as well as how data of these variables are gathered and adjusted in the first section. Secondly, it explains the methodology that applied including development and final form of the gravity model used to answer the main research question. Lastly, it also explains how this gravity model is modified to answer sub research questions 1-3.

3.1 Data

This section describes all secondary data used in this research alongside its respective sources, the gathering process and the descriptive statistics deemed important in determining how varied the data are. Furthermore, there will be an explanation about several tests conducted such as correlation test to see correlation rate between variables and Hausman test to determine whether to use Fixed Effect or Random Effect Model on the regression analysis.

3.1.1 Data Description and Sources

This is a quantitative research using regression analysis with secondary data related to trade between Indonesia and Japan. All of the data used are secondary data gathered from various public sources including IJEPA agreement and official sites such as United Nation, government's websites, World Bank, and the International Monetary Fund (IMF) websites. The regression uses panel data with time dimension limited from 1997 to 2017, which marks 10 years before and after the signing of IJEPA agreement in 2007, and 96 sectors (Appendix I) of Harmonized System Codes (HS Codes) as space dimension, which makes 2,016 observations for each variable. The analysis has export values and import values as dependent variables, and five independent variables, namely GDP, exchange rate, tariffs, quota limitation and specific IJEPA effects. The last two variables are binary where value of 1 in export or import quota represents the existence of quota limitation meanwhile FTA1 takes value of 1 from 2008 onwards when both countries implemented the agreement, the opposite conditions represented by zero. To cope with zero trade in export and import values, this research adds value of 1 to those samples as it is immaterial compared to other samples that have values of thousands or millions of dollars. After that, export, import and GDP variables are transformed into natural logarithm.

A more detailed description and source of the data used is as follows:

Table 2: **Data Descriptions and Sources**

Data	Description	Source
Export Value	Export values of 96 sectors of products from Indonesia to Japan (1997-2017)	United Nations Trade Statistics (2018)
Import Value	Import values of 96 sectors of products from Japan to Indonesia (1997-2017)	United Nations Trade Statistics (2018)
GDPIJ	Combination of Indonesian and Japanese GDP from 1997 to 2017	World Bank (2018[a])
Exchange Rate	Exchange rate of Indonesian Rupiah in comparison to 1 Japanese Yen	IMF 2018; World Bank (2018[b])

Indonesian Tariff	Tariff applied by Indonesia towards import from Japan. Tariff before the agreement (1997-2007) are found in Indonesian Customs Tariff Book while tariff after the agreement (2008-2017) taken from IJEPA agreement.	Government of Indonesia and Government of Japan (2007); Kementerian Keuangan (2017)
Japanese Tariff	Tariff applied by Japan towards Indonesia's export. Tariff before the agreement (1997-2007) are taken from Japanese customs website while tariff after the agreement (2008-2017) taken from IJEPA agreement	Government of Indonesia and Government of Japan (2007); Japan Customs (2018)
Quota (dummy variable)	All limitations on export and import made by Indonesian government including maximum quota, prohibition and restriction.	Pengelola Portal Indonesia National Single Window (2017)
FTA1 (dummy variable)	Specific trade effect of IJEPA that takes value of 1 after the agreement implementation in 2008	N/A

Source: Author's Elaboration

In gathering the data needed as listed on Table 2, there are several adjustments made to arrange a suitable data set for regression analysis, which are:

1. The implementation of IJEPA started from July 2008. However, since time dimension in this research is pegged per year, the whole 2008 is counted as the beginning of agreement implementation.
2. Export and import values are gathered from single sources, comtrade.un.org, United Nations' official international trade statistics that has a very comprehensive set of data for both countries' trade values up until subsectors (6 digits HS code) format, a highly specific classification of goods. Although, note that the trade used as dependent variable for this research are in sectors format (2 digits HS code). Using an international single source is simpler and more reliable than using two different government's websites since all of the data are in US$, making it insensitive to exchange rate fluctuation.
3. GDP for Indonesia and Japan are combined for the regression, since there are only two countries in the analysis and the purpose of this variable is to visualize the economy size of both countries. Therefore, combining both countries' GDP into one variable makes the regression analysis more compact.
4. In contrast to trade values and GDP, exchange rate data were gathered from two different resources: the IMF and World Bank. To begin with, the main resource of this data is IMF. However, the website does not possess Indonesia's exchange rate data from 1999 to 2001, making it necessary to be combined with data from World Bank. Originally, exchange rate data are a comparison of the countries' respective currencies (Indonesian Rupiah and Japanese Yen) with 1 US Dollar. Then again, the writer divided Rupiah's with Yen's exchange rate to get a value of Rupiah in comparison to 1 Japanese Yen (Appendix II).
5. For variable tariff, the data can be divided into Indonesian and Japanese tariffs. Indonesian tariffs are those applied to imported goods from Japan, while Japanese tariffs are applied to goods that are exported by Indonesia. Before the agreement took place, the tariffs scheme was mostly fixed throughout the year, which can be found from each country's tariffs book and/or website. IJEPA agreement, however, has several different tariff reduction schemes to be applied since its implementation. The reduction schemes differ from instant elimination (A) which means the tariffs are free from the first day of implementation, B3/5/7/10/15 where the tariffs will be decreased evenly for 4/6/8/11/16 years including the implementation year, and X where the tariffs are not deducted at all even after the implementation.
6. Data for quota variable are gathered from a single source, the Indonesian government website, since Japanese quota database is inaccessible due to language barriers and permission requirement.

In the website, there are several kinds of goods' limitations applied by Indonesia toward both export and import including goods that have quota limitations, require government permit, need surveyor report, restricted and even prohibited. With so many types of limitations, the writer decided to make this variable into a dummy variable where it takes the value of 1 if particular sector has any of the limitations mentioned before and 0 if it does not.

7. For both tariffs and quota, the original data are in subsectors format while the dependant variable is in sectors format. Therefore, an adjustment is made by picking several subsectors trade values from random year (the writer chooses 2003) that represents 50 percent of the respective sector's trade value and weighted the tariffs and quota based on their shares. For example, subsector 1604.19 represents 68 percent of sector 16 trade value and the tariff for that subsector is 15 percent, hence, the tariff for sector 16 is (100%/99%)x15%. Similar calculation applied for quota that if majority of subsectors have limitation, the respective sector has the value of 1. The complete outcome of this weighting process is provided in Appendix III.
8. For variable FTA1, there is no specific data gathering process since this dummy variable has a fixed pattern that takes value of 0 from 1997 to 2007 and 1 from 2008 to 2017.

While working with numerical data, descriptive statistics is needed to visualize the range and variation of the data. From Table 2 above, all of the variables' statistics report except quota and FTA1 which are dummy variables, are calculated with result as follows, with export values, import values, and GDPIJ amounts in natural logarithm form:

Table 3: Descriptive Statistics

Variables	MEAN	STD.DEV	MIN	MAX
EXPORT VALUES	15.6002	3.6324	0	23.6753
IMPORT VALUES	14.1913	4.5759	0	22.6482
GDPIJ	29.3002	0.1487	29.0482	29.5936
EXCHANGE RATE	91.5505	22.8811	22.01	122.69
JP TARIFFS	0.0405	0.0707	0	0.3171
ID TARIFFS	0.0527	0.0845	0	0.7175

Data source: STATA output

On Table 3, it can be seen that export values have slightly higher mean and smaller standard deviation compared to import values. The standard deviation indicates that import values have bigger spread and more numbers scored far away from the mean compared to export values. Furthermore, GDPIJ and both tariffs have very small standard deviation, which means the values are spread really close to their means. Meanwhile exchange rate has exceptionally high standard deviation, which is justified by a big difference in its minimum and maximum value. This is due to the Asian financial crisis in 1997 that hit Indonesia really hard and resulted in weakening of Indonesian rupiah from 22.01 in 1997 to 86.42 in 1998, in comparison to 1 Japanese yen (Appendix 2).

3.1.2 Correlation Table

Regression analysis is applied to see the effect of changes in one independent variable toward the dependent variable isolated, with other independent variables remain constant. A high correlation between two or more independent variables indicates that changes in one will be followed by changes in the other, making it harder for the model to estimate the relationship of each independent variable with dependent one *independently*. Using correlation test, it can be seen that if two variables have correlation score of more than 0.8, it means they are highly correlated and have almost exact linear relationship between them (Gujarati and Porter 2009).

The result of correlation test of the data used in this research is as follows:

Table 4: Export Correlation Test

Variables	Export Values	GDPIJ	Exchange Rate	JP Tariffs	Export Quota	FTA1
EXPORT VALUES	1					
GDPIJ	0.0752	1				
EXCHANGE RATE	0.0696	0.7068	1			
JP TARIFFS	-0.0955	-0.1923	-0.1873	1		
EXPORT QUOTA	0.1174	0.1136	0.1461	-0.1341	1	
FTA1	0.0541	0.8407	0.8016	-0.2302	0.1189	1

Data source: STATA output

Table 5: Import Correlation Test

Variables	Export Values	GDPIJ	Exchange Rate	JP Tariffs	Export Quota	FTA1
IMPORT VALUES	1					
GDPIJ	0.1622	1				
EXCHANGE RATE	0.1695	0.7068	1			
ID TARIFFS	-0.1254	-0.2412	-0.2502	1		
IMPORT QUOTA	-0.1971	0.1562	0.1870	-0.1050	1	
FTA1	0.2189	0.8407	0.8016	-0.2869	0.1636	1

Data source: STATA output

Based on Tables 3 and 4, there are high correlation values between GDPIJ and FTA1, and exchange rate and FTA1. The explanation regarding this result is that the amount of GDPIJ and exchange rate have tendencies to increase over time alongside the growth of countries' economy, while FTA1 is a binary variable that takes the value of 1 since the implementation of IJEPA in 2008. That is why both GDPIJ and exchange rate have bigger values when FTA1 is 1 than when it is at 0.

3.1.3 Hausman Test

There are three techniques that can be used for panel data regression model, namely± Pooled OLS model, Fixed Effect Model (FEM), and Random Effect Model (REM). However, pooled OLS model is the least suitable model for panel data since it does not distinguish space and time dimensions (Gujarati and Porter 2009: 594). Then, to choose between FEM and REM techniques, one can use a tool called Hausman test. Null hypothesis in Hausman test is that FEM and REM estimators do not have significant differences, while rejecting null hypothesis means REM is not appropriate to be used in the analysis. If the probability (Prob>chi2) is less than five percent, null hypothesis will be rejected.

The result of Hausman test for export in this research produces a **Prob>chi2 of 0.6568**, which means null hypothesis is failed to be rejected and both FEM and REM will give similar estimators.

Meanwhile, the result of Hausman test for import is **Prob>chi2 of 0.077,** which also failed to reject null hypothesis. However, since the latter number is closer to five percent, there might be a slight difference between the result of FEM and REM models on import. Based on this conclusion, this research employs both FEM and REM for the regression analysis.

3.2 Methodology

This section explains the methodology used in this research in order to answer main and sub research questions. As mentioned earlier, this research uses a panel data regression analysis as is part of linear regression that analyses relation between dependent and independent variables in a straight line. This section describes the development of linear equation used, which is an augmented gravity model that adopted several variables from various prior studies. Each subsection explains the equation used in answering each research question and hypothesis for main research question and sub research question number 1.

3.2.1 Calculating IJEPA Effect on Indonesia's Export and Import Flow

As explained before in literature review, the regression analysis in this study uses a modified gravity model by combining variables from study by Yang and Martinez-Zarzoso (2014) and by Kahouli and Maktouf (2015). The model used to answer main research question of this research can be seen as follows:

$$\mathrm{Y_{it}} = \alpha_{it} + \beta_1 GDPIJ_{it} + \beta_2 XR + \beta_3 TR_{it} + \beta_4 Q + \beta_5 FTA1_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Where

Y	:	Export or Import value for specific product in certain time
GDPIJ	:	Combination of Indonesian and Japan GDP
XR	:	Exchange rate of Indonesian Rupiah in comparison of 1 Japanese Yen
TR	:	Tariffs before and after IJEPA implementation. Divided into tariffs applied by Japanese government for Indonesia's exported goods (Jp Tariffs) and imported goods tariffs which is tariffs applied by Indonesian government for imported goods from Japan (Id Tariffs)
Q	:	Quota limitation for exports (Export Quota) and imports (Import Quota) issued by Indonesian government
FTA1	:	Specific trade effect of IJEPA

Each independent variable mentioned above has its own significance in explaining the effect it brings on export/import values as dependent variables. The first variable, GDP, is an explanatory variable that always appears in gravity model because it visualizes the economy size of a country and its ability to do international trade (Kepapstoglou et al. 2010: 3). Then, Kahouli and Maktouf (2015) employed exchange rate as the independent variable used to explain whether changes in currency power of one country affect its trade flow. While this research focuses on trade between two countries only, there are several other independent variables found in classic gravity model such as distance, language, and border that are not compatible with this research as they do not differentiate space and/or time dimensions. Therefore, the writer chooses tariffs and quota as independent variables as they address exported/imported goods sectors as space dimension specifically (Wincoop 2003). The last variable, FTA1, used by Yang and Martinez-Zarzoso (2014) to codify whether the agreement has

been implemented or not in the observed year and see the agreement's impact on promoting trade between country i and j (Yang and Martinez-Zarzoso 2014: 143).

However, correlation test on subsection 3.1.3 shows that GDPIJ and FTA1, and exchange rate and FTA1 are highly correlated with each other. This means that if one of the variables increases, the other that is highly correlated to it have big tendencies to rise as well. This is not an ideal condition in regression analysis since it affects the validity of the individual coefficient prediction. One of the simplest way to deal with high correlation is by dropping one or more collinear variables from the equation. However, it will create a specification bias where coefficient estimation of the remaining variables might be biased due to incorrect specification of the model (Gujarati and Porter 2009). Therefore, the author decides to do two regression that separate FTA1 from GDPIJ and exchange rate, changing the equation to as follows:

$$Y_{it} = \alpha_0 + \beta_1 GDPIJ_{it} + \beta_2 XR + \beta_3 TR_{it} + \beta_4 Q_{it} + \varepsilon_{it} \quad (3)$$

$$Y_{it} = \alpha_0 + \beta_1 TR_{it} + \beta_2 FTA1_{it} + \varepsilon_{it} \quad (4)$$

The hypothesis for the regression results are:

H_0: Independent variable does not have any effect on Indonesia's export or import values

H_1: Independent variable has effect on Indonesia's export or import values

3.2.2 Calculating IJEPA Effect on Indonesia's Trade Balance

While the main research question examined IJEPA effect on export and import values separately, the first sub research question tries to see the agreement effect on overall trade balance to have an idea whether it creates positive or relatively negative trade balance. The formula used is as follows:

$$TB_{it} = \alpha_0 + \beta_1 GDPIJ_{it} + \beta_2 XR + \beta_3 TRI_{it} + \beta_4 TRJ_{it} + \beta_5 QE_{it} + \beta_6 QI_{it} + \beta_7 FTA1_{it} + \varepsilon_{it} \quad (5)$$

The hypotheses for the regression results are:

H_0: Independent variable does not have any effect on Indonesia's trade balance

H_1: Independent variable has effect on Indonesia's trade balance

The analysis uses similar model as equation (2) with Trade Balance (TB) being the dependent variable instead of export/import values. The value of trade balance is calculated as differences between exports and import values in particular sector and time. Since several sectors have bigger import than export values, there are trade balances with negative values so the regression analysis does not translate this variable into natural logarithm format. Also, as the calculation includes both export and import, both Indonesian and Japanese tariffs as well as export and import quotas are included in the calculation.

3.2.3 Finding Most Affected Sectors

The next two sub research questions try to figure out which sectors are affected the most by the implementation of IJEPA. Sub question number 2 aims to find out which sector experiences the most dramatic increase, while sub question 3 looks for sector with biggest drop as the tariffs change. This research still uses panel data regression analysis, similar with equation (2), to answer the questions but only with tariffs and FTA1 as independent variables since it only wants to see how the changes in tariffs affect export and import values. The formula is as follows:

$$Y_{it} = \alpha_0 + \beta_1 TR_{it} + \beta_2 FTA1_{it} + \varepsilon_{it} \quad (6)$$

Y denotes export or import value, TR represents Indonesian or Japanese tariffs, and FTA1 as dummy variable of specific agreement effect. The calculation used formula 6 and regressed it by sectors to see the overall coefficient for tariff as well as coefficient for each of 96 sectors. Then, to calculate the exact effect on each sample products, this research uses the formula as follows:

$$EFFECT = \{(TRMax - TRMin) * Coeff\} + CHAPTERCoeff \text{.....(7)}$$

Where:

EFFECT	:	Effect on trade values when tariffs increase from the lowest to the highest
TRMax	:	The highest export or import tariffs in the population
TRMin	:	The lowest export or import tariffs in the population
Coeff	:	Tariff coefficient for overall population
CHAPTERCoeff	:	Tariff coefficient for particular sector

While both tariff coefficient for whole population and for each sector are obtained from regression of equation 6, the maximum and minimum values can be seen in descriptive statistics data in subsection 3.1.1. The result of this calculation visualizes how much export or import values change when tariff for that sector increases from the lowest to the highest tariff.

Chapter 4: Findings and Analysis

This chapter provides the regression result of equations explained in Chapter 3 using data that have been gathered. First, it answers the main research question on the impact of IJEPA on Indonesia's export and import flow alongside analysis captured from the result. Secondly, it answers the first sub research question of IJEPA impact on Indonesia's trade balance to get an illustration on whether IJEPA increases exports more than imports (positive trade balance), or the other way around. Lastly, this chapter answers sub research questions 2 and 3 by addressing which exported and imported products experience biggest leap and drop whenever tariffs change.

4.1 Effect of IJEPA on Indonesia's Export and Import Flow

This section focuses on answering the main research question using the augmented gravity model explained at subsection 3.2.1. It starts by looking at regression result on export values using both fixed effect and random effect method as well as result on export values growth in subsection 4.1.1. Then subsection 4.1.2 provides result for import values and import values growth alongside analysis and comparison to result from subsection 4.1.1.

4.1.1 Exports Empirical Result

This subsection presents the multiple regression result with export values as dependent variable using equation in subsection 3.2.1. For both FEM and REM techniques, this study uses GDPIJ as first regressor and gradually adds exchange rate, Japanese tariffs and export quotas one by one. Also as mentioned above, variable FTA1 is regressed separately from GDPIJ and exchange rate due to high correlation. The fixed effects regression result is as follows:

Table 6: Export Levels (Fixed Effects Regressions)

Variables	(1) EXPORT VALUES	(2) EXPORT VALUES	(3) EXPORT VALUES	(4) EXPORT VALUES	(5) EXPORT VALUES
GDPIJ	1.838***	1.270***	1.505***	1.464***	
	(0.526)	(0.426)	(0.485)	(0.481)	
EXCHANGE RATE		0.005	0.007*	0.005	
		(0.004)	(0.004)	(0.004)	
JP TARIFFS			4.133	3.944	2.909
			(3.151)	(3.057)	(3.183)
EXPORT QUOTA				0.573*	
				(0.327)	
FTA1					0.488**
					(0.189)
Constant	-38.256**	-22.090*	-29.268**	-28.027*	15.250***
	(15.427)	(12.421)	(14.263)	(14.137)	(0.188)
Observations	2,016	2,016	2,016	2,016	2,016
R-squared	0.023	0.025	0.028	0.032	0.013
Number of id	96	96	96	96	96

Robust standard errors in parentheses

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

Data source: STATA output

From table 6, it can be seen that combination of Indonesian and Japanese GDP (GDPIJ) give positive effect on values of goods exported from Indonesia to Japan. For example, result in column (4) said that with every 1 unit increase of GDPIJ, export values will increase by 1.464 unit on average, holding all other variables constant. Throughout the regression, even though more variables are added to the model (column 1-4), the result shows that GDPIJ has significant effect on export values, thus, we reject the null hypothesis with extremely high level of confidence (more than 99%). It can be interpreted that export values increases alongside the expansion of countries' economy (represented by GDP). The other variable that has significant effect on export values with high level of confidence (more than 95%) is FTA1, where for every 1 unit increase on this variable, export values increase by 0.488 unit. Since FTA1 is a binary variable and value of 1 represents the existence of agreement, it can be concluded that export values increased by 0.488 unit with the implementation of IJEPA.

On the other hand, the rest of the independent variables (exchange rate, Japanese tariffs and export quotas) have high P values with most of them scored more than 10 percent. This means that there are very weak to not enough evidence to reject the null hypothesis. The result shows that quota has small significant effect, while exchange rate and Japanese tariffs are not statistically significant toward export values. By crosschecking it with data from Appendix IV, an analysis that can be used to explain tariffs result is that the sectors with big export values, such as sector 27 (mineral fuels, oils, distillation products, etc) and sector 26 (ores, slag and ash), already has 0 percent tariff from 1997, which means there are no change in tariff for these sectors after IJEPA implementation while their export values tend to increase overtime. Since the total of these sectors represents more than 60 percent of total export values, the tariff reduction impact on other sectors' trade fluctuation is overshadowed by them. Therefore, the sign in front of tariff coefficient is not negative as how it should be. Another possibility to explain this counterintuitive sign is that majority of exported goods have inelastic demand that no matter how big the tariffs are, it will not affect amount of demand for the goods. Meanwhile for quota, export values of sectors with limitation is less than seven percent of overall export values. This only means that most of exported goods has no limitation, therefore the sign in front of the coefficient is positive.

Table 7: Export Levels (Random Effects Regressions)

Variables	(1) EXPORT VALUES	(2) EXPORT VALUES	(3) EXPORT VALUES	(4) EXPORT VALUES	(5) EXPORT VALUES
GDPIJ	1.838***	1.270***	1.454***	1.414***	
	(0.526)	(0.426)	(0.472)	(0.467)	
EXCHANGE RATE		0.005	0.006*	0.005	
		(0.004)	(0.003)	(0.004)	
JP TARIFFS			3.236	3.098	2.051
			(2.774)	(2.692)	(2.780)
EXPORT QUOTA				0.611*	
				(0.314)	
FTA1					0.460**
					(0.182)
Constant	-38.256**	-22.090*	-27.712**	-26.497*	15.298***
	(15.354)	(12.375)	(13.841)	(13.699)	(0.374)
Observations	2,016	2,016	2,016	2,016	2,016
Number of id	96	96	96	96	96

Robust standard errors in parentheses

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

Data source: STATA output

While Table 6 shows regression result using fixed effect model, Table 7 provides the result of random effect model. Verifying Hausman test result previously, it can be seen that both models have almost identical results in coefficients, standard errors and p values. It brings the same conclusion that the result shows positive and significant effect from GDP and FTA (reject null hypothesis), while other variables do not have enough evidence to reject the null hypothesis. As mentioned in Chapter 3, Hausman test result shows that there will be no recognizable differences between FEM and REM results.

As mentioned earlier, out of 96 sectors, there are sectors that have way bigger or smaller trade values compared to the others. This means that using the original trade values can be inaccurate in portraying the effect on each sector. Therefore, this research also examined the impact of IJEPA using growth values. The idea is to see how the growth in independent variables affects the growth of export/import values. All of the variables, both dependent and independent, are replaced by its growth rate except for binary variables which are left as it is. Variables export growth and GDPIJ growth replaced export values and GDPIJ, consecutively, with understanding that changes in natural logarithm equal to growth of actual values. Table 8 shows the result of this regression.

Table 8: Export Growth (Fixed Effects Regressions)

Variables	(1) EXPORT GROWTH	(2) EXPORT GROWTH	(3) EXPORT GROWTH	(4) EXPORT GROWTH	(5) EXPORT GROWTH
GDPIJ GROWTH	2.327***	2.123***	2.269***	2.221***	
	(0.501)	(0.411)	(0.445)	(0.434)	
EXCHANGE RATE GROWTH		-0.091	-0.086	-0.098	
		(0.092)	(0.091)	(0.098)	
JP TARIFFS GROWTH			0.491*	0.482*	0.216
			(0.281)	(0.281)	(0.266)
EXPORT QUOTA				-0.158	
				(0.227)	
FTA1					-0.121**
					(0.048)
Constant	0.042***	0.059***	0.073***	0.106*	0.138***
	(0.006)	(0.015)	(0.018)	(0.053)	(0.024)
Observations	1,920	1,920	1,920	1,920	1,920
R-squared	0.010	0.011	0.012	0.013	0.001
Number of id	96	96	96	96	96

Robust standard errors in parentheses

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

Data source: STATA output

It can be seen that regression result for GDPIJ has similar confidence level with the results from Table 6, with slightly higher coefficients. Taking example from column 4, it can be interpreted that when GDPIJ grows for one percent from previous year, growth of export values increases by 2.22 percent, while the other variables remain constant. Thus, this research rejects null hypothesis on growth in GDP with extremely high level of confidence. Meanwhile, the confidence level for exchange rate and FTA1 is also similar with Table 6 but with different coefficient sign, where FTA1 in this result has negative coefficient sign. The fact that the growth of export values decreased up to 0.121 point with the changes of FTA1 from 0 to 1 might be caused by various external factors. While there is a

need for further research, one thing that might be captured by this number is the effect of global financial crisis in 2008-2009 which overlapped with IJEPA implementation in 2008.

Then, a noticeable difference happened with tariffs' significance level where in Table 7, tariffs growth have more significant effect with p value less than 10 percent; although the sign still says that growth in tariffs gives positive effect for export values growth with pretty high coefficient, where 1 percentage increase of tariff growth increases export growth values up to 0.5 percentage. Similar to explanation for Table 6, this result too can be affected by how export sectors with biggest values did not experience changes in tariffs and possibility of inelastic demand as noted before. The last independent variable, quota, has an expected negative coefficient, which means that if there is quota applied, related export values will have negative growth. However, the p value of this variable showed a statistical insignificant effect, which means there is not enough evidence to reject the null hypothesis.

Key Result

From Table 6 and 8 it can be seen that GDP and FTA have significant effect on export values and export values growth with confidence level of 99 percent and 95 percent, consecutively. Then, changes in tariffs have lower significance effect on export values and no significance effect on export values growth, while quota has no significance on export values and low significance effect on export values growth. Lastly, exchange rate does not have any significant effect to both export values and growth.

In conclusion, the regression result reject the null hypothesis for GDP and FTA with high confidence level, reject null hypothesis for tariffs and quota with low confidence level, and failed to reject null hypothesis for exchange rate.

4.1.2 Import Empirical Result

Still using the same regression model, this subsection examines the impact of independent variables GDPIJ, exchange rate, Indonesian tariffs, import quota and IJEPA specific effect (FTA1) on values of imported goods from Japan to Indonesia. The result of fixed effects model is as can be seen in table 9:

Table 9: Import Levels (Fixed Effects Regressions)

Variables	(1) IMPORT VALUES	(2) IMPORT VALUES	(3) IMPORT VALUES	(4) IMPORT VALUES	(5) IMPORT VALUES
GDPIJ	4.990***	2.603***	1.958***	2.055***	
	(0.607)	(0.447)	(0.487)	(0.488)	
EXCHANGE RATE		0.022***	0.017***	0.019***	
		(0.004)	(0.004)	(0.004)	
ID TARIFFS			-8.832***	-8.824***	-3.633
			(3.228)	(3.135)	(3.298)
IMPORT QUOTA				-0.717*	
				(0.391)	
FTA1					1.829***
					(0.268)
Constant	-132.014***	-64.094***	-44.234***	-47.107***	13.512***
	(17.789)	(13.123)	(14.398)	(14.398)	(0.263)
Observations	2,016	2,016	2,016	2,016	2,016

R-squared	0.046	0.057	0.063	0.066	0.085
Number of id	96	96	96	96	96

Robust standard errors in parentheses

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

Data source: STATA output

On Table 9, it can be seen that similar to export results, countries' economy size have significant positive impact on import values with level of confidence more than 99 percent, although there are noticeable decrease in the coefficients when other variables are added gradually. Take example in column 1, one percent increase in GDPIJ boosts import values by as much as 4.99 percent with no other variables in the equation. Meanwhile, it only increases import values by 2.0 percent while other variables remain constant (column 4). Far from export result, Table 9 shows that exchange rate, Indonesian tariffs and dummy variable FTA1 give significant effect with extremely high level of confidence (p values < 1%). Both exchange rate and FTA1 have positive sign, which means increase in these variables results in increase on import values as well.

On the contrary, Indonesian tariffs have significant negative impact with rather big coefficient on import values. In column 4, one percent increase of tariff makes import values decrease by 8.82 percent. This result makes sense since the greater the tariff, the more expensive import prices will be and it will eventually decrease the number of imported goods. In line with this logic and result, the implementation of IJEPA that reduced and/or eliminated import tariff will increase import values. In the end, it can be concluded that the regression result rejects null hypothesis for GDPIJ, exchange rate, Indonesian tariffs and FTA1 with high confidence level, while null hypothesis for import quota is rejected with lower level of confidence.

Table 10: Import Levels (Random Effects Regressions)

Variables	(1) IMPORT VALUES	(2) IMPORT VALUES	(3) IMPORT VALUES	(4) IMPORT VALUES	(5) IMPORT VALUES
GDPIJ	4.990***	2.603***	2.050***	2.208***	
	(0.607)	(0.447)	(0.481)	(0.480)	
EXCHANGE RATE		0.022***	0.017***	0.021***	
		(0.004)	(0.004)	(0.004)	
ID TARIFFS			-7.569**	-7.508**	-3.652
			(3.223)	(3.206)	(2.866)
IMPORT QUOTA				-1.139***	
				(0.385)	
FTA1					1.828***
					(0.256)
Constant	-132.014***	-64.094***	-47.074***	-51.748***	13.513***
	(17.703)	(13.086)	(14.141)	(14.129)	(0.336)
Observations	2,016	2,016	2,016	2,016	2,016
Number of id	96	96	96	96	96

Robust standard errors in parentheses

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

Data source: STATA output

As mentioned in Hausman test in Chapter 3, the result from fixed effect and random effect models will give similar result on coefficients and significance level, and it can be seen on Table 10 that the coefficients, standard errors, and p values of GDPIJ, exchange rate, Indonesian tariffs and FTA1 are similar to fixed effect result in Table 9. However, there is a notable difference in import

quota where p values for the variables is less than 1 percent, which means that import quota has negative significant effect towards import values. It justifies the Hausman test result in Chapter 3 where the probability for import values is close to five percent, thus, there is a probability that FEM and REM results will show several recognizable differences, although both are still appropriate for the analysis. In conclusion, using REM techniques, there are strong evidences to reject null hypothesis on every independent variable.

Similar to regression analysis on export values, this paper does regression analysis using import-related variables' growth rates with result as follows:

Table 11: Import Growth (Fixed Effects Regressions)

Variables	(1) IMPORT GROWTH	(2) IMPORT GROWTH	(3) IMPORT GROWTH	(4) IMPORT GROWTH	(5) IMPORT GROWTH
GDPIJ GROWTH	-7.765***	-8.718***	-8.727***	-8.699***	
	(1.523)	(1.566)	(1.566)	(1.561)	
EXCHANGE RATE GROWTH		-0.426***	-0.426***	-0.406***	
		(0.092)	(0.092)	(0.093)	
ID TARIFFS GROWTH			0.000***	0.000***	0.000***
			(0.000)	(0.000)	(0.000)
IMPORT QUOTA				0.232	
				(0.269)	
FTA1					0.164***
					(0.042)
Constant	0.135***	0.218***	0.218***	0.159**	-0.041*
	(0.018)	(0.027)	(0.027)	(0.067)	(0.021)
Observations	1,920	1,920	1,920	1,920	1,920
R-squared	0.035	0.040	0.040	0.041	0.001
Number of id	96	96	96	96	96

Robust standard errors in parentheses

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

Data source: STATA output

The result on Table 11 has several different points compared to Table 9. To begin with, almost all independent variables have extremely high confidence level with p value of less than one percent except import quota, thus, null hypothesis for GDP growth, exchange rate growth, import tariffs growth and FTA1 are rejected while null hypothesis for import quota failed to be rejected. However, a negative sign is found in GDP growth coefficient where the result says that when Indonesian and Japanese economy grow by one percentage growth in imported goods from Japan to Indonesia will rather decrease by 8.69 percentage with other variables stay constant (column 4). What might be captured by this number is that when economy grows, Indonesia's industrialization also grows, which makes the need to import manufactured goods from Japan decreases. Then, coefficients for exchange rate have expected sign where a positive growth in exchange rate gives negative significant effect on import values growth. This is because when exchange rate has positive growth, imported goods will

be more expensive, thus decreasing number of imports. Lastly for FTA, similar with result on Table 8, it gives positive significant effect as expected.

Key Result

On Tables 9 and 11, it can be seen that all of independent variables except quota have significant effect on import values and import values growth with high confidence level of 99 percent. Meanwhile, quota has lower significant effect with confidence level of 90 percent on import values and insignificant effect on import values growth.

In conclusion, the regression result rejects the null hypothesis for GDP, exchange rate, tariffs, and FTA with high confidence level, rejects null hypothesis quota towards import values with low confidence level, and fails to reject null hypothesis for quota towards import values growth.

4.2 Impact of IJEPA towards Indonesia's Trade Balance

After examining how the agreement affects export values and import values separately, this subsection answers sub research question 1 about how IJEPA affects Indonesia's trade balance. From subsections 4.1.1 and 4.1.2, it can be seen that the implementation of IJEPA brings positive impact on export and import values as both variables increase when FTA1 increases. However, to look closer on whether this agreement gives more benefits to Indonesia or not, there is a need to examine how IJEPA affects trade balance as one variable because there is a possibility that import values have bigger increase than export values, which means the agreement has a negative effect on Indonesia's trade balance. In doing so, the analysis uses equation 5 from subsection 3.2.2 with variable Trade Balance calculated from Export Values – Import Values. Similar to how main research question is answered, regression process in this subsection is done by adding the independent variable one by one and making a separate regression for FTA1, separated from GDPIJ and exchange rate. The result as shown below:

Table 12: Trade Balance Fixed Effect Regression Result

Variables	(1) TRADE BALANCE	(2) TRADE BALANCE	(3) TRADE BALANCE	(4) TRADE BALANCE	(5) TRADE BALANCE
GDPIJ	54.429	120.5	121.8	100.5	
	(240.6)	(299.7)	(345.4)	(334.9)	
EXCHANGE RATE		-0.607	-0.595	0.725*	
		(0.638)	(0.396)	(0.725)	
JP TARIFFS			-10.12	-61.42	-193
			(517.3)	(485.3)	(566)
ID TARIFFS			25.97	-102.3	-137
			(374.2)	(296.2)	(385)
EXPORT QUOTA				290.7	
				(209.8)	
IMPORT QUOTA				-48.58	
				(68.11)	
FTA1					-23.7
					(866)
Constant	-1500	-3380	-3421	-2773	121***
	(6949)	(8628)	(10030)	(9706)	(42.6)

Observations	2,016	2,016	2,016	2,016
R-squared	0.000	0.001	0.001	0.000
Number of id	96	96	96	96

Note: All coefficients are in millions

Robust standard errors in parentheses

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

Data source: STATA output

As can be seen above, none of the independent variables give significant effect on trade balance as dependent variables. However, putting aside the significance level, there are a lot of different effects that can be summarized from variables' coefficients. To begin with, GDPIJ has positive coefficients, which means that when economy size of Indonesia and Japan get bigger, Indonesia's export tends to increase and results in positive trade balance. For example, in column 4, when GDPIJ increase by 1 unit, Indonesia's trade balance increases by more than 100 units with other variables remain constant.

Then, for Japanese tariffs, the result shows that it has negative effect on trade balance as predicted, because if Japan increases their tariffs for exports, Indonesia's exported goods becomes more expensive, thus decreasing in quantity. Meanwhile for Indonesian tariffs, the coefficient in column 4 says that when Indonesia increases tariffs for imported goods, the trade balance decreases. This is rather counterintuitive considering that increase in tariffs should make imported goods more expensive, hence decreasing the amount of import and increasing trade balance. Furthermore, for quota variables, both of them contradict writer's thought since export quotas should decrease export amount and give negative effect for trade balance while import quotas should do the opposite. Lastly, for FTA1, result shows that it gives negative effect on trade balance, which means that the rise of import values after IJEPA implementation outweighed the increase of export values.

Key Result

On Table 12, it can be seen that while there are no independent variables that have significant effect on trade balance, GDPIJ, exchange rate, and export quota have positive relationship, while both tariffs, import quota, and FTA1 give negative impact.

In conclusion, the implementation of IJEPA boosts import values more than export values, thus giving negative effect on Indonesia's trade balance.

4.3 Most Affected Sectors

While sections 4.1 and 4.2 examine IJEPA effect on a bigger picture of export, import and trade balance, this subsection aims to answer sub research questions 2 and 3 by narrowing the analysis into which sectors were affected the most by IJEPA implementation. Using methodology explained in subsection 3.2.3, this subsection answers sub question 2 by analysing which sectors have the highest rise in both export and import values, while to answer sub question 3, this research needs to find the sector that suffers the deepest downfall after the implementation. The first step in the analysis is doing regression using equation 6 in subsection 3.2.3 that give result as can be seen in table 13:

Table 13: **Most Affected Export and Import Products**

Variables	(1) EXPORT VALUES	(2) IMPORT VALUES
TARIFFS	2.909	-3.633
	(3.261)	(3.379)
FTA1	0.488**	1.829***
	(0.194)	(0.274)
SECTOR 85 (ELECTRONICS)	8.002***	
	(0.000)	
SECTOR 93 (ARMS)	-7.041***	
	(0.201)	
SECTOR 84 (COSMETICS)		12.451***
		(0.003)
SECTOR 2 (MEATS)		-1.833***
		(0.064)
Constant	12.420***	6.503***
	(0.092)	(0.205)
Observations	2,016	2,016
Number of id	96	96

Robust standard errors in parentheses

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

Data source: STATA output

Table 13 shows exported (column 1) and imported (column 2) products that have the largest increase and the largest drop from IJEPA implementation. In doing the analysis, this section focuses on the effect of tariffs variable (TR) to trade values. Generally, as shown in both columns, export and import tariffs have no significant effect on the values with level of confidence less than 90 percent, while FTA1 variables have high significant effect with more than 99 percent level of confidence. However, in deeper observation, it shows that the variables have significant effect on most of the products, especially those with largest increase and drop. For column 1, originally, sector with highest coefficient is sector 27 (Mineral fuels, oils, distillation products, etc) with coefficient 10.22 followed by sector 26 (Ores, slag and ash) with same coefficient as sector 85. However, these two sectors have never experienced changes in tariffs before or after the IJEPA implementation where it always has zero tariffs. Thus, it will be less reliable to do analysis using these two sectors.

Then, in order to calculate the exact effect on each sector, this research uses equation 7 in subsection 3.2.3 which produces results as shown in table 14:

Table 14: IJEPA's Largest Increase and Decrease

	EXPORT	IMPORT
Tariffs Max	0.317	0.717
Tariffs Min	0	0
SECTOR 85 (ELECTRONICS)	8.924	
SECTOR 93 (ARMS)	-6.118	
SECTOR 33 (COSMETICS)		9.846
SECTOR 2 (MEATS)		-4.437

Data source: STATA output

Table 14 shows that sector 85, which represents 'Electrical, electronic equipment', has the highest effect for export category. This means that when export tariffs increase from 0 to 0.317, export values of this sector increases almost nine-fold. This result makes sense since sector 85 has the third highest total export values from 1997 to 2007 (Appendix I), right behind sector 27 and 26. Thus, even though the export tariffs increase significantly, export values keep increasing. Meanwhile for sector 93, the 'Arms and ammunition, parts and accessories thereof', an increase in export tariffs from 0 to 0.317 decreases export values more than six-fold. An analysis for this number is that this sector barely has any export values except for one in year 2011, which makes sense if the export values plummet as export tariffs rise.

As for import category, sector 33 or the 'Essential oils, perfumes, cosmetics, toiletries' increases around nine-fold if import tariffs increase from 0 to 0.717. This is interesting since this sector is not even in 20 most imported products from 1997 to 2017 (Appendix I), although it has a significant trade values increase in the last 10 years. One thing that can explain this phenomenon is the condition in other foreign market. For example, if tariffs in other Japanese partner countries are still higher even though import tariffs in Indonesia rise into maximum, it does not give negative effects on import values. Another example is if even with pretty high import tariffs, imported products from Japan still have better quality and better price compared to product from other countries. Hence, Japanese imported products remain in demand. However, this is not something that can be concluded in this research as it needs further study to prove it.

Meanwhile for sector with highest drop, sector 2 that represents 'Meat and edible meat offal' has the largest decrease where it experience 400 percent fall in import values if import tariffs increase from 0 to 0.717. Similar to analysis for export highest drop, this sector has one of the smallest total import values from 1997 to 2017, thus an increase in import tariffs decreases the demand even more.

Key Result

Table 14 gives clear picture on which sectors have biggest increase and drop if there are changes in tariffs from minimum to maximum. For exported products, sector 85 (Electrical, electronic equipment) experiences the highest increase up to 8.9 fold when export tariffs increase from 0 percent to 31.7 percent, while sector 93 (Arms and ammunition, parts and accessories thereof) export values plummet for more than six-fold with the same increase in tariffs.

Meanwhile for imported goods, sector 33 (Essential oils, perfumes, cosmetics, toiletries) has the highest increase in import values up to 9.8 fold when tariffs increase from 0 percent to 71.7 percent, while import values of sector 2 (Meat and edible meat offal) experience 400 percent decrease in value.

Chapter 5: Conclusion and Recommendation

5.1 Conclusion

Trade liberalization and FTA have been a trend in international market in the last decade following the establishment of WTO in 1995. Lee (2005) claimed trade liberalization as "major driving force behind globalization" that will increase global trade flows in goods, services and investments by reducing, if not eliminating, trade barriers between borders. However, there are different perspectives towards practice of FTA between advance economy and developing countries. One side says that it will give developing countries' market more exposure to advance knowledge, increase economic growth, as well as trigger production innovation (Romer 1989; Ben-David and Loewy 1998; Amiti and Konings 2007; Lee 2014). Meanwhile, the other side contradicts it by arguing that FTA brings benefits solely to advance economies, while developing countries are left with minimum advantages and end up creating more inequality in their jurisdictions (Ibrahim et al. 2010; Faber 2012; Subramanian and Wei 2006).

This research then tries to examine trade agreement between Indonesia and Japan, the IJEPA, to see whether or not it affects Indonesia's trade flow. Using a self-developed gravity model, a panel data regression analysis is used to answer main research question and three sub research questions.

Main research question: '*How has the implementation of IJEPA affected Indonesia's export and import flow?*'.

Based on regression results and analysis in subsection 4.1.1, variable FTA1 that represents specific trade effect of IJEPA has significant positive impact on export values but significant negative impact on export values growth. It means that after the implementation of FTA in 2008, Indonesia's export values are increasing but the growth rate is less than before 2008. An analysis on import values in subsection 4.1.2 gives similar result where variable FTA1 gives significant positive effects on import values while also showing positive relationship with import values growth. This means that from 2008 onwards, Indonesia's import values are increasing and the growth rate is bigger than the previous years. This result is consistent with prior study by Setiawan (2012) that said IJEPA scheme increases both Indonesia and Japan export values (Setiawan 2012).

Furthermore, changes in Japanese tariffs give insignificant positive effect on Indonesia's export values while its growth rate poses a more significant positive effect on export values growth. This result is a bit off considering that export values should have decreased when tariffs increased. Referring back to export values and tariffs of each sector (Appendix I and Appendix IV), exported products with highest values --- sector 27 (mineral fuels, oils, distillation products, etc) and sector 26 (ores, slag and ash) --- always have zero percent tariffs even before the implementation of IJEPA. Since values of both sectors combined costs more than 60 percent of overall export values, it makes sense that effects of tariff changes on other sectors are overshadowed by these two sectors. Moreover, result shows that import values are affected significantly with noticeable negative coefficients by Indonesian tariffs, which means that when there is a small increase in import tariffs implied by Indonesia, overall import values experience a drastic drop. Then, for import values growth, increasing growth rate of tariffs also gives significant effect, albeit very small coefficient.

Meanwhile, variable GDPIJ that represents economic sizes of both countries always shows positive significant result except on import values growth. Result demonstrates that an increase in GDPIJ growth rate decreases the growth rate of import values. As mentioned in subsection 4.1.2, an argument

that can justify this result is that when growth rate of Indonesia's GDP increase, there will be more local industry development that makes Indonesia become less dependent to Japan in fulfilling demand of finished goods. Then, variable exchange rate gives positive impact on both export and import values while giving negative effect on both values' growth. However, it only offers significant effect on import values growth. It means that there is not enough evidence to state that exchange rater has any effect on export values, import values and export values growth. Lastly, variable quota only has significant effect on export and import values with different signs where its increase gives positive effect on export values, but rather negative impact on import values. While for the growth variables, none of them show significance level, thus, there is not enough evidence to prove that quota has an impact on those trade values growth rate.

Then, it can be concluded that FTA implementation poses positive effect on both export and import flows while rise in tariffs causes positive effect on export and negative effect on import.

First sub research question: '*How does IJEPA affect Indonesia's Trade Balance?*'

In answering this question, section 4.2 provides a regression result where the coefficient tells that FTA1 brings negative effect on trade balance, which means that after the implementation of IJEPA in 2008, increase in import values outbalanced export values. This result is parallel with prior studies by Subramanian and Wei (2006) that argued FTA benefited advance economies more than developing countries, and another study by Ibrahim et al (2010) that proves China gets more benefit compared to Indonesia in the scheme of ACFTA (Subramanian and Wei 2006; Ibrahim et al. 2010). Meanwhile, the increase of both tariffs gives negative effects on trade balance. However, *there are no independent variable except exchange rate whixh has significant effect on trade balance, which means that there is not enough evidence to prove those positive and negative signs are really happening.*

Second sub research question: '*Which sector of exported and imported products experienced the largest increase with tariff changes?*'

Table 11 in section 4.3 shows that *sector 85 (Electrical, electronic equipment)* has the highest increase in export values when tariffs change and *sector 33 (Essential oils, perfumes, cosmetics, toiletries)* experiences it with import values, as both numbers can go up to 8.9 and 9.8 folds sequentially when tariffs increase from the lowest to the highest.

Third sub research question: '*Which sector of exported and imported products experienced the largest drop with tariff changes?*'

Still using the data on Table 11, it says that the sectors that experience the worst drop with increase in tariffs are *sector 93 (Arms and ammunition, parts and accessories thereof)* with 600 percent fall in export values and *sector 2 (Meat and edible meat offal)* with 440 decline in import values.

Looking at how coefficients and signs from the results are sometimes counterintuitive, there are a lot of possible reasons behind it, such as:

1. Exported and imported products with high values might have inelastic demand, where changes in tariffs and agreement will not give material effects on these variables. Thus, it results in unpredictable coefficients and significance level.
2. Other external factor such as inflation rate, political issues, trade collapse and trade slowdown might have made quite an impact on export and import values that make the regression gives a counterintuitive result.
3. Indonesia and Japan clearly have a lot of other agreements with other countries, and trade related policies from those countries might have been a major consideration for Indonesian government to control exports and imports. For example, when the result said a rise in tariffs increases the

export values as well, it is possible that it is still considered cheaper than tariffs from other partner countries.

5.2 Implications and Recommendations

5.2.1 Implications

This study may provide an alternative in using gravity model to analyze bilateral trade agreement effect on trade flow. While there are countless studies focusing on multilateral agreement effect using gravity model, there are very limited similar research on bilateral agreement. The model that is often used in multilateral agreement studies, however, are not very appropriate to be adapted to bilateral deals since the independent variable related to different pairing of countries is not applicable when there are only two countries involved. Using product-specific independent variable rather than country-specific variables as in various studies, the self-developed gravity model in this study then might be able to serve as reference on further research about bilateral trade agreement effect. Moreover, it may be used as additional reference in predicting the impact of bilateral agreement in the future.

5.2.2 Recommendations for Future Policy

Although the implementation of IJEPA increases not only Indonesian import values but also export values, growth rate of the former is affected positively while latter's has a rather negative relationship. This result supports the arguments that FTA gives more benefit to wealthier countries. While there is still a need for deeper research to find the cause behind this result, this research might be able to give additional consideration for future trade policies. For instance, policy maker may pay more attention to exported products that have high elasticity on changes in tariffs and negotiate for immediate tariffs elimination on that products while doing the opposite for imported products with high elasticity.

Moreover, as implied on Table 9, variable that can decrease import growth is GDP growth. This means that policy makers might need to focus on boosting the economy and industry to supress the demand for imported products. While this variable has positive relationship with export growth and values, it will benefit Indonesia's export activities as well.

5.3 Future Research

Considering time and data source limitations, there are several things that cannot be fully addressed in this research. If there are any chances to continue this research in a PhD program or maybe someone else could be willing to take over this research, there are plenty of rooms for future study such as:

1. Rather than using two- digit HS Code identification, further studies can use six-digit HS Code instead to identify export and import commodities in more specific term as well as to eliminate the need of converting tariffs and quota data into two-digit format since both data are available in six-digit format.
2. Add another sector specific independent variable that is not a dummy variable such as price or government subsidy.
3. Instead of collecting non-tariff barriers into a single dummy variable such as quota in this research, future studies can use actual number of quota limitation from both countries as independent variable.

4. Since the implementation of IJEPA overlapped with global financial crisis, future studies can address this by adding specific variable or separate calculation to isolate this external factor.
5. As mentioned earlier in Chapter 4, Indonesia and Japan have trade activities and agreements with other partners besides each other. Future studies can look deeper into these trades and agreements as comparison to IJEPA or as possible cause behind counterintuitive results.

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Appendix I: Sectors' Descriptions and Values

List of 96 sectors used as space dimension in the panel data alongside total export and import values for each sector.

NO	SECTORS	TOTAL EXPORT VALUES (USD)	TOTAL IMPORT VALUES (USD)
1	Live animals	8,924,765.00	1,622,340.00
2	Meat and edible meat offal	25,526,023.00	823,967.00
3	Fish, crustaceans, Mollusca, aquatic invertebrates nes	12,972,727,519.00	211,810,220.00
4	Dairy products, eggs, honey, edible animal product nes	19,512,575.00	5,443,509.00
5	Products of animal origin, nes	24,093,920.00	2,105,585.00
6	Live trees, plants, bulbs, roots, cut flowers etc	68,912,803.00	1,261,837.00
7	Edible vegetables and certain roots and tubers	227,000,084.00	5,692,994.00
8	Edible fruit, nuts, peel of citrus fruit, melons	22,819,075.00	3,898,465.00
9	Coffee, tea, mate and spices	2,327,156,579.00	12,096,379.00
10	Cereals	31,078,843.00	249,505,489.00
11	Milling products, malt, starches, inulin, wheat gluten	66,944,246.00	85,896,999.00
12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	102,150,497.00	37,535,595.00
13	Lac, gums, resins, vegetable saps and extracts nes	89,436,039.00	24,624,133.00
14	Vegetable plaiting materials, vegetable products nes	176,511,806.00	568,336.00
15	Animal,vegetable fats and oils, cleavage products, etc	995,293,120.00	77,762,466.00
16	Meat, fish and seafood food preparations nes	1,570,484,145.00	5,697,235.00
17	Sugars and sugar confectionery	74,971,927.00	25,965,185.00
18	Cocoa and cocoa preparations	277,098,828.00	3,190,799.00
19	Cereal, flour, starch, milk preparations and products	128,018,933.00	27,235,937.00
20	Vegetable, fruit, nut, etc food preparations	274,189,003.00	13,758,005.00
21	Miscellaneous edible preparations	126,796,187.00	146,796,272.00
22	Beverages, spirits and vinegar	223,046,991.00	7,632,415.00
23	Residues, wastes of food industry, animal fodder	262,073,184.00	67,280,212.00
24	Tobacco and manufactured tobacco substitutes	53,070,367.00	1,627,372.00
25	Salt, sulphur, earth, stone, plaster, lime and cement	85,083,648.00	583,163,948.00
26	Ores, slag and ash	22,969,407,858.00	33,235,829.00
27	Mineral fuels, oils, distillation products, etc	198,710,552,537.00	1,397,419,632.00
28	Inorganic chemicals, precious metal compound, isotopes	1,041,102,981.00	1,602,646,958.00
29	Organic chemicals	3,166,107,529.00	7,331,906,165.00
30	Pharmaceutical products	501,826,612.00	245,553,956.00

NO	SECTORS	TOTAL EXPORT VALUES (USD)	TOTAL IMPORT VALUES (USD)
31	Fertilizers	134,039,544.00	149,955,500.00
32	Tanning, dyeing extracts, tannins, derivs,pigments etc	380,015,540.00	2,114,624,264.00
33	Essential oils, perfumes, cosmetics, toileteries	224,552,206.00	435,511,104.00
34	Soaps, lubricants, waxes, candles, modelling pastes	281,716,155.00	1,071,374,741.00
35	Albuminoids, modified starches, glues, enzymes	75,559,786.00	354,210,225.00
36	Explosives, pyrotechnics, matches, pyrophorics, etc	3,702,558.00	5,442,008.00
37	Photographic or cinematographic goods	2,646,907.00	521,755,105.00
38	Miscellaneous chemical products	1,000,589,670.00	2,121,885,300.00
39	Plastics and articles thereof	6,517,017,571.00	9,070,758,183.00
40	Rubber and articles thereof	15,696,636,309.00	6,967,026,341.00
41	Raw hides and skins (other than furskins) and leather	37,398,776.00	29,316,999.00
42	Articles of leather, animal gut, harness, travel goods	383,465,736.00	43,546,513.00
43	Furskins and artificial fur, manufactures thereof	981,713.00	784,138.00
44	Wood and articles of wood, wood charcoal	19,916,167,406.00	98,065,178.00
45	Cork and articles of cork	928,488.00	4,452,214.00
46	Manufactures of plaiting material, basketwork, etc.	182,017,458.00	630,351.00
47	Pulp of wood, fibrous cellulosic material, waste etc	1,226,663,219.00	282,619,692.00
48	Paper & paperboard, articles of pulp, paper and board	7,036,774,484.00	1,403,939,726.00
49	Printed books, newspapers, pictures etc	19,061,424.00	96,238,063.00
50	Silk	1,179,639.00	3,058,910.00
51	Wool, animal hair, horsehair yarn and fabric thereof	13,114,915.00	99,412,682.00
52	Cotton	2,391,606,497.00	235,065,157.00
53	Vegetable textile fibres nes, paper yarn, woven fabric	3,236,356.00	4,274,237.00
54	Manmade filaments	1,292,670,596.00	1,033,120,920.00
55	Manmade staple fibres	2,798,113,312.00	2,024,115,121.00
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	375,521,926.00	222,358,083.00
57	Carpets and other textile floor coverings	287,927,729.00	60,225,898.00
58	Special woven or tufted fabric, lace, tapestry etc	26,502,580.00	96,940,435.00
59	Impregnated, coated or laminated textile fabric	335,539,400.00	396,790,762.00
60	Knitted or crocheted fabric	58,353,958.00	206,500,139.00
61	Articles of apparel, accessories, knit or crochet	2,536,887,126.00	12,656,672.00
62	Articles of apparel, accessories, not knit or crochet	3,587,696,302.00	35,404,189.00

NO	SECTORS	TOTAL EXPORT VALUES (USD)	TOTAL IMPORT VALUES (USD)
63	Other made textile articles, sets, worn clothing etc	999,828,295.00	14,455,570.00
64	Footwear, gaiters and the like, parts thereof	2,785,831,857.00	19,829,655.00
65	Headgear and parts thereof	99,526,300.00	5,031,779.00
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	1,315,981.00	271,095.00
67	Bird skin, feathers, artificial flowers, human hair	32,454,102.00	13,054,112.00
68	Stone, plaster, cement, asbestos, mica, etc articles	145,345,542.00	728,014,154.00
69	Ceramic products	487,617,772.00	289,891,433.00
70	Glass and glassware	669,823,659.00	277,594,240.00
71	Pearls, precious stones, metals, coins, etc	4,748,330,473.00	303,081,626.00
72	Iron and steel	592,593,781.00	21,517,754,085.00
73	Articles of iron or steel	2,447,952,903.00	10,234,125,201.00
74	Copper and articles thereof	5,606,595,523.00	3,735,694,183.00
75	Nickel and articles thereof	15,666,416,304.00	161,085,635.00
76	Aluminium and articles thereof	4,814,447,107.00	1,131,461,562.00
78	Lead and articles thereof	23,301,112.00	314,361,948.00
79	Zinc and articles thereof	28,144,681.00	700,019,091.00
80	Tin and articles thereof	1,242,713,965.00	116,805,976.00
81	Other base metals, cermets, articles thereof	32,406,212.00	387,748,627.00
82	Tools, implements, cutlery, etc of base metal	121,617,752.00	1,724,675,380.00
83	Miscellaneous articles of base metal	469,945,766.00	783,948,524.00
84	Nuclear reactors, boilers, machinery, etc	11,779,687,117.00	65,467,297,916.00
85	Electrical, electronic equipment	21,133,400,376.00	21,514,737,847.00
86	Railway, tramway locomotives, rolling stock, equipment	11,658,212.00	158,844,308.00
87	Vehicles other than railway, tramway	5,742,713,813.00	31,451,385,360.00
88	Aircraft, spacecraft, and parts thereof	16,385,171.00	70,809,786.00
89	Ships, boats and other floating structures	86,455,504.00	2,241,854,684.00
90	Optical, photo, technical, medical, etc apparatus	893,974,080.00	4,439,847,848.00
91	Clocks and watches and parts thereof	132,314,576.00	25,936,359.00
92	Musical instruments, parts and accessories	1,666,301,852.00	715,975,254.00
93	Arms and ammunition, parts and accessories thereof	28,472,895.00	419,775.00
94	Furniture, lighting, signs, prefabricated buildings	4,176,214,827.00	504,741,750.00
95	Toys, games, sports requisites	495,646,978.00	1,622,340.00

NO	SECTORS	TOTAL EXPORT VALUES (USD)	TOTAL IMPORT VALUES (USD)
96	Miscellaneous manufactured articles	278,994,555.00	823,967.00
97	Works of art, collectors pieces and antiques	9,911,761.00	211,810,220.00

Data Source: United Nations Trade Statistics (2018)

Appendix II: Exchange Rate

List of exchange rate value from IMF and World Bank.

Year	Exchange Rate to USD		Nominal Exchange Rate*
	Indonesia	Japan	
1997	2,667.16	121.17	22.01
1998	11,323.33	131.02	86.42
1999	7,855.15	114.03	68.96
2000	8,421.78	107.94	78.15
2001	10,260.85	121.81	84.43
2002	9,174.48	124.55	73.66
2003	8,549.38	115.77	73.85
2004	8,979.13	108.32	82.89
2005	9,768.67	110.92	88.07
2006	9,135.32	116.36	78.51
2007	9,145.52	117.58	77.78
2008	9,705.39	103.02	94.21
2009	10,338.01	93.87	110.13
2010	9,074.79	87.55	103.65
2011	8,757.90	79.59	110.04
2012	9,391.37	79.94	117.48
2013	10,487.64	98.10	106.91
2014	11,861.88	105.69	112.24
2015	13,451.80	121.26	110.93
2016	13,263.20	108.10	122.69
2017	13,384.20	111.96	119.55

*Indonesian exchange rate/Japanese exchange rate

Data source: International Monetary Fund (2018); World Bank (2018[b])

Appendix III: Export-Import Subsector Weight

A. List of exported products subsector and their weight compare to total sector values

Sector	Subsector	Commodity	% of sector
1	10600	Animals, live, except farm animals	98%
2	20714	Fowls, cuts & offal, fro	96%
3	30613	Shrimps and prawns, frozen	73%
4	40229	Milk and cream powder sweetened > 1.5% fat	36%
4	40210	Milk powder < 1.5% fat	19%
5	50800	Coral, seashell, cuttle bone, etc, unworked, powder, waste	59%
6	60310	Cut flowers and flower buds for bouquets, etc., fresh	22%
6	60290	Plants live, mushroom sp	20%
6	60210	Cuttings and slips, not rooted	10%
7	70930	Aubergines (egg-plants), fresh or chilled	32%
7	70490	Edible brassicas nes, fresh or chilled	20%
7	71420	Sweet potatoes, fresh or dried	19%
8	80720	Papaws (papayas), fresh	38%
8	80719	Melons, fresh	22%
8	80132	Cashew nuts, shelled dri	18%
8	80119	Coconuts, fresh, shelled	9%
9	90111	Coffee, not roasted, not decaffeinated	83%
9	90411	Pepper of the genus Piper, whole	5%
10	100590	Maize except seed corn	92%
10	100510	Maize (corn) seed	6%
11	110290	Cereal flour except wheat, meslin, rye, maize, rice	57%
12	121220	Seaweeds and other algae,	77%
13	130190	Natural gum, resin, gum-resin, balsam, not gum arabic	81%
14	140490	Vegetable products nes	53%
15	152000	Glycerol crude; glyc wat	38%
15	151590	Veg fats, oils nes, fractions, not chemically modified	27%
16	160414	Tuna, skipjack, bonito, prepared/preserved, not minced	93%
17	170490	Sugar confectionery not chewing gum, no cocoa content	86%
18	180400	Cocoa butter, fat, oil	70%
19	190219	Uncooked pasta, not stuffed or prepared, without eggs	27%
19	190230	Pasta except uncooked or stuffed	26%
20	200820	Pineapples, otherwise prepared or preserved	47%
20	200490	Vegetables nes and mixtures, prepared, frozen	32%
21	210111	Coffee extracts, essence	52%
21	210390	Sauces nes, mixed condiments, mixed seasoning	16%
21	210320	Tomato ketchup and other tomato sauces	6%
22	220710	Undenatured ethyl alcohol > 80% by volume	89%

Sector	Subsector	Commodity	% of sector
23	230230	Wheat bran, sharps, other residues	53%
23	230120	Flour or meal, pellet, fish, etc, for animal feed	20%
24	240220	Cigarettes containing tobacco	86%
25	250700	Kaolin and other kaolinic clays	44%
25	250100	Salt (sodium chloride) including solution, salt water	27%
26	260300	Copper ores and concentrates	89%
27	271111	Natural gas, liquefied	57%
27	270900	Petroleum oils, oils from bituminous minerals, crude	26%
28	281410	Anhydrous ammonia	86%
28	282733	Iron chlorides	5%
29	290511	Methyl alcohol	23%
29	292242	Glutamic acid, salts	20%
29	290544	D-glucitol (sorbitol)	14%
30	300410	Penicillins and streptomycins, derivs, in dosage	63%
30	300420	Antibiotics nes, in dosage	22%
31	310210	Urea, including aqueous solution in packs >10 kg	50%
31	310100	Animal or vegetable fertilizers, in packs >10 kg	38%
31	310250	Sodium nitrate, in packs >10 kg	8%
32	320417	Synthetic organic pigments and preps based thereon	47%
32	320416	Reactive dyes and preparations based thereon	17%
32	320411	Disperse dyes and preparations based thereon	17%
32	320820	Acrylic or vinyl polymer paint or varnish, non-aqueous	11%
33	330590	Hair preparations, nes	39%
33	330210	Mixed odoriferous substances - food & drink industries	21%
33	330510	Hair shampoos	6%
34	340220	Washing and cleaning preparations, retail	47%
34	340111	Soaps, for toilet use, solid	29%
34	340290	Organic surfactant washing, cleaning preparations nes	12%
34	340211	Anionic surface-active agents	5%
35	350510	Dextrins and other modified starches	66%
35	350520	Glues based on starches, or modified starches	6%
36	360610	Lighter refill fuels (pack < 300 cc)	41%
36	360690	Pyrophoric alloys, firelighters, etc	28%
37	370110	X-ray plates and films	99%
38	381800	Chemical element/compound wafers doped for electronics	67%
38	380210	Activated carbon	9%
39	390760	Polyethylene terephthalate, in primary forms	32%
39	392321	Sacks & bags (including cones) of polymers of ethylene	14%
39	392310	Boxes, cases, crates etc. of plastic	12%
40	400122	Technically specified natural rubber (TSNR)	61%

Sector	Subsector	Commodity	% of sector
40	401110	Pneumatic tyres new of rubber for motor cars	16%
40	400129	Natural rubber in other forms	6%
41	410729	Reptile leather, other than vegetable pre-tanned	27%
41	410520	Sheep or lamb skin leather, nes	26%
41	410320	Reptile skins, raw	20%
42	420212	Trunks, suit-cases, etc, outer surface plastic/textile	43%
42	420321	Leather, composition sports gloves, mittens and mitts	26%
42	420222	Handbags with outer surface plastics, textile material	7%
42	420292	Containers nes, outer surface plastic or textile	7%
42	420211	Trunks, suit-cases/etc, outer surface leather	6%
43	430390	Articles of furskin except clothing and accessories	60%
44	441213	Plywood, outer ply of tr	57%
44	441219	Plywood, all softwood, each ply < 6mm thick	8%
44	441890	Builder's joinery and carpentry of wood nes	5%
45	450200	Natural cork, debacked, roughly squared, in blocks etc	74%
45	450490	Articles of agglomerated cork	18%
45	450410	Blocks, sheets, strip and tiles of agglomerated cork	7%
46	460120	Mats, matting and screens, vegetable plaiting material	57%
46	460210	Basketwork, wickerwork products of vegetable material	40%
47	470329	Chem wood pulp, soda/sulphate, non-conifer, bleached	98%
48	482359	Paper, fine, cut to size or shape, nes	64%
48	480252	Paper, fine, woodfree, 40 - 150 g/m2, uncoated	12%
48	482311	Paper, self-adhesive, cut to size, in strips or rolls	5%
49	490810	Transfers (decalcomanias), vitrifiable	40%
49	490191	Dictionaries and encyclopedias	18%
49	490110	Brochures, leaflets and similar, in single sheets	10%
49	490199	Printed reading books, except dictionaries etc	7%
50	500710	Woven fabric of noil silk	53%
51	510310	Noils of wool or of fine animal hair	66%
51	510111	Greasy shorn wool, not carded or combed	32%
52	520524	Cotton yarn >85% single combed 192-125 dtex, not ret.	19%
52	520812	Plain weave cotton, >85% 100-200g/m2, unbleached	16%
52	520521	Cotton yarn >85% single combed >714dtex, not retail	14%
52	520522	Cotton yarn >85% single combed 714-232 dtex,not retail	11%
52	520822	Plain weave cotton, >85% 100-200g/m2, bleached	5%
53	530310	Jute and other textile bast fibres, raw or retted	82%
54	540243	Yarn, polyester, single, untwisted nes, not retail	35%
54	540710	Woven hi-ten filament, nylon, polyamide or polyester	26%
54	540233	Textured yarn nes, of polyester filaments, not retail	7%
54	540210	Hi-ten yarn of nylon, polyamide, not sewing or retail	6%

Sector	Subsector	Commodity	% of sector
55	550932	Yarn >85% acrylic staple fibres, multiple not retail	13%
55	550953	Yarn of polyester & cotton, not retail, nes	11%
55	550951	Yarn of polyester & artif staple fibres, not retail	9%
55	550961	Yarn of acrylic staple fibre & wool or hair,not retail	9%
55	551011	Yarn >85% artificial staple fibres, single, not retail	9%
55	551611	Woven fabric <85% artif staple fibres, unbl/bleached	9%
55	551311	Woven plain >85% polyester+cotton, <170g/m2 unbl/blchd	5%
56	560811	Made up fishing nets, of manmade textile materials	43%
56	560391	Nonwovens, w/n imprg<25	31%
57	570500	Carpets and textile floor coverings, nes	56%
58	580620	Woven fabric, elasticised, < 30 cm wide	71%
58	580610	Woven pile fabric and narrow chenille fabric	14%
59	590610	Rubberised textile adhesive tape < 20cm wide	46%
59	591190	Textile products and articles for technical uses, nes	22%
60	600192	Pile knit or crochet fabric, of manmade fibres, nes	45%
60	600210	Knit or crochet fabric, width <30 cm, >5% elastomer	19%
60	600291	Knit, crochet fabric of wool or fine animal hair, nes	13%
60	600293	Knit or crochet fabric of manmade fibres, nes	8%
60	600242	Warp knit fabric of cotton, nes	8%
61	610910	T-shirts, singlets and other vests, of cotton, knit	20%
61	611592	Hosiery nes, of cotton, knit	15%
61	611699	Gloves, mittens or mitts, nes, material nes knit	11%
61	610990	T-shirts, singlets etc, of material nes, knit	7%
61	610510	Mens, boys shirts, of cotton, knit	6%
62	620520	Mens, boys shirts, of cotton, not knit	18%
62	621010	Garments made up of textile felts and nonwoven fabric	8%
62	621111	Mens, boys swimwear, not knit	8%
62	620899	Womens, girls panties, bathrobes, etc, nes not knit	7%
62	620829	Womens girls nightdress, pyjama, material nes not knit	5%
62	620342	Mens, boys trousers & shorts, of cotton, not knit	4%
62	620343	Mens, boys trousers shorts, synthetic fibre, not knit	3%
63	630533	Sacks&bags,f/pckg polyet	32%
63	630260	Toilet or kitchen linen, of cotton terry towelling	29%
63	630532	Sacks&bags,f/pckg,flexib	21%
64	640319	Sports footwear, except ski, uppers of leather	51%
64	640411	Sports footwear, sole rubber or plastic, upper textile	29%
65	650590	Hats and other headgear, knit or crochet, nes	74%
65	650510	Hair-nets of any material	10%
66	660199	Umbrellas nes, not with telescopic shaft	53%
66	660110	Garden and similar umbrellas	36%

Sector	Subsector	Commodity	% of sector
67	670420	Wigs, false beards, eyebrows etc, of human hair	57%
67	670290	Artificial flowers foliage fruit etc except plastic	14%
67	670210	Artificial flowers foliage fruit, articles, plastic	13%
67	670490	Wigs, false beards, eyebrows etc, of other materials	11%
68	681310	Asbestos brake linings and pads	30%
68	680210	Stone mosaic tiles, artificial coloured chips etc	12%
68	681120	Sheet/tile, asbestos/cellulose fibre cement not corrug	12%
68	681091	Prefabricated structural items of cement or concrete	10%
68	680291	Worked marble, travertine and alabaster	6%
69	690911	Porcelain ware for laboratory, chemical, technical use	49%
69	691010	Porcelain bathroom, kitchen & other sanitary fixtures	14%
69	691090	Ceramic bathroom kitchen sanitary items not porcelain	5%
70	701399	Glassware, not kitchen or table ware, not lead crystal	37%
70	700521	Float glass etc sheets, coloured throughout	21%
71	710121	Pearls cultured unworked	70%
71	710122	Pearls cultured worked, not mounted or set	12%
71	710110	Pearls natural, not permanently mounted or set	6%
72	720836	Flat rld prod/coils<10mm	36%
72	720260	Ferro-nickel	19%
73	730890	Structures and parts of structures, iron or steel, nes	14%
73	731511	Chain, roller, iron or steel	12%
73	732690	Articles of iron or steel, nes	12%
73	732010	Leaf springs/leaves thereof, iron or steel	11%
73	731029	Cans, iron or steel, capacity <50 litres nes	10%
74	740319	Refined copper products, unwrought, nes	94%
75	750110	Nickel mattes	100%
76	760110	Aluminium unwrought, not alloyed	79%
76	760120	Aluminium unwrought, alloyed	5%
78	780199	Lead unwrought nes	80%
79	790700	Articles of zinc, nes	56%
79	790111	Zinc, not alloyed, unwrought, >99% pure	14%
80	800400	Tin plates, sheets and strips, thickness > 0.2 mm	79%
81	810890	Titanium, articles thereof, nes	71%
81	810110	Powders, tungsten (wolfram)	7%
81	810192	Tungsten profiles, sheet or foil, not simply sintered	6%
81	810810	Titanium, unwrought, waste or scrap, powders	5%
82	820750	Tools for drilling, other than for rock drilling	25%
82	820790	Screwdriver bits and other interchangeable tools	16%
82	820720	Dies for drawing or extruding metal	10%
83	830241	Mountings, fittings, of base metal, for buildings, nes	52%

Sector	Subsector	Commodity	% of sector
83	830249	Mountings, fittings, of base metal, nes	27%
84	847330	Parts and accessories of data processing equipment nes	34%
84	847160	I/O units w/n storage u	21%
84	840734	Engines, spark-ignition reciprocating, over 1000 cc	11%
85	852540	Still image video camara	14%
85	854430	Ignition/other wiring sets for vehicles/aircraft/ship	7%
85	853690	Electrical switch, protector, connecter for < 1kV nes	6%
85	852190	Video record/reproduction apparatus not magnetic tape	5%
85	852812	Color television receive	4%
85	852990	Parts for radio/tv transmit/receive equipment, nes	3%
85	854459	Electric conductors, 80-1,000 volts, no connectors	3%
85	854150	Semiconductor devices, not light sensitive or emitting	3%
85	851829	Loudspeakers, nes	2%
85	854160	Mounted piezo-electric crystals	2%
85	854420	Co-axial cable and other co-axial electric conductors	2%
86	860110	Rail locomotives, externally electrically powered	68%
86	860400	Railway maintenance-of-way service vehicles	10%
87	870870	Wheels including parts/accessories for motor vehicles	44%
87	870899	Motor vehicle parts nes	12%
87	870894	Steering wheels, columns & boxes for motor vehicles	9%
87	870891	Radiators for motor vehicles	8%
87	870893	Clutches and parts thereof for motor vehicles	6%
87	870850	Drive axles with differential for motor vehicles	5%
88	880520	Flight simulators, parts thereof	52%
88	880330	Aircraft parts nes	25%
88	880390	Parts of balloons, dirigibles, spacecraft	22%
89	890110	Cruise ships, excursion boats, ferry boats	75%
89	890800	Vessels and other floating structures for breaking up	18%
90	900653	Cameras for 35 mm roll film except single lens reflex	35%
90	900130	Contact lenses	15%
91	911390	Watch straps etc and parts, of leather/plastic/etc	36%
91	910529	Wall clocks, non-electric	21%
92	920710	Keyboard instruments electrical/requiring amplifier	38%
92	920999	Parts and accessories for the musical instruments nes	17%
92	920991	Parts and accessories for pianos	15%
93	930700	Swords, cutlasses, bayonets, lances, scabbards, etc	72%
93	930310	Muzzle-loading firearms	14%
94	940360	Furniture, wooden, nes	30%
94	940150	Seats of cane, osier, bamboo or similar materials	13%
94	940380	Furniture of cane, materials nes	10%

Sector	Subsector	Commodity	% of sector
94	940350	Bedroom furniture, wooden, nes	9%
94	940180	Seats nes	9%
94	940330	Office furniture, wooden, nes	8%
94	940390	Furniture parts nes	7%
95	950710	Fishing rods	56%
96	960321	Tooth brushes	19%
96	960720	Parts of slide fasteners	18%
96	960719	Slide fasteners, nes	15%
96	960310	Brooms/brushes of vegetable material	13%
96	960329	Shaving, hair, nail, eyelash and other toilet brushes	7%
97	970110	Paintings/drawings/pastels executed by hand	38%
97	970190	Collages, similar decorative plaques	30%
97	970300	Original sculptures and statuary, in any material	20%

Data source: United Nations Trade Statistics (2018)

B. List of imported products subsector and their weight compare to total sector values

Sector	Subsector	Commodity	% of sector
1	10392	Swine, live except pure-bred breeding > 50 kg	100%
2	20629	Bovine edible offal, frozen except livers and tongues	43%
2	20110	Bovine carcasses and half carcasses, fresh or chilled	25%
2	20410	Lamb carcasses and half carcasses, fresh or chilled	15%
2	20230	Bovine cuts boneless, frozen	9%
3	30420	Fish fillets, frozen	17%
3	30379	Fish nes, frozen, whole	14%
3	30269	Fish nes, fresh or chilled, whole	12%
3	30110	Ornamental fish, live	9%
3	30376	Eels, frozen, whole	7%
3	30343	Skipjack,stripe-bellied bonito, frozen, whole	5%
3	30410	Fish fillet or meat, fresh or chilled, not liver, roe	5%
4	40229	Milk and cream powder sweetened > 1.5% fat	31%
4	40299	Milk and cream nes sweetened or concentrated	28%
4	40900	Honey, natural	23%
5	50800	Coral, seashell, cuttle bone, etc, unworked, powder, waste	100%
6	60290	Plants live, mushroom sp	51%
6	60210	Cuttings and slips, not rooted	48%
7	70190	Potatoes, fresh or chilled except seed	53%
7	70951	Mushrooms, fresh or chilled	26%
8	80810	Apples, fresh	46%
8	80122	Brazil nuts, shelled dri	36%

Sector	Subsector	Commodity	% of sector
9	91099	Spices nes	53%
9	91050	Curry	12%
10	100630	Rice, semi-milled or wholly milled	99%
11	110811	Wheat, starch	29%
11	110100	Wheat or meslin flour	27%
11	110812	Maize (corn) starch	9%
12	120991	Seed, vegetable, nes for sowing	44%
12	121190	Plants & parts, pharmacy, perfume, insecticide use nes	16%
12	121120	Ginseng roots	5%
13	130239	Mucilages and thickeners nes	44%
13	130219	Vegetable saps and extracts nes	30%
13	130232	Mucilages & thickeners, from locust bean, guar seeds	5%
14	140290	Veg mat nes usd as stuff	44%
14	140490	Vegetable products nes	31%
14	140410	Raw vegetable materials for dyeing or tanning	21%
15	151800	Processed animal, vegetable oils, industrial preps nes	73%
16	160419	Fish nes, prepared or preserved, not minced	40%
16	160420	Fish prepared or preserved, except whole, in pieces	19%
17	170290	Sugar nes, invert sugar, caramel and artificial honey	56%
17	170211	Lactose & syrup,99% lact	12%
17	170260	Fructose, syrup > 50% fructose, not pure fructose	7%
18	180690	Chocolate/cocoa food preparations nes	54%
18	180400	Cocoa butter, fat, oil	46%
19	190590	Communion wafers, rice paper, bakers wares nes	19%
19	190219	Uncooked pasta, not stuffed or prepared, without eggs	17%
19	190211	Uncooked egg pasta not stuffed or prepared	17%
19	190230	Pasta except uncooked or stuffed	6%
19	190530	Sweet biscuits, waffles and wafers	5%
20	200920	Grapefruit juice, not fermented or spirited	35%
20	200980	Single fruit, veg juice nes, not fermented or spirited	6%
20	200919	Orange juice, not fermented, spirited, or frozen	6%
20	200990	Mixtures of juices not fermented or spirited	5%
20	200930	Citrus juice nes (one fruit) not fermented or spirited	5%
21	210390	Sauces nes, mixed condiments, mixed seasoning	29%
21	210690	Food preparations nes	25%
21	210610	Protein concentrates and textured protein substances	25%
21	210310	Soya sauce	8%
22	220900	Vinegar and substitutes for vinegar from acetic acid	63%
23	230120	Flour or meal, pellet, fish, etc, for animal feed	46%
23	230990	Animal feed preparations nes	40%

Sector	Subsector	Commodity	% of sector
24	240120	Tobacco, unmanufactured, stemmed or stripped	98%
25	250300	Sulphur of all kinds, o/	58%
25	250510	Silica sands and quartz sands	13%
26	261900	Waste, scale, dross, slag of iron or steel industry	70%
27	271000	Petroleum oils&oils obta	61%
27	270810	Pitch	16%
27	270820	Pitch coke	10%
28	282010	Manganese dioxide	25%
28	280300	Carbon (carbon blacks and other forms of carbon, nes)	7%
28	281830	Aluminium hydroxide	5%
28	282300	Titanium oxides	5%
28	281820	Aluminium oxide, except artificial corundum	5%
28	283650	Calcium carbonate	4%
28	281122	Silicon dioxide	4%
29	290243	P-xylene	18%
29	293371	6-hexanelactam (epsilon-captolactam)	10%
29	292910	Isocyanates	5%
29	290121	Ethylene	4%
29	290220	Benzene	4%
29	291521	Acetic acid	4%
29	290531	Ethylene glycol (ethanediol)	4%
29	290321	Vinyl chloride (chloroethylene)	3%
30	300490	Medicaments nes, in dosage	49%
30	300420	Antibiotics nes, in dosage	7%
31	310221	Ammonium sulphate, in packs >10 kg	76%
31	310250	Sodium nitrate, in packs >10 kg	5%
32	320417	Synthetic organic pigments and preps based thereon	21%
32	320611	Pigments & prep/80% tita	9%
32	320810	Polyester based paints, varnishes, non-aqueous medium	8%
32	320411	Disperse dyes and preparations based thereon	7%
32	320890	Polymer based paint, varnish in non-aqueous medium nes	5%
32	320416	Reactive dyes and preparations based thereon	4%
32	320710	Pigment, opacifier, colours etc for ceramics or glass	3%
33	330290	Mixed odoriferous substances - industrial use nes	50%
33	330210	Mixed odoriferous substances - food & drink industries	35%
34	340391	Lubricants etc, no petroleum oil, textile, leather use	21%
34	340213	Non-ionic surface active agents	17%
34	340319	Lubricating oil etc containing <70% petroleum oil nes	15%
34	340311	Lubricant <70% petroleum oil, textile or leather use	11%
34	340211	Anionic surface-active agents	9%

Sector	Subsector	Commodity	% of sector
34	340290	Organic surfactant washing, cleaning preparations nes	7%
35	350691	Adhesives based on rubber or plastic, package >1 kg	43%
35	350790	Enzymes nes, prepared enzymes nes, except rennet	14%
35	350699	Glues or adhesives, prepared nes, package > 1kg	11%
35	350610	Glues and adhesives of all kinds, package <1 kg	7%
36	360690	Pyrophoric alloys, firelighters, etc	94%
37	370241	Colour film in rolls, width >610mm, length > 200m	33%
37	370310	Unexposed photographic paper,textile roll > 610mm wide	26%
38	382490	Chemical prep, allied in	21%
38	380991	Finishing agents, dye carriers, dressing, mordants nes	12%
38	381512	Supported catalysts, precious metal based	9%
38	380992	Finishing agents & dye carriers - paper industry	8%
39	390210	Polypropylene in primary forms	11%
39	390330	Acrylonitrile-butadiene-styrene (ABS) copolymers	6%
39	390530	Polyvinyl alcohol wether	5%
39	390230	Propylene copolymers in primary forms	5%
39	390720	Polyethers nes, in primary forms	5%
39	390110	Polyethylene - specific gravity <0.94 in primary forms	4%
39	390130	Ethylene-vinyl acetate copolymers in primary forms	3%
39	390760	Polyethylene terephthalate, in primary forms	3%
39	390190	Polymers of ethylene nes, in primary forms	3%
39	390120	Polyethylene - specific gravity >0.94 in primary forms	2%
39	390730	Epoxide resins, in primary forms	2%
40	401693	Gaskets, washers and other seals of vulcanised rubber	15%
40	401699	Articles of vulcanised rubber nes, except hard rubber	13%
40	401199	Pneumatic tyres new of rubber nes	12%
40	401191	Pneumatic tyres new of rubber nes, herring-bone tread	5%
40	400219	Styrene-butadiene rubber (SBR/XSBR) except latex	4%
40	400249	Chloroprene (chlorobutadiene) rubber (CR) except latex	4%
40	401110	Pneumatic tyres new of rubber for motor cars	4%
41	410410	Bovine skin leather, whole	34%
41	410431	Bovine and equine leather, full or split grain, nes	30%
41	411100	Composition leather, in slabs, sheets or strip	24%
42	420500	Articles of leather and composition leather, nes	93%
43	430230	Tanned or dressed whole furskins and pieces, assembled	29%
43	430219	Tanned,dressed whole furs except lamb/mink/rabbit/hare	26%
43	430212	Tanned, dressed rabbit, hare skins, whole, unassembled	13%
44	440890	Veneer,ply sheet, not conifer or tropical, <6 mm thick	50%
45	450410	Blocks, sheets, strip and tiles of agglomerated cork	59%
46	460120	Mats, matting and screens, vegetable plaiting material	62%

Sector	Subsector	Commodity	% of sector
46	460199	Products of non-vegetable plaiting materials	12%
47	470329	Chem wood pulp, soda/sulphate, non-conifer, bleached	50%
47	470730	Waste or scrap of paper or board of mechanical pulp	32%
47	470710	Waste or scrap of unbleached kraft or paperboard	10%
48	481190	Paper, coated/impregnated/covered/coloured/printed nes	17%
48	481011	Paper, fine, woodfree, <150 g/m2, clay coated	14%
48	480252	Paper, fine, woodfree, 40 - 150 g/m2, uncoated	10%
48	481099	Paper, clay coated, nes	5%
48	481029	Paper, fine, wood containing clay coated, except light	4%
48	480251	Paper, fine, woodfree, <40 g/m2, uncoated, nes	3%
49	490110	Brochures, leaflets and similar, in single sheets	20%
49	490199	Printed reading books, except dictionaries etc	16%
49	491110	Trade advertising material, catalogues etc.	15%
49	491199	Printed matter, nes	11%
50	500720	Woven fabric >85% silk (except noil silk)	55%
50	500790	Woven fabric of silk, nes	18%
51	511219	Woven fabric, >85% combed wool or fine hair, >300 g/m2	38%
51	511230	Woven fabric, combed wool or hair + manmade staple fib	15%
51	511211	Woven fabric, >85% combed wool or fine hair, <300 g/m2	12%
51	511290	Woven fabric, combed wool or hair with natural fibres	11%
52	520100	Cotton, not carded or combed	51%
52	520842	Plain weave cotton, >85% 100-200g/m2, yarn dyed	7%
52	520832	Plain weave cotton, >85% 100-200g/m2, dyed	7%
52	520843	Twill weave cotton, >85% <200g/m2, yarn dyed	6%
53	530911	Woven fabric, >85% flax, unbleached or bleached	85%
53	530919	Woven fabric, >85% flax, except unbleached or bleached	7%
54	540342	Yarn, cellulose acetate, multiple, nes, not retail	54%
54	540210	Hi-ten yarn of nylon, polyamide, not sewing or retail	10%
54	540243	Yarn, polyester, single, untwisted nes, not retail	6%
54	540220	Hi-ten yarn, polyester filament, not sewing or retail	5%
55	550330	Staple fibres of acrylic, modacrylic,not carded/combed	65%
55	550130	Filament tow of acrylic or modacrylic	15%
56	560311	Nonwovens, man-made fila	33%
56	560314	Nonwovens, man-made fila	18%
56	560312	Nonwovens, man-made fila	7%
57	570500	Carpets and textile floor coverings, nes	74%
58	580610	Woven pile fabric and narrow chenille fabric	19%
58	580632	Woven fabric manmade fibres, nes, < 30 cm wide	18%
58	580710	Label, badge, etc, of woven textile not embroidered	16%
58	580122	Cut corduroy cotton fabric, width > 30cm	13%

Sector	Subsector	Commodity	% of sector
59	590320	Fabric impregnated, coated, covered with polyurethane	34%
59	591131	Textile fabric used in paper-making etc, <650 g/m2	14%
59	591132	Textile fabric used in paper-making etc, >650 g/m2	13%
59	591190	Textile products and articles for technical uses, nes	10%
59	591110	Textile fabric for card clothing, technical use	5%
60	600243	Warp knit fabric of manmade fibres, nes	27%
60	600299	Knit or crochet fabric of other materials, nes	12%
60	600293	Knit or crochet fabric of manmade fibres, nes	11%
60	600241	Warp knit fabric of wool or fine animal hair, nes	9%
60	600230	Knit or crochet fabric, width > 30 cm, >5% elastomer	8%
60	600242	Warp knit fabric of cotton, nes	7%
60	600292	Knit or crochet fabric of cotton, nes	6%
61	610712	Mens, boys underpants or briefs, manmade fibre, knit	40%
61	610821	Womens, girls briefs or panties, of cotton, knit	22%
62	620899	Womens, girls panties, bathrobes, etc, nes not knit	61%
63	630900	Worn clothing and other worn articles	23%
63	630629	Tents, of textile material nes	22%
63	630533	Sacks&bags,f/pckg polyet	21%
63	630590	Sacks & bags, packing, of materials nes	10%
63	630619	Tarpaulins, awnings and sunblinds, of material nes	5%
64	640191	Waterproof footwear(Wellington) no toe cap, over knee	87%
65	650700	Parts for hats and headgear	67%
66	660199	Umbrellas nes, not with telescopic shaft	100%
67	670210	Artificial flowers foliage fruit, articles, plastic	97%
68	681390	Asbestos friction material, articles except for brakes	25%
68	680422	Grindstones etc, agglomerated abrasives or ceramics	17%
68	681310	Asbestos brake linings and pads	7%
68	680410	Stones for milling, grinding or pulping	5%
69	690220	Refractory bricks etc >50% alumina or silica	34%
69	690290	Refractory bricks etc nes	23%
69	690919	Ceramic laboratory & technical ware except porcelain	14%
69	690390	Refractory ceramic articles nes	10%
70	700910	Rear-view mirrors for vehicles	29%
70	701810	Ornamental glass beads, pearls, stones, worked items	9%
70	700232	Tubes of low expansion glass (Pyrex etc)	9%
70	701931	Mats of glass fibres	6%
70	701919	Slivers, of glass fibres	6%
70	701912	Rovings, of glass fibres	5%
71	710691	Silver in unwrought forms	65%
71	710813	Gold, semi-manufactured forms, non-monetary	29%

Sector	Subsector	Commodity	% of sector
72	720917	Flat rld prod/coils<.5<1	14%
72	720827	Flat rld prod/coils>3mm	6%
72	720839	Flat rld prod/coils>3mm	6%
72	720918	Flat rld prod/coils>.5mm	5%
72	720916	Flat rld prod/coils<1>3m	5%
72	722519	Flat rl p of silicon-el	5%
72	721030	Flat rld prod elctr zinc	4%
72	721049	Flat rolled i/nas, coated with zinc, width >600mm, nes	4%
72	720851	Flat rld prod n/coils<10	4%
72	721050	Flat rolled i/nas, coated chromium/oxides, w> 600 mm	3%
73	731815	Bolts/screws nes, with/without nut/washer, iron/steel	16%
73	731829	Non-threaded articles of iron or steel, nes	8%
73	730429	Casings,tubing u in dril	7%
73	731816	Nuts, iron or steel	6%
73	730820	Towers and lattice masts, iron or steel	6%
73	732690	Articles of iron or steel, nes	5%
73	731822	Washers, iron or steel, except spring/lock	5%
74	740311	Copper cathodes and sections of cathodes unwrought	41%
74	741110	Pipes or tubes, refined copper	9%
74	741129	Pipes or tubes, copper alloy except nickel/zinc alloys	6%
75	750890	Articles of nickel, nes	30%
75	750620	Plates, sheet, strip and foil, nickel alloy	20%
75	750610	Plates, sheet, strip and foil, nickel, not alloyed	8%
76	760120	Aluminium unwrought, alloyed	26%
76	760612	Aluminium alloy rectangular plate/sheet/strip,t >0.2mm	23%
76	760110	Aluminium unwrought, not alloyed	7%
78	780110	Lead refined unwrought	61%
78	780191	Lead unwrought containing mostly antimony	17%
78	780199	Lead unwrought nes	5%
79	790112	Zinc, not alloyed, unwrought, <99% pure	67%
79	790111	Zinc, not alloyed, unwrought, >99% pure	23%
80	800300	Tin bars, rods, profiles and wire	42%
80	800120	Tin alloys unwrought	19%
80	800110	Tin not alloyed unwrought	18%
81	810890	Titanium, articles thereof, nes	85%
82	820790	Screwdriver bits and other interchangeable tools	18%
82	820730	Tools for pressing, stamping or punching	15%
82	820820	Blades for wood working machines	14%
82	820719	Rock drillg nes & parts	12%
82	820810	Blades for metal working machines	7%

Sector	Subsector	Commodity	% of sector
82	820890	Blades for leather, paper, tobacco etc. industries	5%
83	830120	Locks of a kind used for motor vehicles of base metal	31%
83	830230	Motor vehicle mountings, fittings, of base metal, nes	17%
83	830210	Hinges of base metal	10%
83	830160	Lock parts, etc, of base metal,	6%
84	840991	Parts for spark-ignition engines except aircraft	14%
84	841330	Fuel, lubricating and cooling pumps for motor engines	5%
84	840734	Engines, spark-ignition reciprocating, over 1000 cc	4%
84	843149	Parts of cranes, work-trucks, shovels, constr machine	4%
84	848310	Transmission shafts and cranks, cam and crank shafts	4%
84	840999	Parts for diesel and semi-diesel engines	3%
84	842952	Shovels and excavators with revolving superstructure	3%
84	847780	Rubber or plastic working machines, nes	2%
84	848340	Gearing, ball screws, speed changers, torque converter	2%
85	851190	Parts of electrical ignition or starting equipment	9%
85	853690	Electrical switch, protector, connecter for < 1kV nes	7%
85	851130	Distributors and ignition coils	6%
85	851150	Generators and alternators	4%
85	852520	Transmit-receive apparatus for radio, TV, etc.	3%
85	853650	Electrical switches for < 1,000 volts, nes	3%
85	854511	Carbon and graphite furnace electrodes	3%
85	850213	Generating sets, diesel, output > 375 kVA	3%
85	851750	Apparatus for carrier-cu	3%
85	853400	Electronic printed circuits	3%
85	851220	Lighting/visual signalling equipment nes	2%
85	852510	Transmission apparatus for radio, telephone and TV	2%
85	851290	Parts of cycle & vehicle light, signal, etc equipment	2%
85	853641	Electrical relays for < 60 volts	1%
86	860719	Railway & tramway axles, wheels and parts	89%
86	860711	Railway & tramway driving bogies & bissel-bogies	5%
87	870899	Motor vehicle parts nes	58%
87	871419	Motorcycle parts except saddles	16%
88	880390	Parts of balloons, dirigibles, spacecraft	98%
89	890190	Cargo vessels other than tanker or refrigerated	58%
89	890110	Cruise ships, excursion boats, ferry boats	16%
89	890510	Dredgers	9%
89	890120	Tankers	9%
89	890590	Floating docks, special function vessels nes	6%
90	902990	Parts and accessories of revolution counters, etc	13%
90	901010	Equipment for automatic development of photo film	9%

Sector	Subsector	Commodity	% of sector
90	903180	Measuring or checking equipment, nes	8%
90	903289	Automatic regulating/controlling equipment nes	6%
90	900912	Electrostatic photo-copyers, indirect process	4%
90	902610	Equipment to measure or check liquid flow or level	4%
90	902920	Speed indicators, tachometers, stroboscopes	2%
90	900990	Parts and accessories for photo-copying apparatus	2%
90	902214	X-rays apparatus, medica	2%
90	902690	Parts of equipment to measure or check fluid variables	2%
90	903120	Test benches for measuring or checking equipment	1%
90	902620	Equipment to measure or check pressure	1%
91	910610	Time-registers, time-recorders	27%
91	910690	Time of day recording apparatus, nes	23%
92	920991	Parts and accessories for pianos	69%
92	920910	Metronomes, tuning forks and pitch pipes	8%
93	930400	Arms nes, (spring/air/gas guns, truncheons, etc)	60%
93	930621	Cartridges, shotgun	32%
94	940190	Parts of seats	89%
95	950800	Play, fair-ground equipment, travellng circus, theatre	59%
96	960720	Parts of slide fasteners	26%
96	960891	Pen nibs, nib points nes	19%
96	960899	Duplicating stylos, pen/pencil holders, pen parts	14%
97	970500	Collections and collectors pieces	91%

Data source: United Nations Trade Statistics (2018)

Appendix IV: Export-Import Tariffs Database

A. Database of export tariffs from 1997-2017 (in %)

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71	31.71
5	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	3.20	2.99	2.77	2.56	2.35	2.13	1.92	1.71	1.49	1.28
8	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	1.50	1.20	0.90	0.60	0.30	0.00	0.00	0.00	0.00	0.00
9	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
12	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
13	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60	9.60
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90	20.90
20	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	22.04	21.43	20.82	20.20	19.59	18.98	18.37	17.76	17.76	17.76
21	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	19.97	19.80	19.64	19.47	19.31	19.14	18.98	18.81	18.81	18.81
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	10.45	10.45	10.45	10.45	10.45	10.45	10.45	10.45	10.45	10.45	10.45	5.82	5.31	4.78	4.27	3.76	3.25	3.08	2.93	2.93	2.93
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	5.22	5.22	5.22	5.22	5.22	5.22	5.22	5.22	5.22	5.22	5.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	5.93	5.93	5.93	5.93	5.93	5.93	5.93	5.93	5.93	5.93	5.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42	9.42
36	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	5.58	5.58	5.58	5.58	5.58	5.58	5.58	5.58	5.58	5.58	5.58	0.45	0.38	0.32	0.26	0.19	0.13	0.07	0.00	0.00	0.00
42	25.03	25.03	25.03	25.03	25.03	25.03	25.03	25.03	25.03	25.03	25.03	13.23	11.35	9.46	7.58	5.70	3.82	1.93	0.05	0.00	0.00
43	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
44	10.54	10.54	10.54	10.54	10.54	10.54	10.54	10.54	10.54	10.54	10.54	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.29	9.29	9.29
45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.99	3.54	2.83	2.12	1.41	0.71	0.00	0.00	0.00	0.00	0.00
47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	7.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	6.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
55	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	13.40	13.40	13.40	13.40	13.40	13.40	13.40	13.40	13.40	13.40	13.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	9.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	12.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	5.71	5.71	5.71	5.71	5.71	5.71	5.71	5.71	5.71	5.71	5.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	20.91	20.91	20.91	20.91	20.91	20.91	20.91	20.91	20.91	20.91	20.91	20.19	19.78	19.37	18.96	18.55	18.14	17.73	17.32	17.31	17.31
65	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	0.29	0.26	0.24	0.21	0.18	0.15	0.12	0.09	0.06	0.03
68	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	1.15	0.98	0.82	0.66	0.49	0.33	0.17	0.00	0.00	0.00
73	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	25.09	25.09	25.09	25.09	25.09	25.09	25.09	25.09	25.09	25.09	25.09	10.04	8.61	7.18	5.75	4.32	2.89	1.46	0.03	0.00	0.00
92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93	11.77	11.77	11.77	11.77	11.77	11.77	11.77	11.77	11.77	11.77	11.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	4.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Data source: Government of Indonesia and Government of Japan (2007); Japan Customs (2018)

B. Database of import tariffs from 1997-2017

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.40	1.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00
2	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
3	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	8.09	7.28	6.47	5.66	4.85	4.05	3.24	2.43	1.62	0.81
4	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.69	6.24	5.79	5.34	5.28	5.28	5.28	5.28	5.28	5.28
5	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	7.59	7.59	7.59	7.59	7.59	7.59	7.59	7.59	7.59	7.59	7.59	10.00	6.67	3.34	0.01	0.00	0.00	0.00	0.00	0.00	0.00
7	15.15	15.15	15.15	15.15	15.15	15.15	15.15	15.15	15.15	15.15	15.15	18.53	16.52	14.50	12.49	10.47	8.46	6.77	5.07	3.38	1.69
8	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	2.20	1.49	0.79	0.09	0.00	0.00	0.00	0.00	0.00	0.00
9	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	3.52	2.02	0.52	0.18	0.00	0.00	0.00	0.00	0.00
11	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	4.85	3.97	3.09	2.78	2.56	2.34	2.12	1.90	1.68
12	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.07	0.57	0.06	0.00	0.00	0.00	0.00	0.00	0.00
13	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.40	1.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00
14	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	1.60	1.09	0.57	0.06	0.00	0.00	0.00	0.00	0.00	0.00
15	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.40	1.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00
16	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	5.00	4.29	3.58	2.87	2.16	1.45	0.74	0.03	0.00	0.00
17	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.29	3.58	2.87	2.16	1.45	0.74	0.03	0.00	0.00
18	12.71	12.71	12.71	12.71	12.71	12.71	12.71	12.71	12.71	12.71	12.71	8.15	6.98	5.82	4.66	3.50	2.34	1.17	0.01	0.00	0.00
19	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	2.27	1.95	1.62	1.30	0.98	0.65	0.33	0.01	0.00	0.00
20	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50	8.53	7.56	6.59	5.62	4.65	3.68	2.71	1.80	0.90
21	5.92	5.92	5.92	5.92	5.92	5.92	5.92	5.92	5.92	5.92	5.92	5.92	5.35	4.77	4.20	3.62	3.05	2.48	1.90	1.72	1.55
22	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50
23	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.10	1.87	1.63	1.40	1.17	0.93	0.70	0.47	0.23
24	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	3.00	2.00	1.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.07	0.65	0.52	0.39	0.26	0.13	0.01	0.00	0.00
28	5.89	5.89	5.89	5.89	5.89	5.89	5.89	5.89	5.89	5.89	5.89	3.30	1.88	0.46	0.16	0.08	0.00	0.00	0.00	0.00	0.00

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
29	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.50	0.32	0.15	0.08	0.00	0.00	0.00	0.00	0.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.40	1.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	4.80	3.52	2.23	1.11	0.52	0.00	0.00	0.00	0.00	0.00
33	68.95	68.95	68.95	68.95	68.95	68.95	68.95	68.95	68.95	68.95	68.95	71.75	69.87	67.99	66.10	64.22	62.34	62.34	62.34	62.34	62.34
34	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	3.69	6.49	5.19	3.89	2.60	1.30	0.00	0.00	0.00	0.00	0.00
35	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.10	2.93	1.76	0.60	0.24	0.00	0.00	0.00	0.00	0.00
36	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	10.00	8.00	6.00	4.00	2.00	0.00	0.00	0.00	0.00	0.00
37	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.18	1.48	0.78	0.09	0.00	0.00	0.00	0.00	0.00	0.00
38	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.88	2.75	1.63	0.81	0.00	0.00	0.00	0.00	0.00
39	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.51	5.24	3.98	2.71	2.17	1.65	1.28	0.90	0.60	0.30
40	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	7.70	5.60	3.50	2.51	1.58	0.79	0.01	0.00	0.00
41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	8.57	7.14	5.71	4.28	2.85	1.42	-0.01	0.00	0.00
43	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.29	3.58	2.87	2.16	1.45	0.74	0.03	0.00	0.00
44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50
45	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.40	1.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00
46	25.01	25.01	25.01	25.01	25.01	25.01	25.01	25.01	25.01	25.01	25.01	10.00	6.88	3.77	0.65	0.32	0.00	0.00	0.00	0.00	0.00
47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.68	2.37	1.05	0.47	0.00	0.00	0.00	0.00	0.00
49	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	6.30	5.04	3.78	2.52	1.26	0.00	0.00	0.00	0.00	0.00
50	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	3.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	22.50	22.50	22.50	22.50	22.50	22.50	22.50	22.50	22.50	22.50	22.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
58	8.63	8.63	8.63	8.63	8.63	8.63	8.63	8.63	8.63	8.63	8.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	35.00	30.00	25.00	20.00	15.00	10.00	5.00	0.00	0.00	0.00
65	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00
66	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00
67	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	15.00	13.50	12.00	10.50	9.00	7.50	6.00	4.50	3.00	1.50
68	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	7.04	5.00	4.17	3.34	2.50	1.86	1.25	0.64	0.03	0.00	0.00
69	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.16	3.57	2.98	2.39	1.80	1.20	0.61	0.02	0.00	0.00
70	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.69	5.00	4.16	3.31	2.47	1.86	1.25	0.63	0.02	0.00	0.00
71	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20	13.70	13.54	13.37	13.21	13.04	12.88	12.71	12.55	12.38	12.22
73	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.25	12.15	12.06	11.96	11.86	11.76	11.66	11.56	11.46	11.36
74	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.65	4.30	3.95	3.82	3.71	3.71	3.71	3.71	3.71
75	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	6.18	4.76	3.34	1.92	0.50	0.26	0.01	0.00	0.00
76	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	1.40	0.74	0.08	0.00	0.00	0.00	0.00	0.00	0.00
78	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.40	1.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00
79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.87	2.73	1.60	1.20	0.91	0.62	0.34	0.22	0.11
81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.70	0.51	0.32	0.23	0.15	0.08	0.00	0.00	0.00
83	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.46	11.30	6.79	2.27	0.64	0.00	0.00	0.00	0.00	0.00	0.00
84	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	3.01	2.02	1.71	1.39	1.08	0.76	0.61	0.46	0.31	0.15
85	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	2.87	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	12.82	7.82	3.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	2.56	0.14	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.29	3.58	2.87	2.16	1.45	0.74	0.03	0.00	0.00
92	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.29	3.58	2.87	2.16	1.45	0.74	0.03	0.00	0.00
93	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50
94	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	5.47	4.76	4.05	3.34	2.63	1.92	1.21	0.80	0.40
97	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.40	1.80	0.20	0.00	0.00	0.00	0.00	0.00	0.00

Data source: Government of Indonesia and Government of Japan (2007); Kementerian Keuangan (2017)

Appendix V: STATA Estimation Outputs

A. Descriptive Statistics

```
. xtset id t
       panel variable:  id (strongly balanced)
        time variable:  t, 1997 to 2017
                delta:  1 unit
```

```
. xtsum ln_ve1 ln_vi1 ln_gdpij xr tr_e tr_i
```

Variable		Mean	Std. Dev.	Min	Max	Observations
ln_ve1	overall	15.6002	3.632379	0	23.67536	N = 2016
	between		3.163029	5.790291	22.87969	n = 96
	within		1.813485	-2.478688	26.94604	T = 21
ln_vi1	overall	14.19133	4.575946	0	22.64824	N = 2016
	between		3.009224	5.359895	19.7165	n = 96
	within		3.460308	-5.525166	23.47519	T = 21
ln_gdpij	overall	29.30018	.1486982	29.04819	29.59365	N = 2016
	between		0	29.30018	29.30018	n = 96
	within		.1486982	29.04819	29.59365	T = 21
xr	overall	91.55048	22.88115	22.01	122.69	N = 2016
	between		0	91.55048	91.55048	n = 96
	within		22.88115	22.01	122.69	T = 21
tr_e	overall	.0404862	.0707171	0	.3171323	N = 2016
	between		.0646458	0	.3171323	n = 96
	within		.0293823	-.1158984	.1408183	T = 21
tr_i	overall	.0527146	.0844913	-.0001	.7175425	N = 2016
	between		.0750553	0	.6714696	n = 96
	within		.0395145	-.1710949	.1789051	T = 21

B. Hausman Test

- Export Values

```
. quietly xtreg ln_ve1 ln_gdpij q_e fta1 xr tr_e , fe

. estimate store fe

. quietly xtreg ln_ve1 ln_gdpij q_e fta1 xr tr_e , re

. estimate store re

. hausman fe re
```

	——— Coefficients ———			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ln_gdpij	2.252528	2.251663	.0008644	.
q_e	.5708129	.6061567	-.0353438	.0485698
fta1	-.4653761	-.4904544	.0250783	.0166649
xr	.0090398	.0089365	.0001033	.0001096
tr_e	2.753775	1.96097	.7928055	.5269064

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 2.43
Prob>chi2 = 0.6568
(V_b-V_B is not positive definite)

- Import Values

```
. quietly xtreg ln_vi1 ln_gdpij q_i fta1 xr tr_i , fe

. estimate store fe

. quietly xtreg ln_vi1 ln_gdpij q_i fta1 xr tr_i , re

. estimate store re

. hausman fe re
```

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ln_gdpij	-2.157294	-2.104272	-.0530223	.
q_i	-.7239319	-1.126506	.4025738	.1283761
fta1	2.491624	2.488242	.0033817	.0503619
xr	-.0007721	.0003231	-.0010952	.0003118
tr_i	-3.732081	-3.834858	.1027766	1.303185

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

  Test:  Ho:  difference in coefficients not systematic

              chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        9.91
            Prob>chi2 =      0.0777
            (V_b-V_B is not positive definite)
```

C. Export Levels Fixed Effects Regressions

```
. xtreg ln_ve1 ln_gdpij , fe robust

Fixed-effects (within) regression               Number of obs      =      2,016
Group variable: id                              Number of groups   =         96

R-sq:                                           Obs per group:
     within  = 0.0227                                         min =         21
     between = 0.0000                                         avg =       21.0
     overall = 0.0057                                         max =         21

                                                F(1,95)            =      12.19
corr(u_i, Xb)  = -0.0000                        Prob > F           =     0.0007

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_ve1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |      1.8381   .5264995     3.49   0.001     .7928663    2.883334
       _cons |    -38.25647   15.42653    -2.48   0.015    -68.88201   -7.630932
-------------+----------------------------------------------------------------
     sigma_u |   3.1630287
     sigma_e |   1.8370653
         rho |   .74776382   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg ln_ve1 ln_gdpij xr , fe robust

Fixed-effects (within) regression               Number of obs      =      2,016
Group variable: id                              Number of groups   =         96

R-sq:                                           Obs per group:
     within  = 0.0249                                         min =         21
     between =      .                                         avg =       21.0
     overall = 0.0062                                         max =         21

                                                F(2,95)            =       6.43
corr(u_i, Xb)  = -0.0000                        Prob > F           =     0.0024

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_ve1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |    1.270019   .4256488     2.98   0.004     .4249988    2.115038
          xr |    .0052233   .0035828     1.46   0.148    -.0018893     .012336
       _cons |   -22.08978   12.42075    -1.78   0.079    -46.74809    2.56853
-------------+----------------------------------------------------------------
     sigma_u |   3.1630287
     sigma_e |   1.8354995
         rho |   .74808535   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg ln_ve1 ln_gdpij xr tr_e , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0283                                         min =          21
     between = 0.0130                                         avg =        21.0
     overall = 0.0000                                         max =          21

                                                F(3,95)            =        4.85
corr(u_i, Xb)  = -0.1287                        Prob > F           =      0.0035

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_ve1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |   1.505211   .4854889     3.10   0.003     .5413933    2.469028
          xr |   .0065353   .0035047     1.86   0.065    -.0004223    .0134929
        tr_e |   4.132691   3.151405     1.31   0.193    -2.123638    10.38902
       _cons |  -29.26838   14.26281    -2.05   0.043    -57.58364   -.9531146
-------------+----------------------------------------------------------------
     sigma_u |  3.2044869
     sigma_e |  1.8327875
         rho |   .7535113   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg ln_ve1 ln_gdpij xr tr_e q_e , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0317                                         min =          21
     between = 0.0003                                         avg =        21.0
     overall = 0.0030                                         max =          21

                                                F(4,95)            =        4.25
corr(u_i, Xb)  = -0.0751                        Prob > F           =      0.0033

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_ve1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |   1.463689   .4812908     3.04   0.003     .5082061    2.419172
          xr |   .0052008   .0036566     1.42   0.158    -.0020584    .0124601
        tr_e |   3.944234   3.057392     1.29   0.200    -2.125456    10.01392
         q_e |   .5734896   .3269051     1.75   0.083    -.0754991    1.222478
       _cons |  -28.02696     14.137    -1.98   0.050    -56.09245    .0385365
-------------+----------------------------------------------------------------
     sigma_u |  3.1822765
     sigma_e |  1.8299887
         rho |  .75148985   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg ln_ve1 tr_e fta1 , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0133                                         min =          21
     between = 0.0130                                         avg =        21.0
     overall = 0.0005                                         max =          21

                                                F(2,95)            =        3.38
corr(u_i, Xb)  = -0.1147                        Prob > F           =      0.0384

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_ve1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_e |   2.908667   3.182692     0.91   0.363    -3.409775    9.227109
        fta1 |   .4878176   .1890478     2.58   0.011     .1125103    .8631249
       _cons |   15.25014   .1880307    81.10   0.000     14.87685    15.62343
-------------+----------------------------------------------------------------
     sigma_u |  3.1899326
     sigma_e |  1.8464109
         rho |  .74904251   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

D. Export Growth Fixed Effects Regressions

```
. xtreg changeln_ve changeln_gdpij , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0102                                         min =          20
     between =      .                                         avg =        20.0
     overall = 0.0101                                         max =          20

                                                F(1,95)            =       21.54
corr(u_i, Xb)  = 0.0000                         Prob > F           =      0.0000

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_ve|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|   2.326948   .5014027     4.64   0.000     1.331538    3.322358
       _cons |   .0415313    .006056     6.86   0.000     .0295086    .0535541
-------------+----------------------------------------------------------------
     sigma_u |  .18419355
     sigma_e |  2.0238466
         rho |  .00821507   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg changeln_ve changeln_gdpij growthxr , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0110                                         min =          20
     between =      .                                         avg =        20.0
     overall = 0.0109                                         max =          20

                                                F(2,95)            =       13.35
corr(u_i, Xb)  = -0.0000                        Prob > F           =      0.0000

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_ve|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|   2.12317    .411385     5.16   0.000     1.306468    2.939873
    growthxr |  -.0910566   .0917863    -0.99   0.324    -.2732755    .0911622
       _cons |   .0592871   .0150339     3.94   0.000      .029441    .0891331
-------------+----------------------------------------------------------------
     sigma_u |  .18419355
     sigma_e |  2.0235947
         rho |   .0082171   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg changeln_ve changeln_gdpij growthxr growthtr_e , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0124                                         min =          20
     between = 0.0003                                         avg =        20.0
     overall = 0.0122                                         max =          20

                                                F(3,95)            =        8.91
corr(u_i, Xb)  = -0.0097                        Prob > F           =      0.0000

                                         (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_ve|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|    2.26927   .4445032     5.11   0.000     1.386819    3.15172
     growthxr|   -.0858561     .09112    -0.94   0.348    -.2667521     .09504
growthtr_enew|    .4914889   .2811363     1.75   0.084    -.0666371    1.049615
       _cons|    .0732104   .0180306     4.06   0.000     .0374151    .1090057
-------------+----------------------------------------------------------------
     sigma_u|   .18509494
     sigma_e|    2.022661
         rho|   .00830465   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg changeln_ve changeln_gdpij growthxr growthtr_e q_e , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0126                                         min =          20
     between = 0.0006                                         avg =        20.0
     overall = 0.0116                                         max =          20

                                                F(4,95)            =        6.75
corr(u_i, Xb)  = -0.0833                        Prob > F           =      0.0001

                                         (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_ve|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|   2.221494   .4337264     5.12   0.000     1.360438    3.08255
     growthxr|   -.0980485   .0977795    -1.00   0.319    -.2921653    .0960682
growthtr_enew|    .4821341   .2808688     1.72   0.089    -.0754609    1.039729
         q_e|   -.1583139    .226806    -0.70   0.487    -.6085806    .2919529
       _cons|    .1059461   .0534912     1.98   0.051    -.0002473    .2121395
-------------+----------------------------------------------------------------
     sigma_u|   .19483758
     sigma_e|   2.0230212
         rho|   .00919041   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg changeln_ve growthtr_e fta1 , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0014                                         min =          20
     between = 0.0003                                         avg =        20.0
     overall = 0.0014                                         max =          20

                                                F(2,95)            =        3.96
corr(u_i, Xb)  = -0.0043                        Prob > F           =      0.0222

                                              (Std. Err. adjusted for 96 clusters in id)
```

changeln_ve	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
growthtr_enew	.2161454	.2663151	0.81	0.419	-.3125569	.7448478
fta1	-.1212862	.0480991	-2.52	0.013	-.216775	-.0257974
_cons	.1375631	.024221	5.68	0.000	.0894784	.1856478
sigma_u	.18427803					
sigma_e	2.0333132					
rho	.00814678	(fraction of variance due to u_i)				

E. Import Levels Fixed Effects Regressions

```
. xtreg ln_vi1 ln_gdpij , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0460                                         min =          21
     between =      .                                         avg =        21.0
     overall = 0.0263                                         max =          21

                                                F(1,95)            =       67.55
corr(u_i, Xb)  = 0.0000                         Prob > F           =      0.0000

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_vi1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |    4.989926   .6071366     8.22   0.000     3.784607    6.195244
       _cons |   -132.0144   17.78921    -7.42   0.000    -167.3305   -96.69836
-------------+----------------------------------------------------------------
     sigma_u |  3.0092238
     sigma_e |   3.463327
         rho |   .43018534   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg ln_vi1 ln_gdpij xr , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0565                                         min =          21
     between =      .                                         avg =        21.0
     overall = 0.0323                                         max =          21

                                                F(2,95)            =       34.11
corr(u_i, Xb)  = -0.0000                        Prob > F           =      0.0000

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_vi1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |    2.603282   .4471168     5.82   0.000     1.715643    3.490921
          xr |    .0219445   .0035471     6.19   0.000     .0149026    .0289864
       _cons |   -64.09433   13.12349    -4.88   0.000    -90.14776   -38.0409
-------------+----------------------------------------------------------------
     sigma_u |  3.0092238
     sigma_e |  3.4450447
         rho |   .43278204   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg ln_vi1 ln_gdpij xr tr_i , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0634                                         min =          21
     between = 0.0085                                         avg =        21.0
     overall = 0.0355                                         max =          21

                                                F(3,95)            =       22.80
corr(u_i, Xb)  = -0.0769                        Prob > F           =      0.0000

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_vi1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |    1.957576   .4873052     4.02   0.000     .9901525    2.924999
          xr |    .0167517   .0036823     4.55   0.000     .0094413    .0240621
        tr_i |   -8.832329   3.228368    -2.74   0.007    -15.24145   -2.423207
       _cons |   -44.23403   14.39803    -3.07   0.003    -72.81774   -15.65032
-------------+----------------------------------------------------------------
     sigma_u |  3.0209374
     sigma_e |  3.4333618
         rho |  .43636067   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg ln_vi1 ln_gdpij xr tr_i q_i , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0655                                         min =          21
     between = 0.0531                                         avg =        21.0
     overall = 0.0602                                         max =          21

                                                F(4,95)            =       20.96
corr(u_i, Xb)  = 0.0008                         Prob > F           =      0.0000

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_vi1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |    2.054864   .4876078     4.21   0.000      1.08684    3.022887
          xr |    .0187597   .0037936     4.95   0.000     .0112285    .0262909
        tr_i |   -8.824483   3.134734    -2.82   0.006    -15.04772   -2.60125
         q_i |   -.7168633   .3913288    -1.83   0.070    -1.493749    .0600225
       _cons |   -47.10739   14.39759    -3.27   0.001    -75.69022   -18.52456
-------------+----------------------------------------------------------------
     sigma_u |  2.9282293
     sigma_e |  3.4303743
         rho |  .42151848   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg ln_vi1  tr_i  fta1 , fe robust

Fixed-effects (within) regression               Number of obs      =       2,016
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0849                                         min =          21
     between = 0.0085                                         avg =        21.0
     overall = 0.0522                                         max =          21

                                                F(2,95)            =       37.50
corr(u_i, Xb)  = 0.0005                         Prob > F           =      0.0000

                                    (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
      ln_vi1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_i |  -3.633461   3.297869    -1.10   0.273    -10.18056    2.913636
        fta1 |   1.829138   .2675745     6.84   0.000     1.297936    2.360341
       _cons |   13.51185   .2626518    51.44   0.000     12.99042    14.03328
-------------+----------------------------------------------------------------
     sigma_u |  2.9963434
     sigma_e |  3.3928362
         rho |  .43818114   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

F. Import Growth Fixed Effects Regressions

```
. xtreg changeln_vi changeln_gdpij , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0350                                         min =          20
     between =      .                                         avg =        20.0
     overall = 0.0350                                         max =          20

                                                F(1,95)            =       25.99
corr(u_i, Xb)  = -0.0000                        Prob > F           =      0.0000

                                          (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_vi|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|  -7.765126   1.523135    -5.10   0.000    -10.78893   -4.741322
       _cons |   .1352117   .0183967     7.35   0.000     .0986896    .1717338
-------------+----------------------------------------------------------------
     sigma_u |  .10220563
     sigma_e |  3.5956982
         rho |   .0008073   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg changeln_vi changeln_gdpij growthxr , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0404                                         min =          20
     between =      .                                         avg =        20.0
     overall = 0.0403                                         max =          20

                                                F(2,95)            =       20.74
corr(u_i, Xb)  = 0.0000                         Prob > F           =      0.0000

                                          (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_vi|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|  -8.718115   1.565854    -5.57   0.000    -11.82673   -5.609502
     growthxr |  -.4258362   .0923206    -4.61   0.000    -.6091157   -.2425567
       _cons |   .2182483   .0274841     7.94   0.000     .1636856    .2728111
-------------+----------------------------------------------------------------
     sigma_u |  .10220563
     sigma_e |   3.586737
         rho |  .00081133   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg changeln_vi changeln_gdpij growthxr growthtr_i , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0404                                         min =          20
     between = 0.0008                                         avg =        20.0
     overall = 0.0404                                         max =          20

                                                F(2,95)            =           .
corr(u_i, Xb)  = -0.0007                        Prob > F           =           .

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_vi|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|  -8.726914   1.566271    -5.57   0.000    -11.83635   -5.617474
     growthxr|     -.4261   .0923241    -4.62   0.000    -.6093866   -.2428135
growthtr_inew|  2.90e-08   4.19e-09     6.93   0.000     2.07e-08    3.73e-08
       _cons|   .2178008    .027414     7.94   0.000     .1633771    .2722245
-------------+----------------------------------------------------------------
     sigma_u |  .10253802
     sigma_e |  3.5876259
         rho |  .00081621   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg changeln_vi changeln_gdpij growthxr growthtr_i q_i , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0406                                         min =          20
     between = 0.0051                                         avg =        20.0
     overall = 0.0399                                         max =          20

                                                F(3,95)            =           .
corr(u_i, Xb)  = -0.0776                        Prob > F           =           .

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
  changeln_vi|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
changeln_gdpij|  -8.698779    1.56073    -5.57   0.000    -11.79722   -5.600339
     growthxr|  -.4063138   .0925654    -4.39   0.000    -.5900793   -.2225483
growthtr_inew|  2.90e-08   4.18e-09     6.94   0.000     2.07e-08    3.73e-08
         q_i |   .2323528   .2694671     0.86   0.391     -.302607    .7673126
       _cons|   .1591967   .0674567     2.36   0.020     .0252783    .2931151
-------------+----------------------------------------------------------------
     sigma_u |  .13710416
     sigma_e |  3.5882405
         rho |  .00145782   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg changeln_vi growthtr_i fta1 , fe robust

Fixed-effects (within) regression               Number of obs      =       1,920
Group variable: id                              Number of groups   =          96

R-sq:                                           Obs per group:
     within  = 0.0005                                         min =          20
     between = 0.0008                                         avg =        20.0
     overall = 0.0005                                         max =          20

                                                F(1,95)            =           .
corr(u_i, Xb)  = -0.0004                        Prob > F           =           .

                                    (Std. Err. adjusted for 96 clusters in id)
```

changeln_vi	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
growthtr_inew	4.00e-09	5.58e-10	7.17	0.000	2.90e-09	5.11e-09
fta1	.1636964	.0419819	3.90	0.000	.0803518	.2470411
_cons	-.0405077	.0209795	-1.93	0.056	-.0821572	.0011417
sigma_u	.10223159					
sigma_e	3.660402					
rho	.00077942	(fraction of variance due to u_i)				

G. Trade Balance Fixed Effects Regressions

```
. xtreg TB ln_gdpij , re robust

Random-effects GLS regression                   Number of obs     =      2,016
Group variable: id                              Number of groups  =         96

R-sq:                                           Obs per group:
     within  = 0.0000                                         min =         21
     between = 0.0000                                         avg =       21.0
     overall = 0.0001                                         max =         21

                                                Wald chi2(1)      =       0.05
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.8210

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
          TB |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |   5.44e+07   2.41e+08     0.23   0.821    -4.17e+08    5.26e+08
       _cons |  -1.50e+09   6.95e+09    -0.22   0.829    -1.51e+10    1.21e+10
-------------+----------------------------------------------------------------
     sigma_u |  1.017e+09
     sigma_e |  4.966e+08
         rho |  .80756225   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg TB ln_gdpij xr , re robust

Random-effects GLS regression                   Number of obs     =      2,016
Group variable: id                              Number of groups  =         96

R-sq:                                           Obs per group:
     within  = 0.0007                                         min =         21
     between = 0.0000                                         avg =       21.0
     overall = 0.0001                                         max =         21

                                                Wald chi2(2)      =       1.78
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.4098

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
          TB |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdpij |   1.20e+08   3.00e+08     0.40   0.688    -4.67e+08    7.08e+08
          xr |  -607422.4   638045.6    -0.95   0.341     -1857969    643123.9
       _cons |  -3.38e+09   8.63e+09    -0.39   0.695    -2.03e+10    1.35e+10
-------------+----------------------------------------------------------------
     sigma_u |  1.017e+09
     sigma_e |  4.966e+08
         rho |  .80754503   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg TB ln_gdpij xr tr_e tr_i , re robust

Random-effects GLS regression                   Number of obs     =      2,016
Group variable: id                              Number of groups  =         96

R-sq:                                           Obs per group:
     within  = 0.0007                                         min =         21
     between = 0.0032                                         avg =       21.0
     overall = 0.0000                                         max =         21

                                                Wald chi2(4)      =       3.83
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.4299

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
          TB |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   ln_gdpij |    1.22e+08   3.45e+08     0.35   0.724    -5.55e+08    7.99e+08
         xr |   -595361.6   395830.4    -1.50   0.133     -1371175    180451.8
       tr_e |   -1.01e+07   5.17e+08    -0.02   0.984    -1.02e+09    1.00e+09
       tr_i |    2.60e+07   3.74e+08     0.07   0.945    -7.07e+08    7.59e+08
      _cons |   -3.42e+09   1.00e+10    -0.34   0.733    -2.31e+10    1.62e+10
-------------+----------------------------------------------------------------
    sigma_u |  1.025e+09
    sigma_e |  4.969e+08
        rho |  .80977574   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtreg TB ln_gdpij xr tr_e tr_i q_e q_i , re robust

Random-effects GLS regression                   Number of obs     =      2,016
Group variable: id                              Number of groups  =         96

R-sq:                                           Obs per group:
     within  = 0.0115                                         min =         21
     between = 0.0527                                         avg =       21.0
     overall = 0.0416                                         max =         21

                                                Wald chi2(6)      =      10.35
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.1106

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
          TB |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   ln_gdpij |    1.00e+08   3.35e+08     0.30   0.764    -5.56e+08    7.57e+08
         xr |   -1197259    725377.7    -1.65   0.099     -2618973    224455.5
       tr_e |   -6.14e+07   4.85e+08    -0.13   0.899    -1.01e+09    8.90e+08
       tr_i |   -1.02e+08   2.96e+08    -0.35   0.730    -6.83e+08    4.78e+08
        q_e |    2.91e+08   2.10e+08     1.39   0.166    -1.21e+08    7.02e+08
        q_i |   -4.86e+07   6.81e+07    -0.71   0.476    -1.82e+08    8.49e+07
      _cons |   -2.77e+09   9.71e+09    -0.29   0.775    -2.18e+10    1.62e+10
-------------+----------------------------------------------------------------
    sigma_u |  1.011e+09
    sigma_e |  4.945e+08
        rho |  .80697234   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg TB tr_e tr_i fta1 , re robust

Random-effects GLS regression                   Number of obs     =      2,016
Group variable: id                              Number of groups  =         96

R-sq:                                           Obs per group:
     within  = 0.0002                                         min =         21
     between = 0.0052                                         avg =       21.0
     overall = 0.0037                                         max =         21

                                                Wald chi2(3)      =       0.42
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.9370

                                              (Std. Err. adjusted for 96 clusters in id)
------------------------------------------------------------------------------
             |               Robust
          TB |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        tr_e |  -1.93e+08   5.66e+08    -0.34   0.733    -1.30e+09    9.17e+08
        tr_i |  -1.37e+08   3.85e+08    -0.36   0.722    -8.92e+08    6.18e+08
        fta1 |  -2.37e+07   8.66e+07    -0.27   0.785    -1.93e+08    1.46e+08
       _cons |   1.21e+08   4.26e+07     2.85   0.004     3.79e+07    2.05e+08
-------------+----------------------------------------------------------------
     sigma_u |  1.025e+09
     sigma_e |  4.969e+08
         rho |  .80978412   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

H. Export Sectoral Fixed Effects Regressions

```
. xtreg ln_ve1 tr_e fta1 i.id, re robust

Random-effects GLS regression                   Number of obs     =      2,016
Group variable: id                              Number of groups  =         96

R-sq:                                           Obs per group:
     within  = 0.0133                                         min =         21
     between = 1.0000                                         avg =       21.0
     overall = 0.7540                                         max =         21

                                                Wald chi2(2)      =          .
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =          .

                                              (Std. Err. adjusted for 96 clusters in id)
```

ln_ve1	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
tr_e	2.908667	3.26056	0.89	0.372	-3.481913	9.299246
fta1	.4878176	.193673	2.52	0.012	.1082254	.8674098
id						
2	.1168926	.2049495	0.57	0.568	-.2848009	.5185862
3	7.513214	.0683165	109.98	0.000	7.379316	7.647112
4	-1.186073	1.034029	-1.15	0.251	-3.212732	.8405862
5	.7409008	.3415824	2.17	0.030	.0714116	1.41039
6	2.122021	1.55e-14	1.4e+14	0.000	2.122021	2.122021
7	3.245626	.1656832	19.59	0.000	2.920893	3.570359
8	.5754952	.0904743	6.36	0.000	.3981688	.7528216
9	5.809106	.0038692	1501.39	0.000	5.801522	5.816689
10	1.394024	1.55e-14	9.0e+13	0.000	1.394024	1.394024
11	1.457982	.8151399	1.79	0.074	-.1396626	3.055627
12	2.0991	.489084	4.29	0.000	1.140513	3.057687
13	2.031301	.3415824	5.95	0.000	1.361812	2.70079
14	1.881583	1.55e-14	1.2e+14	0.000	1.881583	1.881583
15	4.079491	.0502623	81.16	0.000	3.980979	4.178004
16	4.994992	.3130137	15.96	0.000	4.381497	5.608488
17	2.320893	1.54e-14	1.5e+14	0.000	2.320893	2.320893
18	3.356915	1.55e-14	2.2e+14	0.000	3.356915	3.356915
19	2.238534	.681457	3.28	0.001	.9029032	3.574166
20	3.002775	.7275409	4.13	0.000	1.576821	4.428729
21	1.832175	.6655393	2.75	0.006	.5277422	3.136608
22	3.406691	1.55e-14	2.2e+14	0.000	3.406691	3.406691
23	3.59977	1.54e-14	2.3e+14	0.000	3.59977	3.59977
24	1.549304	.2771476	5.59	0.000	1.006105	2.092504
25	2.292674	1.54e-14	1.5e+14	0.000	2.292674	2.292674
26	8.002304	1.55e-14	5.2e+14	0.000	8.002304	8.002304
27	10.22725	1.54e-14	6.6e+14	0.000	10.22725	10.22725
28	4.532289	.0522102	86.81	0.000	4.429959	4.634619
29	5.880827	.2390574	24.60	0.000	5.412283	6.349371
30	3.946051	1.54e-14	2.6e+14	0.000	3.946051	3.946051

31	2.962164	1.56e-14	1.9e+14	0.000	2.962164	2.962164
32	3.538629	.0890805	39.72	0.000	3.364035	3.713224
33	3.275495	.1012284	32.36	0.000	3.077091	3.473899
34	3.594385	.1021625	35.18	0.000	3.39415	3.794619
35	1.926741	.3071173	6.27	0.000	1.324802	2.52868
36	-1.805704	.0666086	-27.11	0.000	-1.936255	-1.675154
37	-3.264595	1.55e-14	-2.1e+14	0.000	-3.264595	-3.264595
38	4.944203	.0056076	881.69	0.000	4.933213	4.955194
39	6.69633	.0449595	148.94	0.000	6.608211	6.784449
40	7.397695	1.55e-14	4.8e+14	0.000	7.397695	7.397695
41	1.590195	.0980964	16.21	0.000	1.397929	1.78246
42	3.556012	.5099015	6.97	0.000	2.556623	4.5554
43	-4.33726	.6521119	-6.65	0.000	-5.615376	-3.059144
44	7.697647	.3300984	23.32	0.000	7.050666	8.344628
45	-3.868867	1.55e-14	-2.5e+14	0.000	-3.868867	-3.868867
46	3.125605	.0845984	36.95	0.000	2.959795	3.291415
47	5.151209	1.55e-14	3.3e+14	0.000	5.151209	5.151209
48	6.802886	.0474859	143.26	0.000	6.709816	6.895957
49	.8273988	1.55e-14	5.3e+13	0.000	.8273988	.8273988
50	-3.722862	.1707912	-21.80	0.000	-4.057606	-3.388117
51	-3.159562	1.55e-14	-2.0e+14	0.000	-3.159562	-3.159562
52	5.75504	.1284586	44.80	0.000	5.503266	6.006815
53	-1.21355	1.55e-14	-7.8e+13	0.000	-1.21355	-1.21355
54	5.021933	.1139731	44.06	0.000	4.79855	5.245316
55	5.850434	.1363982	42.89	0.000	5.583098	6.11777
56	3.595285	.0630565	57.02	0.000	3.471697	3.718874
57	3.54558	.2288602	15.49	0.000	3.097022	3.994138
58	1.175458	.0861186	13.65	0.000	1.006668	1.344247
59	3.523798	.080409	43.82	0.000	3.366199	3.681397
60	1.992414	.0902299	22.08	0.000	1.815567	2.169262
61	5.371289	.1624624	33.06	0.000	5.052869	5.689709
62	5.91989	.2083088	28.42	0.000	5.511612	6.328168
63	4.874278	.0975847	49.95	0.000	4.683015	5.06554
64	5.310966	.6438002	8.25	0.000	4.049141	6.572792
65	2.56168	.0075833	337.81	0.000	2.546817	2.576543
66	-2.445865	.1091557	-22.41	0.000	-2.659806	-2.231923
67	.6289964	.0326551	19.26	0.000	.5649937	.6929992
68	3.015737	.0111001	271.69	0.000	2.993981	3.037493
69	4.010837	1.55e-14	2.6e+14	0.000	4.010837	4.010837
70	4.289841	.1020512	42.04	0.000	4.089825	4.489858
71	5.098207	1.57e-14	3.2e+14	0.000	5.098207	5.098207
72	4.363216	.0856152	50.96	0.000	4.195413	4.531018
73	5.749601	.0274779	209.24	0.000	5.695745	5.803456
74	6.089201	1.54e-14	3.9e+14	0.000	6.089201	6.089201
75	7.204397	1.54e-14	4.7e+14	0.000	7.204397	7.204397
76	6.349515	1.54e-14	4.1e+14	0.000	6.349515	6.349515
78	-3.31164	.0649007	-51.03	0.000	-3.438843	-3.184437
79	.7743836	.0520945	14.86	0.000	.6722803	.8764868
80	1.608772	.0512374	31.40	0.000	1.508349	1.709196

81	-.7077108	1.55e-14	-4.6e+13	0.000	-.7077108	-.7077108
82	2.658704	1.55e-14	1.7e+14	0.000	2.658704	2.658704
83	3.915048	.0700321	55.90	0.000	3.777787	4.052308
84	7.437758	1.56e-14	4.8e+14	0.000	7.437758	7.437758
85	8.002216	1.55e-14	5.2e+14	0.000	8.002216	8.002216
86	-.9465034	1.54e-14	-6.1e+13	0.000	-.9465034	-.9465034
87	6.386772	1.56e-14	4.1e+14	0.000	6.386772	6.386772
88	-.1127547	1.56e-14	-7.2e+12	0.000	-.1127547	-.1127547
89	-.5812984	1.54e-14	-3.8e+13	0.000	-.5812984	-.5812984
90	4.616324	1.55e-14	3.0e+14	0.000	4.616324	4.616324
91	-.3200513	.4910978	-0.65	0.515	-1.282585	.6424827
92	5.261406	1.55e-14	3.4e+14	0.000	5.261406	5.261406
93	-7.041443	.2009943	-35.03	0.000	-7.435385	-6.647501
94	5.42057	.0065959	821.81	0.000	5.407642	5.433497
95	3.279759	.0649007	50.54	0.000	3.152556	3.406962
96	2.723549	.0848018	32.12	0.000	2.557341	2.889758
97	-1.013436	1.54e-14	-6.6e+13	0.000	-1.013436	-1.013436
_cons	12.42014	.0922253	134.67	0.000	12.23938	12.6009
sigma_u	0					
sigma_e	1.8464109					
rho	0	(fraction of variance due to u_i)				

I. Import Sectoral Fixed Effects Regressions

```
. xtreg ln_vi1 tr_i fta1 i.id, re robust

Random-effects GLS regression                   Number of obs     =      2,016
Group variable: id                              Number of groups  =         96

R-sq:                                           Obs per group:
     within  = 0.0849                                         min =         21
     between = 1.0000                                         avg =       21.0
     overall = 0.4767                                         max =         21

                                                Wald chi2(2)      =          .
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =          .

                                              (Std. Err. adjusted for 96 clusters in id)
```

ln_vi1	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
tr_i	-3.633461	3.378555	-1.08	0.282	-10.25531	2.988385
fta1	1.829138	.274121	6.67	0.000	1.291871	2.366405
id						
2	-1.832895	.0643695	-28.47	0.000	-1.959057	-1.706733
3	8.532606	.0506945	168.31	0.000	8.433247	8.631965
4	4.529003	.1035006	43.76	0.000	4.326146	4.731861
5	3.473019	.0160723	216.09	0.000	3.441517	3.50452
6	3.364565	.0619636	54.30	0.000	3.243119	3.486012
7	5.45691	.3210744	17.00	0.000	4.827615	6.086204
10	4.675626	.0707727	66.07	0.000	4.536914	4.814338
11	8.075096	.0466666	173.04	0.000	7.983631	8.166561
12	6.669314	.0714757	93.31	0.000	6.529224	6.809404
13	7.057898	.0006596	1.1e+04	0.000	7.056605	7.059191
14	2.867973	.0107295	267.30	0.000	2.846943	2.889002
15	7.887455	.0006596	1.2e+04	0.000	7.886162	7.888748
16	5.257542	.1933137	27.20	0.000	4.878654	5.63643
17	6.801469	.0162975	417.33	0.000	6.769526	6.833411
18	4.939269	.1728555	28.57	0.000	4.600479	5.27806
19	6.860317	.2640444	25.98	0.000	6.3428	7.377835
20	6.215125	.1465643	42.41	0.000	5.927865	6.502386
21	8.246724	.0558148	147.75	0.000	8.137329	8.356119
22	5.247069	.0281707	186.26	0.000	5.191855	5.302282
23	7.335627	.0426312	172.07	0.000	7.252071	7.419183
24	3.125154	.0080603	387.72	0.000	3.109356	3.140952
25	8.541003	.1045582	81.69	0.000	8.336073	8.745933
26	6.462386	.1045582	61.81	0.000	6.257456	6.667317
27	10.28949	.0710646	144.79	0.000	10.1502	10.42877
28	10.62829	.0091965	1155.69	0.000	10.61027	10.64632
29	11.91837	.0899561	132.49	0.000	11.74206	12.09468
30	8.555498	.0006596	1.3e+04	0.000	8.554205	8.55679
31	8.517121	.1045582	81.46	0.000	8.312191	8.722052
32	11.07273	.0402138	275.35	0.000	10.99391	11.15154
33	11.80448	2.164039	5.45	0.000	7.563039	16.04591
34	10.12097	.0079951	1265.90	0.000	10.1053	10.13664
35	9.280129	.0078607	1180.58	0.000	9.264722	9.295535

35	9.280129	.0078607	1180.58	0.000	9.264722	9.295535
36	3.303247	.0321928	102.61	0.000	3.24015	3.366344
37	9.535033	.0473528	201.36	0.000	9.442223	9.627843
38	10.8277	.0065579	1651.09	0.000	10.81485	10.84056
39	12.1175	.0599507	202.12	0.000	12	12.23501
40	12.07298	.1196754	100.88	0.000	11.83842	12.30754
41	6.711051	.1045582	64.18	0.000	6.506121	6.915981
42	7.784663	.1367028	56.95	0.000	7.51673	8.052595
43	2.930548	.0162975	179.82	0.000	2.898605	2.96249
44	7.99731	.0603153	132.59	0.000	7.879094	8.115525
45	5.44967	.0006596	8261.80	0.000	5.448377	5.450963
46	3.059839	.3324328	9.20	0.000	2.408282	3.711395
47	9.177007	.1045582	87.77	0.000	8.972077	9.381938
48	10.70828	.0041627	2572.44	0.000	10.70012	10.71644
49	7.839968	.000136	5.8e+04	0.000	7.839702	7.840235
50	3.532808	.0724137	48.79	0.000	3.39088	3.674736
51	7.212373	.0724137	99.60	0.000	7.070444	7.354301
52	8.539535	.0356997	239.20	0.000	8.469565	8.609506
53	4.73892	.0724137	65.44	0.000	4.596992	4.880849
54	10.25134	.0160723	637.83	0.000	10.21983	10.28284
55	10.30559	.1045582	98.56	0.000	10.10065	10.51052
56	7.244338	.0160723	450.74	0.000	7.212837	7.275839
57	5.13658	.2936286	17.49	0.000	4.561078	5.712081
58	6.436236	.0481101	133.78	0.000	6.341942	6.53053
59	7.866581	.0231652	339.59	0.000	7.821178	7.911984
60	7.057361	.0724137	97.46	0.000	6.915433	7.199289
61	4.932763	.3378716	14.60	0.000	4.270547	5.594979
62	5.273511	.2493856	21.15	0.000	4.784724	5.762298
63	4.731237	.2581472	18.33	0.000	4.225277	5.237196
64	5.330883	.6515946	8.18	0.000	4.053781	6.607985
65	3.819712	.1608997	23.74	0.000	3.504355	4.13507
66	.2491679	.3298274	0.76	0.450	-.397282	.8956177
67	3.510161	.2051426	17.11	0.000	3.108089	3.912233
68	8.336364	.0502052	166.05	0.000	8.237964	8.434764
69	7.507873	.010828	693.38	0.000	7.486651	7.529095
70	7.589151	.0262541	289.07	0.000	7.537694	7.640609
71	6.206831	.0160723	386.18	0.000	6.17533	6.238332
72	11.76126	.3552601	33.11	0.000	11.06496	12.45755
73	11.04045	.2978917	37.06	0.000	10.45659	11.6243
74	9.425453	.0487135	193.49	0.000	9.329976	9.520929
75	6.93809	.0695614	99.74	0.000	6.801752	7.074428
76	8.639632	.0611711	141.24	0.000	8.519739	8.759525
78	6.842838	.0006596	1.0e+04	0.000	6.841545	6.844131
79	8.104471	.1045582	77.51	0.000	7.89954	8.309401
80	5.493256	.0106363	516.46	0.000	5.472409	5.514102

81	6.849428	.1045582	65.51	0.000	6.644498	7.054358
82	9.01977	.0840845	107.27	0.000	8.854967	9.184572
83	8.525979	.1319566	64.61	0.000	8.267349	8.78461
84	12.45147	.002803	4442.18	0.000	12.44597	12.45696
85	11.29028	.0347915	324.51	0.000	11.22209	11.35847
86	6.647748	.1045582	63.58	0.000	6.442818	6.852679
87	11.949	.1118361	106.84	0.000	11.7298	12.16819
88	4.077677	.1045582	39.00	0.000	3.872746	4.282607
89	8.944645	.0764521	117.00	0.000	8.794802	9.094488
90	9.929647	.0399334	248.65	0.000	9.851379	10.00792
91	5.097964	.0162975	312.81	0.000	5.066021	5.129906
92	8.1865	.0162975	502.32	0.000	8.154558	8.218443
93	-1.068182	.2840314	-3.76	0.000	-1.624874	-.5114913
94	7.927597	.0724137	109.48	0.000	7.785668	8.069525
95	6.448707	.2091647	30.83	0.000	6.038752	6.858662
96	8.227474	.0543369	151.42	0.000	8.120976	8.333972
97	2.191393	.0006596	3322.19	0.000	2.1901	2.192685
_cons	6.503445	.2045792	31.79	0.000	6.102477	6.904413
sigma_u	0					
sigma_e	3.3928362					
rho	0	(fraction of variance due to u_i)				