UNIVERSITAS INDONESIA

TRADE OPENNESS AND FEMALE-MALE EARNINGS DIFFERENTIALS: EVIDENCE FROM INDONESIA

THESIS

MARYAM JAMIELAA
1506698311

FACULTY OF ECONOMICS AND BUSINESS
GRADUATE PROGRAM IN ECONOMICS
DEPOK
AUGUST 2017

UNIVERSITAS INDONESIA

TRADE OPENNESS AND FEMALE-MALE EARNINGS DIFFERENTIALS: EVIDENCE FROM INDONESIA

THESIS

Submitted as a part of the requirement for the Degree of Magister Sains Ekonomi

MARYAM JAMIELAA
1506698311

FACULTY OF ECONOMICS AND BUSINESS
GRADUATE PROGRAM IN ECONOMICS
DEPOK
AUGUST 2017

STATEMENT OF PLAGIARISM

I hereby declare that this thesis is composed without any form of plagiarism, according to rules and regulation in University of Indonesia.

If in the future I was proven to do plagiarism, I will take full responsibility and willing to accept sanction given by University of Indonesia.

Depok, August 22th 2017

Maryam Jamielaa

STATEMENT OF ORIGINALITY

I hereby declare that the intellectual content of this thesis is the product of my own work. I also declare that referencing has been made correctly to the best of my knowledge and any contribution made to the research by others is explicitly acknowledged in the thesis.

Name	: Maryam Jamielaa
Student Number	: 1506698311
Signature	:
Date	: August 22th 2017

AUTHORIZATION PAGE

This thesis is submitted by

Name	: Maryam Jamielaa
Registration Number	: 1506698311
Faculty/Program	: Faculty of Economics and Business, Graduate Program in Economics
Thesis Title	: Trade Openness and Female-Male Earnings Differentials: Evidence from Indonesia.

This assignment has passed examination by the relevant Board of Examiners at the Kobe University and therefore is accepted as part of the requirement to obtain Magister Sains Ekonomi (M.S.E) degree from Graduate Program in Economics, Faculty of Economics and Business, Universitas Indonesia.

BOARD OF EXAMINERS AT KOBE UNIVERSITY

Supervisor: Associate Prof. Koji Kawabata (.....)
Place: Kobe, Date:

Examiner: Associate Prof. Masahiro Kodama (.....)
Place: Kobe, Date:

Examiner: Professor Yuichiro Uchida (.....)
Place: Kobe, Date:

BOARD OF EXAMINERS AT UNIVERSITAS INDONESIA

Director of the Program: Dr. Arie Damayanti (.....)
Place: Depok, Date:

ACKNOWLEDGEMENTS

Foremost, I would like to thank Allah SWT for His blessing, graciousness, and mercies, for me to complete my studies in Kobe University and Universitas Indonesia (UI). Moreover, I would like to give my sincere gratitude and be appreciate to Ministry of Public Works and Housing and BAPPENAS for providing me a lifetime opportunity to pursue my higher education both in Indonesia and Japan.

I would also express my deepest gratitude to main academic advisor, Associated Professor Koji Kawabata, for his guidance and valuable academic advices during my coursework and, especially, in preparing and writing my master thesis. I would like to warmly thank Associate Professor Masahiro Kodama and Professor Yuichiro Uchida for their assistances and constructive suggestions during my thesis writing and final examination. In addition, I also appreciate Dr. Arie Damayanti for discussions and enlightments during my research proposal writing. At the same time, I would like to thank all professors in GSICS Kobe University and Universitas Indonesia (UI) for sharing economics knowledge in theories or practical experiences. I also thank all the administrative staffs in Kobe University and Universitas Indonesia (UI) for their cooperation and helps.

Finally, I would like to dedicate my academic achievement to my parents Mr. Sudirman and Mrs. Ernawati, my parents in law Mr. (Alm.) Idrus Nawawi and Mrs. Aisyah Malinda, my beloved husband Bayu Dwi Samoedra, my beautiful daughter Adeeva Dyandra Larasati, my brothers and sisters, for all their prayers, love, encouragement, motivation and endless supports for me through all these challenging moments in pursuing my goals. Special thanks to my all friends from Casa Del Monte (CDM), PPIE UI, and GSICS Kobe University for all supports, all the good times, all the tears, all the joy and all the shared moments. May our friendships last forever.

Depok, August 22th 2017

Maryam Jamielaa

STATEMENT OF AGREEMENT FOR THESIS PUBLICATION FOR ACADEMIC PURPOSE BY UNIVERSITAS INDONESIA

I, how signed below,

Name	: Maryam Jamielaa
Student Number	: 1506698311
Program	: Graduate Program in Economics
Department	: Economics
Faculty	: Economics and Business
Worked submitted	: Master Thesis

declare to agree to grant the non-exclusive royalty-free right on the submitted work which titled:

Trade Openness and Female-Male Earnings Differentials: Evidence from Indonesia.

to the Universitas Indonesia, for the purpose of development of science. With the right, Universitas Indonesia may store, reproduce, reformat, distribute, and publish the work, in the whole or in part, including any equipment the work may have, as long as my name is clearly indicated as the author and the proprietor of the copyright, which I deem as correct.

Depok,
Date : August 22th 2017
Signed :

(Maryam Jamielaa)

ABSTRAK

Nama	:	Maryam Jamielaa
Program Studi	:	Program Pascasarjana Ilmu Ekonomi
Judul	:	Keterbukaan Perdagangan dan Perbedaan Antara Upah Pria dan Wanita: Bukti Kasus di Indonesia

Dalam dua dekade terakhir, Indonesia mengalami peningkatan pada total perdagangan dan *FDI*. Dalam periode 2008-2014, terdapat bukti kenaikan volume *FDI* yang juga disertai dengan peningkatan perbedaan upah pria dan wanita. Penelitian ini dilaksanakan untuk mengidentifikasi efek dari keterbukaan perdagangan terhadap perbedaan upah antara pria dan wanita dan juga menganalisa perbedaan efek tersebut ditiap distribusi upah. Tesis ini menggunakan data Sakernas 2008-2014 dan data *FDI* dari BKPM. Selanjutnya, setelah mengaplikasikan metode *OLS* dan *Quantile Regression*, terlihat dari hasil regresi bahwa kesenjangan upah antara pria dan wanita lebih besar terjadi pada bagian bawah distribusi upah dibandingkan pada bagian atas distribusi upah. Selain itu, hasil lainnya menunjukan bahwa perbedaan upah antara pria dan wanita di kelompok provinsi berpenghasilan tinggi lebih kecil dibandingkan pada kelompok provinsi berpenghasilan rendah.

Kata kunci: Keterbukaan perdagangan, Kesenjangan Upah AntarJender, Regresi Kuantil.

ABSTRACT

Name	:	Maryam Jamielaa
Study Program	:	Graduate Program in Economics
Title	:	Trade Openness and Female-Male Earnings Differentials: Evidence from Indonesia.

In the past two decades, Indonesia has experienced an increase in total trade and FDI. In the period 2008-2014, there was an increasing of FDI volume, which was followed by a widening trend in the female and male earnings gap. Looking at all that facts, this study investigates the impact of trade openness on female-male earnings differentials and how the impact differs across the wage distribution. This thesis used data employment from the National Labor Survey (SAKERNAS) published by Statistics Indonesia and FDI data released by the Investment Coordinating Board (BKPM). Furthermore, after applying the *OLS* and the *Quantile Regression* estimation method, it appears that gender wage gap is narrower in low quantile wage distributions than in high quantile distributions. In addition, another important finding emerges from the results of income provincial groups, which shows that gender wage differentials are narrower in high-income and middle provinces than in low-income provinces.

Keywords: *trade openness, gender wage gap, Quantile Regression*

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1.
INTRODUCTION

Over the last decade, the implication of trade openness on female-male earnings differentials has triggered a compelling discussion among academics. Since the early 1980s, many developing countries have decided to engage in the global market. As countries became more integrated into the open market, trade volume and direct investments in those countries increased substantially. As a consequence, this impacted many sectors of the economy, including the domestic labor market. According to literature, trade liberalization creates domestic competition which tends to reduce discrimination in the labor market, including gender wage disparity (Becker, 1957). In the past two decades, Indonesia has experienced an increase in total trade and FDI. Moreover, as can be seen in Figure 1.1, the increase of FDI volume was also followed by a widening trend on female and male earnings gap from period 2008-2014. Looking at all that facts, this study investigates the impact of trade openness on female-male earnings differentials and how the impact differs across the wage distribution.

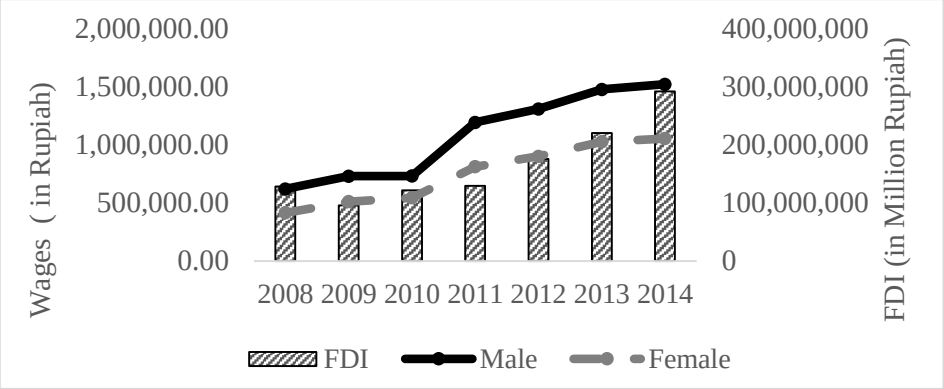

Figure 1.1. Trend in Female-Male Median Wages (Full-Time Workers) and FDI

Source: Statistics Indonesia (BPS)

Trade liberalization affects gender wage differentials in different ways, both in negative and positive ways. First, according to Becker (1957), in order to be competitive with foreign companies, local firms are pushed to be more efficient in operating their production. To be more efficient, local companies will eliminate

their “taste of discrimination” and pay workers’ wage based on their productivity. As a result, the disappearance of discrimination behavior will generate a great reduction in the female-male earnings gap (Artecona and Cunningham,2002; Black and Brainerd, 2004;). Secondly, according to Heckscher-Ohlin (H-O) trade theory, international trade in most developing countries will induce a production shift into labor intensive production which uses low-skilled labor than high-skilled labor. Since, a female stereotype is attached to low-skilled labor, the demand for female workers will be increased and boost their relative wages, and eventually, it is expected to lower discrepancies in female-male earnings (Fitrania, 2013). Other literature suggests that trade openness also creates skilled-biased technical change (SBTC) which makes male workers appear to look more skillful than female workers. This technological upgrading increases of demand for high-skilled labor (Berman et al., 1994; Juhn et al., 2014; Lee and Wie, 2015) and, at the same time, raises demand for male labor (Fussell, 2000).

Gender inequality has been an important issue that should be solved in order to achieve a sustainable economic development, and, one dimension of gender inequality is gender wage disparity. Improvement in gender wage equality is highly correlated with inclusive growth (ADB, 2012). One of the possible way to improve gender equality is by encouraging women in economic development. By encouraging women to contribute in economic development, inclusive economic growth can be gained through three channels which are via accumulated physical and human capital, participation in the labor market, and increased savings (Arora, 2012). In addition, women with higher access to income tend to use a large proportion of their income for health and education which can increase accumulated human capital in society (Thomas, 1990). The importance of women’s participation in economic development has been acknowledged by the Indonesia Government. To assure equal participation of women and men in economic development, the Indonesian Government has gender equality programs on its main agenda, written into the National Medium-Term Development Plan (RPJMN 2015-2019). In 2009, former President SBY signed Gender Mainstreaming Law No.9 to translate the

RPJMN planning into direct implementation which is assigned to the Ministry of Women and Children Empowerment.

Despite of enormous efforts from the Indonesian Government to support women participation in economic development, female-male earnings inequality in Indonesia is still a persistent problem. According to the Human Development Report 2016, Indonesia is still become one of ASEAN members with high gender inequality [Gender Inequality Index (GII) = 0.47]. In terms of wages, female workers still earn less than male labor, with a ratio of about 0.80 (Statistics Indonesia, 2015). In other words, female workers earn 20% less than their male counterparts for doing the same works. Furthermore, looking at the share of national income by gender in period 2008-2014, the share women's national income still below men's and the gap is getting wider up until 2010. This has caused by female-male earnings differentials and imbalance in the proportion between male and female workers in labor force participation (Indonesian Human Development Report Gender-Based, 2014). Regarding this, conducting research on gender wage gap is important, especially at the time when Indonesia will face great foreign competition in the era of globalization.

Furthermore, previous studies related to gender wage disparity are not abundant. Most of the studies tried to identify gender wage gaps in Indonesia without taking into account the effect of trade liberalization. For example, studies conducted by Feridhanusetyawan, Aswicahyono, and Perdana (2001), by Pirmana (2006) and by Taniguchi and Tuwo (2014), only focus on investigating female-male earnings differentials in rural and urban areas by using Oaxaca-Blinder Decomposition and SAKERNAS data in different time period. Similarly, applying a different decomposition method, Sohn (2015) analyzed the gender wage gap using Indonesia Family Life Survey (IFLS) data across a quantile wage distribution without include trade openness variable. There is still only one study that attempt to draw the link between the impact of globalization on the salary gap between men and women. A study by Fitrania (2013) is the only research that tried to draw a relationship between globalization and the gender wage gap across in sub-national analysis in Indonesia, using an alternative measurement for gender wage gap which

is the occupational gender wage gap. Therefore, to contribute to the lack of literature on this issue, this study attempts to conduct a research on the impact of trade openness on gender wage differentials and its impact across quantile wage distribution.

To investigate the effect of trade openness and gendered wages, this study follows the same methodology as Hazarika and Otero (2004) and Han et al. (2012). These studies conduct analysis by combining micro-data level and macro-data level. Moreover, to get a complete picture on the effect of trade openness on gender wage discrepancy, this study also examines the impact of trade liberalization on the gender wage differentials by applying the quantile regression method (QRM). Furthermore, for further analysis, this research classifies all provinces into three province categories, which are low, middle and high income groups, then investigates the impact of trade liberalization on gender wage discrepancy in each provincial group. This paper uses data employment, provincial trade volume and GRDP per province from the National Labor Survey (SAKERNAS) published by Statistics Indonesia, and data FDI released by Investment Coordinating Board (BKPM). The data used in this research is constructed into a pooling cross-sectional data covers 33 provinces in Indonesia in the period 2008-2014.

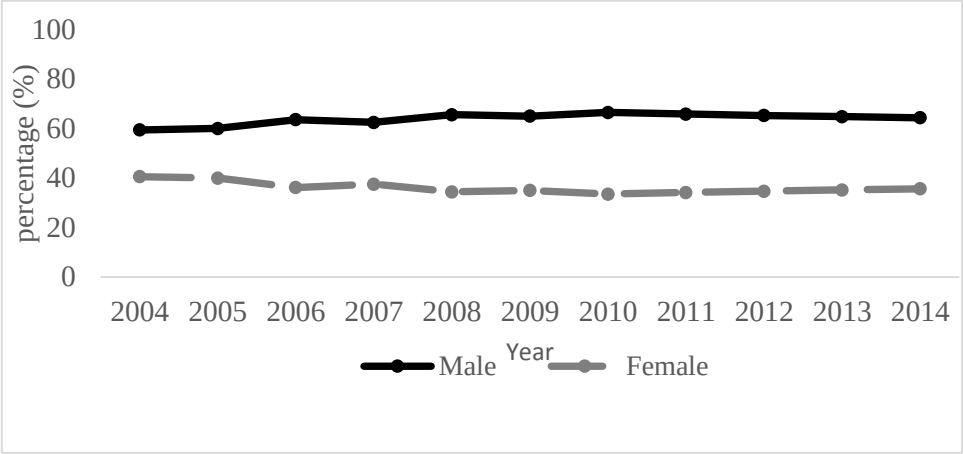

Figure 1.2. Female and Male Share of National Income (2004-2014)

Source: Author's Compilation from Indonesia Human Development Report

In this thesis, there are six chapters. The first chapter is the introduction, which consists of research background, research question and importance of study. Next, chapter II is the literature review which consists of the mechanism how trade openness affects the gender wage gap, literature reviews related to topic and several previous studies of the Indonesia case. In chapter III, methodology and model specification will be presented. Chapter IV describes data and variables that has been used in this study, followed by chapter V for analysis of the results. Finally, chapter VI will present the conclusion, policy implications and limitations of the study.

CHAPTER 2.
LITERATURE REVIEW

The purpose of this literature review is to understand the mechanism how trade openness affects female-male earnings differentials from the existing literature. Firstly, this section will discuss the basic concept of the relationship between gender wage inequality and trade openness. Moreover, by reviewing previous studies, it is expected to discover several methodologies and findings related to female-male earnings disparity and trade liberalization including measurement procedures commonly applied in this topic. Finally, this chapter also highlights several findings on the gender wage gap and international trade from Indonesia-specific research studies.

2.1. Conceptual Framework the Link between Trade Openness and Female-Male Earnings Differentials

In the early 1990s, many developing countries started to engage in the open market. This liberalization process has implications for all domestic sectors, including the labor market. An increase of FDI net inflow into a country because of globalization may trigger the use of relatively more skilled workers in domestic companies (Driffield and Taylor, 2000). Furthermore, international trade is also expected to impact female and male wage differentials. There are two underlying theories that describe the mechanism how trade liberalization can affect the gender wage gap. There are Becker's Discrimination Theory and The Hecksher-Ohlin (H-O Model) trade theory. Beside these theories, there is an emerging concept that explained how gender wage inequality can be happened due to technological advancement, called Skilled-Biased Technical Change (SBTC) Concept.

Becker's Discrimination Theory

As Gary Becker (1957) mentioned in his fundamental paper, every firm has a taste of discrimination. This statement implies that firms can perform a discriminative action by prioritizing (i.e. paying wages) to one preferred group over less-preferred groups. In this case, the preferred group is male workers and female workers are the less-preferable one. Furthermore, he said that, in an open economy,

this act of discrimination will disappear slowly because it will set additional costs to firms. When firms operate in open and integrated markets, they cannot afford additional costs which can make their profits negative (assume that, in competitive market, a firm operates with zero profits). Moreover, when one country engages in trade liberalization, it will bring foreign competitors to the domestic market and put pressure on local markets. In addition, domestic companies are compelled to be more efficient by operating with lower costs and boosting their worker's productivity in order to compete with foreign firms. As a consequence, domestic companies will eliminate their inefficient behavior, such as paying one group more than another group, and this action will naturally erase one of the causes of female-male wage disparity within a firm. Through this mechanism, female-male wage disparity will be narrowed.

The Hecksher-Ohlin Trade Theory (H-O Model)

This theory was developed by Eli Heckscher and Bertil Ohlin which borrows David Ricardo's theory of comparative advantage. They examine the trade pattern of countries when they enter into an open economy by observing their factor endowments. The H-O Model implies that one country tends to shift its production into sectors that intensively use cheap and plentiful factor of production. In most developing countries, they usually focus their production on labor intensive production where low-skilled labor is more abundant than high-skilled labor. As a result, the gender wage gap will be reduced through this mechanism since female stereotype is attached to low-skilled labor.

Skill-Biased Technical Change (SBTC)

Recently, there is emerging empirical evidence that rapid development in technology has an impact on the labor market. A skill-biased technological change can be translated as an exogenous change in the production function that increases the unit demand ratio skilled-labor relative to unskilled-labor at the current wage level (Berman, Bound and Machin, 1998). The existence of a technological upgrade will spur one worker group to appear more skilled than the other worker groups. In this case, female workers, which usually have lower education, will look less

favorable to be hired by firms than male workers. This condition widens the gap between male and female earnings.

2.2. Empirical Evidence on Trade Openness and Female-Male Earnings Differentials

Since the discrimination theory was proposed by Gary Becker in 1957, many researchers attempted to examine trade and gender wage inequality. there are several studies showed that trade liberalization exposure brings a narrowing impact on the gender wage gap. Artecona and Cunningham (2002) and Black and Brainerd (2004) tried to test Becker's Discrimination Theorem by comparing competitive and non- competitive (concentrated) firms. Artecona and Cunningham (2002) used difference in female-male mean log hourly wages as a measurement for the gender wage gap and found that, in Brazil, women workers experienced wage increases especially there who worked in concentrated industries. Similarly, Black and Brainerd (2004) also discovered that as import share is increased, the gender wage gap tends to decline in U.S. manufacturing industries. In India, Reilly and Dutta (2005) also did not found a supporting evidence that trade liberalization is associated with higher gender pay gaps. Moreover, a study by Chen et al. (2013) which used industry-level data has conducted to examine the impact of globalization on the Chinese labor market in 2004. They found that foreign and exporting firms employ more female workers than domestic non-exporters, which significantly encouraged female employment and reduced the gender wage gap in the manufacturing sector. Moreover, Oosterndorp (2009) analyzed the gender wage gap using large cross-country dataset by introducing a new measurement of the gender wage gap, which is occupational gender wage gap. He discovered that trade openness lowers the gender wage gap in upper middle income countries, while there is a little evidence found in lower middle income countries.

On the other hand, in several developing countries, trade liberalization increases female-male earnings differentials. Seguino (1997) conducted a study in South Korea and found that women's relatively lower wages and wage discrimination are associated with weaker women's fallback position in labor

markets. In addition, Berik et al. (2004) compared the impact of international trade on gender wage gap in Taiwan and South Korea. It appears that, in contrast to neoclassical theory, rising import share is positively associated with wage discrimination against women in concentrated industries. Moreover, Menon and Meulen-Rodgers (2009) applied a different approach by replacing cross-sectional long-differenced observations with panel dataset of 28 industries with a 3-digit level. Interestingly, they found an opposite result from Reilly and Dutta's study, an increase in trade openness even worsened the gender wage differentials in the industrial sector.

Most of previous studies above were more focusing on the effect of trade openness on gender earnings differentials within manufacturing industries or firms directly affected by trade reforms. These kind of studies were typically ignoring the contribution of individuals' characteristics, which usually embodied in microdata level, that can provide more scope for discover the mechanisms through which trade liberalization affects gender inequality. There are several studies that attempted to combine macro-data level and micro-data level. Hazarika and Otero (2004) conducted a research to compare gender differentials wages between *maquiladora*[1] and non-*maquiladora* workers in urban Mexico. Using the Mincerian earnings function and added interaction terms between dummy female and dummy for *maquiladora* sector, they found that gender wage differentials decreased more significant in non-maquiladora than in maquiladora. In addition, Braunstein and Brenner (2007) examined the impact of FDI on earnings between female and male workers in China between year 1995 and 2002 by combining individual-data level with FDI and trade per provinces. The results were, that in 1995, women experienced larger gains from FDI than men. While, in 2002, men experienced larger wage gains from FDI than women because of industrial upgrading and gender-based employment segregation. Moreover, a recent study conducted by Han et al. (2012) also applied the same methodology as two previous studies above to see the impact of trade reforms on wage inequality on China. They found that the

[1] Maquiladora industry is an industry for export specialized manufacturing units in Mexico which established under the agreement with United States called *Bracero* Program.

WTO accession was significantly associated with rising wage inequality and more importantly also rising the return of education to college among China workers. By combining microdata and macro data level, it is expected that investigating the impact of trade openness on gender wage gap can be more specifically and comprehensive.

2.3. Indonesia-specific Research Studies on Trade Openness and Female-Male Earnings Differentials

Previous studies in Indonesia related to trade liberalization and the gender wage gap are not abundant. Feridhanusetyawan et al. (2001), investigated the gender wage gap in Indonesia using micro-level data from 1986-1997, the results showed that the gender wage gap still exists in Indonesia even though the trend is declining. Pirmana (2006) uses a new dataset 1996- 2004, found result contradicting with previous studies. He reported that there is an increase in gender earnings inequalities in Indonesia, which is attributed 41.6% to endowment differences and 58.4% to unobserved and unexplained factors. In addition, Taniguchi and Tuwo (2014), found new evidence that the urban gender wage gap is less than the gap in rural areas, moreover, unlike in rural areas, the urban gender wage gap is wider among younger age cohorts. Another study was conducted by Sohn (2015) using 2007 Indonesia Family Life Survey (IFLS) data across quantile wage distribution in Indonesia. By applying quantile regression, he pointed out that the explained gap remains similar across wage distribution, while, unexplained factors decrease in the total gap.

A study by Fitrania (2013) is the only research that tried to draw a relationship between globalization and the gender wage gap across provinces in Indonesia. Following the same method as Oosterndrop (2009), she used the occupational gender wage gap and classified provinces into low- and high income provinces and occupations into low-skill and high-skill occupations. She drew the conclusion that in a developing country like Indonesia, globalization mainly reduces the gender wage gap in low-skill occupations.

2.4. Research Contribution

Since, the literature on gender wage inequality and trade liberalization is still not abundant in Indonesia, this study attempts to contribute to this field. Many other previous studies, which is conducted in Indonesia, only focus on the determinants that causing gender pay gap (explained and unexplained factors) by applying Oaxaca-Blinder Decomposition method. However, this method has several limitations which cannot be used to analyze different discrimination levels in the different percentiles in the income distribution. Therefore, this paper go beyond averages to see a complete understanding about the different effect of trade liberalization on gender earnings differentials across wage distribution using quantile regression method, the same method applied by Han et al. (2012).

CHAPTER 3.
METHODOLOGY

The methodology used in this study are described in this chapter. The first section explains the estimation models and present the regression specification. The mechanism employed for constructing the model in this study is discussed in the first section. Moreover, in the next section, there will be explanations about test specification that has been used in this study.

3.1. Estimation Models

The key objectives of this study is to investigate the impact of trade openness on gender wage inequality, whether the earnings difference between male and female will be narrowed or widened. In this study, the standard Mincerian "human capital model" of wage determination that includes controls for human capital characteristics is adopted. In general, the standard Mincerian wage model is modelled as a linear function of the years of schooling, experience and the squared of experience (Lemieux, 2003).

$$\ln w = \ln w_0 + rS + \beta_1 X + \beta_2 X^2$$

Since, the objectives of this study is to investigate the impact of trade openness on gender earnings differential, several variables are inserted into the standard Mincerian wage model. Following Hazarika and Otero (2004) and Han et al. (2012), these previous studies use the extended Mincerian wage model by introducing interaction term between dummy variable gender and variable trade openness to capture the impact of trade liberalization on female-male earnings differentials.
The baseline specification is as expressed as follows:

$$\ln(W_{i,r,t}) = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 Female_{i,r,t}} + \boldsymbol{\beta_2 Openness_{r,t}} + \boldsymbol{\beta_3 Female_{i,r,t}} \times \boldsymbol{Openness_{r,t}} + \boldsymbol{\beta_4 X_{i,r,t}} + \boldsymbol{\beta_5 Y_{r,t}} + \varepsilon_{i,r,t}$$

where:
i = individual; r = province; t = time period.
$\ln(W_{i,r,t})$ is a natural logarithm of real hourly wage of an individual.

$Female_{i,r,t}$ is a dummy variable (female=1; male=0).

$Openness_{r,t}$ is a variable to measure trade openness exposure in each province. In this study, FDI and Trade as share of GRDP are used.

$Female_{i,r,t} \times Openness_{r,t}$ is an interaction term between the dummy variable gender and variable trade openness, which become the variable of interest in this study.

$X_{i,r,t}$ are control of each individual's characteristics.

$Y_{r,t}$ is a provincial GRDP.

To examine the impact of trade openness on female-male earnings differential, we see the partial effect of the coefficient of interaction term between trade openness variable and the dummy variable gender ($Female_{i,r,t} \times Openness_{r,t}$) on dependent variable ln($W_{i,r,t}$).

$$\frac{\partial(lnWage)}{\partial(Openness)} = \beta_2 + \beta_3 Female$$

If the dummy variable gender (*Female)* = 1, then,

$$\frac{\partial(lnWage)}{\partial(Openness)} = \beta_2 + \beta_3$$

And, if the dummy variable gender (*Female)* = 0, then,

$$\frac{\partial(lnWage)}{\partial(Openness)} = \beta_2$$

If the value of coefficient of β_3 is **positive**, then trade openness has more impact on female's wages than on male's wages, which means that the gender wage gap will be narrowed;

If the value of coefficient of β_3 is **negative**, then trade openness has less impact on female's wages than on male's wages, which means that the gender wage gap will be widened;

Following previous studies by Hazarika and Otero (2004), Braunstein and Brenner (2007) and Han et al. (2012), the model specification above is estimated using the OLS and Quantile Regression estimation method. After that, an *F*-

statistics to determine whether the interaction terms are jointly significant in explaining the difference in the dependent variable is performed. Moreover, after run regression using the OLS estimation method and quantile regression with pooled sample, for further analysis, there will be a second regression with three different samples. The samples are classified into three categories based on income per province, which are low, middle and high income provincial groups. The list of provinces for each provincial income groups can be seen at Appendix A.

3.2. Heteroscedasticity Test

In this study, the Breusch-Pagan Test is applied to determine the presence of heteroscedasticity. To address this problem, the heteroscedasticity-robust standard error is applied. However, Braunstein and Brenner (2009) pointed that a downward bias due to the combination of household data level (data employment) and macro-data (data FDI and Trade). To fix this problem, standard error is clustered on province level.

3.3. Multicollinearity Test

To check the existence of multicollinearity problems, The Variance Inflation Factors (VIF) test was conducted. By looking at Table 3.1., in general, the result shows that most of variables has no multicollinearity problems in this model. However, only for variable *age* and *agesq,* the value of VIF is quite high as expected. In addition, a correlation matrix is also calculated in Appendix B.

Table 3.1. Variance Inflation Factors Test Results

Variable	VIF	1/VIF
female	1.87	0.534246
fdi_grdp1	1.48	0.674761
fdi_female1	1.52	0.659152
trade_grdp1	1.60	0.625970
trade_female1	2.29	0.437169
age	51.69	0.019348
agesq	49.00	0.020407
tenure	1.61	0.620048
work_hour	1.11	0.903607
loc	1.23	0.814524
marital_status	1.52	0.658440
educ_elementary	2.35	0.425530
educ_juniorschool	2.35	0.425646
educ_seniorschool	3.23	0.309371
educ_college	2.68	0.372839
sector_manu	1.96	0.511301
sector_nonmanu	2.13	0.469184
reg_java	1.58	0.633584
lngdp	1.53	0.655295
Mean VIF	6.99	

Source: Author's calculation

CHAPTER 4.
DATA

In this chapter, the data used in this study will be described. The first section, data source will be explained and in the next section, the detailed description of each variable will be presented.

4.1. Data Source

This study uses individual data level and only covers 33[2] provinces in Indonesia (out of 34 provinces) in the period 2008-2014. This study uses secondary data from the National Labor Survey (SAKERNAS) published by Statistics Indonesia (BPS). SAKERNAS data is published twice a year in Semester I in February and Semester II in August. In February, SAKERNAS data only covers individual's data at a provincial level, while, in August, SAKERNAS data includes individual's data more specific at the municipality level. SAKERNAS data provides comprehensive employment data for individual's characteristics, such as age, gender, level of education (the highest level of education attainment), total number of hours of work, sectors, occupation, employment status, and total wage/salary in a week.

Table 4.1. The Total Number of Observations

Year	2008	2009	2010	2011	2012	2013	2014	Total
Observation	761,231	753,618	773,647	491,434	473,539	461,291	456,328	4,171,088

Source: Statistics Indonesia (BPS)

In this study, the observations are limited to individuals who are of working age, between 15 and 65 years old, in the period 2008-2014. In addition, the total number of observations is approximately 4,171,088 records (Table 4.1.). Since, SAKERNAS data is not gathered from the same households every year, then, SAKERNAS data cannot be constructed into panel data. Hence, this study applies pooling cross-sectional data.

[2] This study does not include North Kalimantan Province due to the availability of its data, since North Kalimantan was just established in 2012.

4.2. Data Description

Dependent Variable

1. Natural logarithm form of real wages (lnWage)

   The dependent variable of this study is the natural logarithm of real wages/ hour. It is because wages per hour gives an appropriate comparable unit of analysis for wages, since, working hours of female are fewer than male worker. Wage data in the SAKERNAS is in monthly wages, so, it is converted in hourly wages. The full several steps to converting monthly nominal wages into hourly real wages is presented in Appendix C.

Key Variables

1. *Female*

   In this study, the gender of the individual is represented as a binary value (female = 1; male =0). The coefficient of this variable determines the earnings differentials between male and female.

2. *FDI_GRDP* (%)

   In this study, this variable is one of the measures for openness. This variable is Foreign Direct Investment (FDI) to as a share of GRDP, which is drawn from the Investment Coordinating Board (BKPM). By using this variable, the effect of FDI on wages for male and female can be examined.

3. *Trade_GRDP (%)*

   The other measure of trade liberalization is Trade a share GRDP. In this study, trade is calculated as an aggregate of FOB (Free on Broad) and CIF (Cost Insurance and Freight) divided by GRDP in province level.

4. *FDI_Female*

   In this study, this variable is one of the main variables of interest. By examining this variable, it will be explained how FDI affects the difference between women's wages relative to men's wages.

5. *Trade_Female*

   This variable is the interaction term between trade and dummy variable female. This variable is also expected to capture the effect of trade liberalization on female-male earnings differentials.

Control Variables

The control variables consist of individual's characteristic variable, such as age, age squared, tenure, educational attainment, marital status, location, sectors, occupation, total working hours and region. Beside the characteristic's variables, the natural logarithm of Gross Regional Domestic Product (GRDP) for each province in 2008-2014 is also included. GRDP is in Million Rupiah which is deflated with the Consumer Price Index 2012. After that, real GRDP is converted into the natural logarithm form. The full description of the key and control variables are available in Appendix D.

Table 4.2. Description of Variables and The Expected Signs

Dependent Variable	**Description**
$\ln(w_{i,r,t})$	Natural logarithm of real hourly wage of individual wage in region *r* in period *t.* Data Source: *Indonesian National Labor Surv*ey (SAKERNAS) published by *Statistics Indonesia* (BPS).

Independent Variable	**Description**	**Expected Sign**
Female	Dummy variable for gender Female =1 Male=0	+/-
FDI_GRDP	FDI per province as share of provincial GRDP FDI in million Rupiah Constant 2012 GRDP in million Rupiah Constant 2012	+/-
Trade_ GRDP	Trade (exports plus imports) per province as share of provincial GRDP Trade in million Rupiah Constant 2012 GRDP in million Rupiah Constant 2012	+/-
FDI_Female	Interaction term Female and FDI	+/-
Trade_Female	Interaction term Female and Trade	+/-
Age	Individual's age	+
Agesq	Square of Individual's Age	-
Tenure	How many year individual's working in the same job	+
Work_hours	Total working hours in a week	+
Marital_status	Dummy Variable Married = 1 Not married = 0	+/-
Loc	Dummy Variable Urban = 1 Rural =0	+/-
Educ_elementary	Dummy Variable for highest Certificate in primary school Finished elementary = 1 Not finished elementary = 0	+

Independent Variable	Description	Expected Sign
Educ_juniorschool	Dummy Variable for highest Certificate in junior school Finished junior school = 1 Not finished junior school = 0	+
Educ_seniorschool	Dummy Variable for highest Certificate in senior school Finished senior school = 1 Not finished senior school = 0	+
Educ_college	Dummy Variable for highest Certificate in college and above Finished college = 1 Not finished college = 0	+
Lngdp	The natural logarithm of real provincial GRDP	+/-
Sector_manu	Dummy Variable for sector Manufacturing sector = 1 Agricultural sector = 0	+/-
Sector_nonmanu	Dummy Variable for sector Non-manufacturing sector = 1 Agricultural sector = 0	+/-
Reg_java	Dummy Variable for regions Java Island = 1 Non-Java Islands = 0	+/-
J_prof	Dummy Variable for Occupations Working as professionals = 1 Not Working as professionals = 0	+/-
J_manager	Dummy Variable for Occupations Working as manager = 1 Not Working as manager = 0	+/-
J_admin	Dummy Variable for Occupations Working as administrative staff = 1 Not Working as administrative staff = 0	+/-
J_sales	Dummy Variable for Occupations Working as sales = 1 Not Working as sales = 0	+/-
J_services	Dummy Variable for Occupations Working as service staff = 1 Not Working as service staff = 0	+/-
J_farmer	Dummy Variable for Occupations Working as farmers = 1 Not Working as farmers = 0	+/-
J_prod	Dummy Variable for Occupations Working as production staff = 1 Not Working as production staff = 0	+/-

Source: Author's calculation

CHAPTER 5.
RESULTS AND DISCUSSION

This chapter presents the descriptive analysis and discusses the findings. In the descriptive analysis section, there is information about each variable that has been used. Moreover, in the results section, there are two subsections. The first subsection is a discussion about the impact of trade openness on the gender wage gap in Indonesia as a whole. While, in second subsection, there will be a further explanation about the impact of trade openness on the female-male earnings differentials in three different provincial groups, which are high, middle and low income provinces.

5.1. Descriptive Analysis

As reported in table 5.1 below, the summary statistics, which include the mean, standard deviation, minimum and maximum values for each variable, are presented. The original number of observations is 4,171,088. However, after taking the natural logarithm of individual's real wage and excluding the missing value of several variables (*wages*, *tenure and work_hours*), the number of total observations was reduced to 986,750. For the dependent variable, the natural logarithm of an individual's real wages, the mean value is 8.50 log points; while, the minimum and maximum values are 3.57 and 14.51 log points respectively. In addition, the mean value of FDI as share of GRDP is 0.39, which implies that, on average, FDI contributes 0.39% of total GRDP per province. Moreover, the mean value of trade as a share of GRDP is 32.81, which indicates that the contribution of trade to GRDP is 32.81%.

Furthermore, the summary statistics from the control variables give a rough description of the workforce in the labor market. Firstly, the mean value of variable age indicates that most observations are in a productive age range (more than 36 years old) and have, on average, a total working time of 43 hours per week. Secondly, most observations are married and living in urban areas. Moreover, for educational attainment, the largest proportion of individual's highest educational attainment is Senior High School (34%), while, the smallest proportion is Junior

High School (17%). The number of workers in the manufacturing sectors is lower with comparable the number of workers in agriculture sectors. While, in non-manufacturing sectors, the total number workers are higher than in agricultural sectors.

Table 5.1. Summary Statistics

Variable	Obs	Mean	Std. Dev	Min	Max
A. Dependent Variable					
Lnwage	986,750	8.50	0.88	3.57	14.51
B. Key Variables					
Female	986,750	0.34	0.48	0	1
FDI_GRDP	986,750	0.39	1.62	0	19.28
Trade_GRDP	986,750	32.81	37.24	0	306
FDI_Female	986,750	0.12	0.92	0	19.28
Trade_Female	986,750	11.10	26.65	0	306
C. Control Variables					
Age	986,750	36.61	11.40	15	65
Agesq	986,750	1,470.40	882.45	225	4,225
Tenure	986,750	8.11	8.66	0	99
Work_hours	986,750	43.78	15.54	1	98
Marital_Status	986,750	0.71	0.45	0	1
Loc	986,750	0.59	0.49	0	1
Educ_elementary	986,750	0.20	0.39	0	1
Educ_juniorschool	986,750	0.17	0.38	0	1
Educ_ seniorschool	986,750	0.34	0.47	0	1
Educ_college	986,750	0.19	0.40	0	1
Sector_manu	986,750	0.14	0.34	0	1
Sector_nonmanu	986,750	0.70	0.46	0	1
Lngrdp (Billion Rupiah)	986,750	0.34	0.47	0.004	5.92

Source: Author's calculation

5.2. Results and Analysis

From the results of OLS and Quantile Regression are presented in table 5.2 up to table 5.5. from the key variables, we can draw several conclusions about the female-male earnings differential and the impact of trade openness on it.

5.2.1. Dummy Variable Female *(Female)*

From OLS results, the value of estimated coefficient for dummy variable Female is negative, which indicates women labor earn less than their colleagues. Interestingly, when the quantile regression is applied, the results show that, even though the value of the estimated coefficient is negative, but the magnitude is larger in low-quantile than in high-quantile wage distribution. In low-quantile wage distribution, on average, female labor still earns 52% less comparable with male labor, while in high-quantile wage distribution, female labor 24% less than her coworkers. This finding provides the evidence that, in Indonesian labor market, there is an incidence of "sticky floors effect" which became a factor in the setting of women's wages (Cameron et al., 2015). This phenomenon is usually found in developing countries. Several previous studies which conducted in developing countries, such as India (Khanna, 2012), Vietnam (Pham and Reilly, 2007), Thailand (Adireksombat et al., 2010) and China (Xiu and Gunderson, 2014), also provided strong evidence about sticky floors effect on their local labor market. Moreover, if we take a further analysis, we can see that in high, middle, and low-income provincial groups, the same pattern of the female-male discrepancy also occurs. The apparent difference is that the gap is more severe in high-income provinces than in low-income provinces. In richer and poorer provinces, women labor earns 38% and 31% less than her coworker respectively.

One possible explanation emerges from those previous studies is that female workers at low-quantile wage distribution usually get lower pay because of their low returns to job tenure or experience, low level of education and also a greater burden of their family responsibilities as family taker and childbearing. In Indonesia case, many female workers engage into informal sectors which provides lower pay. Moreover, there are many obstacles for women labor to shift from informal into formal sectors. in Indonesia, one of the prominent obstacles is social norms that discourage women to involve in labor market (Kercheval, 2012). Traditionally, women with children has several family responsibilities that compel them to spend fewer working hours in labor market than her coworkers. This factor makes them less productive and less attractive to the employers. Therefore, this condition also

contributes to the lower of women labor participation in labor market, which lead to the higher female-male earnings differentials in Indonesia.

5.2.2. Variable openness *(FDI_GRDP* and *Trade_GRDP)*

The impact of trade liberalization on wages can examine from the value of the estimated coefficient for *FDI_GRDP* and *Trade_GRDP*. In general, the value the value of the estimated coefficient for both variables are positive. As can be seen in Table 5.2, the increase of 1% of FDI as share of GRDP will be increase wage by 0.016 natural log points. Moreover, the impact of trade liberalization is bigger for workers in high-quantile than in low-quantile wage distribution, which indicates that the salary of workers with high-skilled jobs are more responsive to international trade. This finding is in line with a previous study conducted by Lee and Wie (2015). They found that in Indonesia, FDI caused demand to shift toward more skilled labor and increased their wages. The fundamental factor driving the shifting demand for skilled labor is skilled-biased technological change. In developing countries, like Indonesia, where country has low levels of economic development and technological progress, an increase of FDI or trade can affect demand for more skilled workers. Moreover, their finding even though is contradictive with H-O model, but showed that the increase of 10% point of foreign technological changes measured by FDI net inflow will rise the wage bill of non-productions workers by 5.2% point. It can be concluded that, in Indonesia industries, demand shifts toward skilled workers are influenced by foreign technologies embedded in imported equipment.

Furthermore, the value of the estimated coefficient is larger in high-income provinces than in low-income provinces. It can be seen that, from the OLS results, a 1% increase in FDI share of provincial GRDP can raise wages in high, middle, low income provinces by 7%, 3% and 0.08% respectively. A plausible explanation why this condition exists because richer provinces in Indonesia tend to have good infrastructure and near to government centers, which permitting rich provinces develop of a good industrial base were than poorer provinces. By offering a good quality of infrastructure and industrial base, richer provinces are more productive in operating their business then poorer provinces. Therefore, an increase of FDI will

induce a larger increase of plants' productivity in well-developed provinces than in least-developed provinces. This finding corroborates the idea of Han et al. (2012), who suggested that the impact of trade liberalization contributes to larger wage inequality in high-exposures regions then in low-exposures regions.

5.2.3. **Interaction** term **(*FDI_Female* and *Trade_Female*)**

To determine the impact of trade openness on gender wage differentials, we focus on the value of this interaction term. From overall results, the value of the estimated coefficient for interaction term is positive. This indicates that, with the increase of trade openness, the female-male earnings differentials is expected to be narrowed. Analyzing more specific, the estimated coefficient for interaction term in low-quantile is bigger than in high-quantile wage distribution, which indicates that female workers with low-paid jobs are more benefit from trade liberalization than female workers with high-paid jobs. One plausible explanation for this condition is that, according to Heckscher-Ohlin (H-O) trade theory, the exposure of international trade will automatically induce an increase of demand of abundant factor production, such as labor. Since Indonesia is one of developing countries which has abundant low-skilled labor which is attached with the stereotype of female workers, the presence of international trade induces higher demand of female workers and increases relative wages for female workers. This mechanism leads to a narrowing gender wage gap in Indonesia for workers at bottom wage distribution. On the other hand, a widening impact of FDI on gender earnings differentials might be caused by the presence of technological changes which affects relative wages by shifting demand for high-skilled labor (Lee and Wie, 2015). An upgrading technology also induces the need to employ better-qualified workers which is more beneficial for male workers. The foreign technological change is often embedded imported equipment. To be able to operate the equipment, firms should conduct several on-the-job training for their workers. Moreover, in Indonesia, the employers are more prefer to send male workers to the training than female workers because male workers have longer job tenure than female workers have. Female workers have shorter job tenure because in a certain age, many female workers exit the labor market due to family responsibilities (such

as, married, pregnant or take care their children) and there are so many barriers that prevent them to re-entry the labor market after they exit. Because of this condition, many employers prefer not invest on female workers because they have to spend more money to train a new worker. This condition leads to imbalance skills between women and men in high-skilled jobs, thus, widening the gender wage gap in Indonesia.

Furthermore, comparing results from three provincial income groups, it can be seen that the value of estimated coefficients is higher in high-income provinces than in middle or low-income provinces. It indicates that the effect of FDI on the earnings differentials between female and male workers is narrower in high-income provinces than in middle and low-income province. This finding supports the evidence that a country or a region should reach a certain level of development before gender inequality can be reduced (Dollar and Gatti, 1999). It implies that the improvement in gender wage equality is highly correlated with income province.

5.2.4. Control Variables

For the control variables, all the signs of the estimated coefficients are in line with theory, except *work_hour*. This variable is expected to be positive, however, in this study, *work_hour* interestingly have a negative value. In addition, others variables, such as *age, tenure, location, marital status, and education,* significantly increase individual's wage. While, variable age squared (*agesq*) has a negative and significant estimated coefficient, which indicates that as age is increasing, the productivity will decline and decrease individual's wage. For education variable, it shows that return of education for tertiary education level/ university is highest among other level of education. While, return to education for primary education is the lowest.

Table 5.2. OLS and Quantile Regression Results for All Provinces

	Ln(Wage)			
	OLS	**Q.01**	**Q.05**	**Q.09**
Key Variables:				
Female	-0.30***	-0.42***	-0.27***	-0.22***
	(0.018)	(0.005)	(0.002)	(0.003)
FDI_GRDP	0.016	0.016***	0.015***	0.020***
	(0.010)	(0.001)	(0.0007)	(0.001)
FDI_Female	0.007	0.015***	0.006***	-0.004***
	(0.005)	(0.002)	(0.001)	(0.001)
Trade_GRDP	0.002**	0.001***	0.002***	0.002***
	(0.0008)	(5.31e-05)	(2.51e-05)	(3.67e-05)
Trade_Female	0.0004	0.001***	0.0002***	-0.0004***
	(0.0005)	(8.70e-05)	(4.12e-05)	(6.02e-05)
Control Variables:				
Age	0.04***	0.05***	0.03***	0.03***
	(0.002)	(0.001)	(0.0005)	(0.0007)
Agesq	-0.0004***	-0.0006***	-0.0004***	-0.0003***
	(2.04e-05)	(1.22e-05)	(5.76e-06)	(8.42e-06)
Tenure	0.02***	0.02***	0.02***	0.01***
	(0.0007)	(0.0002)	(0.0001)	(0.0002)
Work_hour	-0.02***	-0.01***	-0.02***	-0.02***
	(0.0005)	(0.0001)	(5.04e-05)	(7.37e-05)
Loc	0.07***	0.10***	0.05***	0.04***
	(0.01)	(0.004)	(0.002)	(0.002)
Marital_status	0.13***	0.15***	0.13***	0.12***
	(0.01)	(0.004)	(0.002)	(0.003)
Educ_elementary	0.13***	0.15***	0.12***	0.10***
	(0.012)	(0.006)	(0.003)	(0.004)
Educ_juniorschool	0.29***	0.31***	0.27***	0.28***
	(0.018)	(0.006)	(0.003)	(0.004)
Educ_seniorschool	0.46***	0.47***	0.46***	0.45***
	(0.03)	(0.006)	(0.003)	(0.004)
Educ_college	0.90***	0.90***	0.88***	0.82***
	(0.037)	(0.008)	(0.004)	(0.005)
Sector_manu	-0.14***	-0.18***	-0.13***	-0.14***
	(0.05)	(0.02)	(0.008)	(0.01)
Sector_nonmanu	-0.16***	-0.30***	-0.13***	-0.10***
	(0.03)	(0.02)	(0.007)	(0.01)
Lngrdp	-0.20***	0.06***	0.02***	0.02***
	(0.07)	(0.002)	(0.0007)	(0.001)
Constant	7.80	6.43***	8.10***	8.74***
	(0.39)	(0.04)	(0.02)	(0.03)
Dummy Region	Yes	Yes	Yes	Yes
Dummy Occupation	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes
N	986,750	986,750	986,750	986,750
R^2	0.397			
Pseudo R^2		0.148	0.267	0.282

Robust standard errors in parentheses are clustered on province. *Coefficient for variables which both interaction terms for FDI and Trade are jointly significant at 1 percent. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation

Table 5.3. OLS and Quantile Regression for High-Income Provinces

	Ln(Wage)			
	OLS	**Q.01**	**Q.05**	**Q.09**
Key Variables:				
Female	-0.32***	-0.44***	-0.30***	-0.22***
	(0.04)	(0.006)	(0.003)	(0.005)
FDI_GRDP	0.07***	0.06***	0.07***	0.09***
	(0.014)	(0.003)	(0.002)	(0.002)
FDI_Female	0.02	0.03***	0.02***	0.008***
	(0.01)	(0.004)	(0.002)	(0.003)
Trade_GRDP	0.004**	0.004***	0.003***	0.004***
	(0.001)	(8.03e-05)	(4.17e-05)	(6.20e-05)
Trade_Female	0.0004	0.001***	0.0004***	-0.001***
	(0.001)	(0.0001)	(7.05e-05)	(0.0001)
Control Variables:				
Age	0.04***	0.04***	0.03***	0.03***
	(0.002)	(0.001)	(0.0006)	(0.0009)
Agesq	-0.0004***	-0.0005***	-0.0004***	-0.0003***
	(2.76e-05)	(1.52e-05)	(7.87e-06)	(1.17e-05)
Tenure	0.02***	0.02***	0.02***	0.01***
	(0.001)	(0.0003)	(0.0001)	(0.0002)
Work_hour	-0.02***	-0.01***	-0.02***	-0.02***
	(0.0007)	(0.0001)	(6.99e-05)	(0.0001)
Loc	0.06*	0.07***	0.04***	0.03***
	(0.03)	(0.004)	(0.002)	(0.003)
Marital_status	0.11***	0.12***	0.11***	0.11***
	(0.02)	(0.005)	(0.003)	(0.004)
Educ_elementary	0.13***	0.17***	0.13***	0.10***
	(0.020)	(0.008)	(0.004)	(0.006)
Educ_juniorschool	0.33***	0.35***	0.31***	0.30***
	(0.023)	(0.008)	(0.004)	(0.006)
Educ_seniorschool	0.52***	0.53***	0.51***	0.50***
	(0.029)	(0.008)	(0.004)	(0.006)
Educ_college	0.99***	0.95***	0.98***	0.93***
	(0.052)	(0.01)	(0.005)	(0.008)
Sector_manu	-0.09	-0.09***	-0.09***	-0.10***
	(0.067)	(0.020)	(0.011)	(0.016)
Sector_nonmanu	-0.16***	-0.24***	-0.14***	-0.09***
	(0.04)	(0.02)	(0.01)	(0.02)
Lngrdp	-0.06	-0.02***	-0.07***	-0.06***
	(0.079)	(0.003)	(0.002)	(0.003)
Constant	9.18***	7.62***	9.59***	9.84***
	(1.51)	(0.07)	(0.04)	(0.06)
Dummy Occupation	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes
N	515,490	515,490	515,490	515,490
R^2	0.413			
Pseudo R^2		0.158	0.272	0.305

Robust standard errors in parentheses are clustered on province. *Coefficient for variables which both interaction terms for FDI and Trade are jointly significant at 1 percent. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation

Table 5.4. OLS and Quantile Regression for Middle-Income Provinces

	Ln(Wage)			
	OLS	**Q.01**	**Q.05**	**Q.09**
Key Variables:				
Female	-0.30***	-0.40***	-0.27***	-0.22***
	(0.013)	(0.008)	(0.004)	(0.006)
FDI_GRDP	0.03*	0.03***	0.02***	0.02***
	(0.014)	(0.003)	(0.001)	(0.002)
FDI_Female	0.01	0.03***	0.007***	-0.005*
	(0.006)	(0.004)	(0.002)	(0.003)
Trade_GRDP	0.0007**	-0.0001*	0.0008***	0.002***
	(0.0003)	(6.78e-05)	(3.27e-05)	(4.70e-05)
Trade_Female	0.0006	0.001***	0.0005***	0.0002**
	(0.0005)	(0.0001)	(5.43e-05)	(7.81e-05)
Control Variables:				
Age	0.04***	0.05***	0.04***	0.03***
	(0.004)	(0.002)	(0.0009)	(0.001)
Agesq	-0.0004***	-0.0006***	-0.0004***	-0.0003***
	(4.36e-05)	(2.32e-05)	(1.12e-05)	(1.61e-05)
Tenure	0.02***	0.02***	0.02***	0.01***
	(0.001)	(0.0004)	(0.0002)	(0.0003)
Work_hour	-0.02***	-0.01***	-0.02***	-0.02***
	(0.001)	(0.0002)	(9.67e-05)	(0.0001)
Loc	0.06***	0.11***	0.04***	0.05***
	(0.015)	(0.006)	(0.003)	(0.004)
Marital_status	0.14***	0.16***	0.13***	0.13***
	(0.014)	(0.008)	(0.004)	(0.006)
Educ_elementary	0.13***	0.14***	0.12***	0.11***
	(0.016)	(0.011)	(0.005)	(0.008)
Educ_juniorschool	0.25***	0.26***	0.23***	0.25***
	(0.021)	(0.012)	(0.006)	(0.008)
Educ_seniorschool	0.40***	0.41***	0.39***	0.39***
	(0.033)	(0.011)	(0.005)	(0.008)
Educ_college	0.79***	0.81***	0.76***	0.69***
	(0.036)	(0.014)	(0.007)	(0.010)
Sector_manu	-0.27***	-0.41***	-0.24***	-0.18***
	(0.072)	(0.029)	(0.014)	(0.020)
Sector_nonmanu	-0.18***	-0.33***	-0.16***	-0.10***
	(0.020)	(0.027)	(0.013)	(0.020)
Lngrdp	0.074*	0.067***	0.064***	0.11***
	(0.035)	(0.005)	(0.002)	(0.003)
Constant	7.10***	6.52***	7.47***	7.18***
	(0.59)	(0.10)	(0.05)	(0.07)
Dummy Occupation	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes
N	249,956	249,956	249,956	249,956
R^2	0.386			
Pseudo R^2		0.149	0.264	0.269

Robust standard errors in parentheses are clustered on province. *Coefficient for variables which both interaction terms for FDI and Trade are jointly significant at 1 percent. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation

Table 5.5. OLS and Quantile Regression Results for Low-Income Provinces

	Ln(Wage)			
	OLS	**Q.01**	**Q.05**	**Q.09**
Key Variables:				
Female	-0.27***	-0.37***	-0.22***	-0.19***
	(0.024)	(0.011)	(0.005)	(0.007)
FDI_GRDP	0.0008	0.005**	0.002	0.0006
	(0.005)	(0.002)	(0.001)	(0.001)
FDI_Female	0.002	0.005*	0.001	-0.002
	(0.002)	(0.003)	(0.001)	(0.002)
Trade_GRDP	0.004**	0.004***	0.003***	0.002***
	(0.001)	(0.0002)	(0.0001)	(0.0001)
Trade_Female	0.0005	0.002***	-0.0002	-0.001***
	(0.00131)	(0.000416)	(0.000203)	(0.000256)
Control Variables:				
Age	0.04***	0.05***	0.04***	0.03***
	(0.003)	(0.002)	(0.001)	(0.001)
Agesq	-0.0005***	-0.0005***	-0.0004***	-0.0003***
	(3.30e-05)	(2.78e-05)	(1.36e-05)	(1.71e-05)
Tenure	0.02***	0.02***	0.02***	0.01***
	(0.002)	(0.0005)	(0.0003)	(0.0003)
Work_hours	-0.02***	-0.01***	-0.02***	-0.02***
	(0.0004)	(0.0002)	(0.0001)	(0.0001)
Loc	0.05***	0.09***	0.03***	0.02***
	(0.01)	(0.008)	(0.004)	(0.005)
Marital_status	0.17***	0.18***	0.17***	0.13***
	(0.02)	(0.01)	(0.005)	(0.006)
Educ_elementary	0.15***	0.15***	0.15***	0.12***
	(0.02)	(0.01)	(0.006)	(0.008)
Educ_juniorschool	0.27***	0.28***	0.26***	0.26***
	(0.036)	(0.014)	(0.007)	(0.009)
Educ_seniorschool	0.39***	0.38***	0.40***	0.38***
	(0.0445)	(0.0135)	(0.00660)	(0.00831)
Educ_college	0.81***	0.85***	0.81***	0.65***
	(0.040)	(0.017)	(0.008)	(0.010)
Sector_manu	-0.38***	-0.48***	-0.35***	-0.31***
	(0.092)	(0.036)	(0.018)	(0.022)
Sector_nonmanu	-0.23**	-0.33***	-0.19***	-0.17***
	(0.075)	(0.033)	(0.016)	(0.020)
Lngrdp	0.055	0.093***	0.047***	0.008***
	(0.031)	(0.005)	(0.002)	(0.003)
Constant	7.47***	5.89***	7.72***	9.09***
	(0.425)	(0.104)	(0.051)	(0.064)
Dummy Occupation	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes
N	221,304	221,304	221,304	221,304
R^2	0.376			
Pseudo R^2		0.144	0.257	0.258

Robust standard errors in parentheses are clustered on province. *Coefficient for variables which both interaction terms for FDI and Trade are jointly significant at 1 percent. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation

CHAPTER 6.
CONCLUSION

The purpose of this study is to investigate the impact of trade openness on female-male earnings differentials across wage distributions in Indonesia. Moreover, to understand further about this issue, the research classifies all provinces in by income into three groups. The relationship between trade openness and the gender wage gap is an important issue, since there is a widening trend in the gender wage gap in line with increasing international trade and FDI in Indonesia. This study employs the extended Mincerian wage model by adding interaction terms between the dummy variable gender and trade openness variable to capture trade openness exposure on female and male wages (Hazarika and Otero, 2004; Han et al., 2012). Furthermore, this study applies two estimation methods, which are the Ordinary Least Square (OLS) and the Quantile Regression. The summary of the main findings, policy implications, and limitations of the study are presented in this chapter.

6.1. Summary of the Main Findings

The main objectives of this research are, first, to see the impact of trade openness on gender wage differentials and, secondly, to examine whether its impact differs across wage distributions. By looking at the estimated coefficient of interaction term between the trade openness variable and dummy variable female (*FDI_Female* and *Trade_Female*), it is concluded that both FDI and trade contribute to the reduction of the gender wage gap in low and middle-quantile wage distributions. While, in high-quantile wage distribution, it appears that trade openness brings negative impact by widening the female-male earnings differential. Moreover, it also can be concluded that FDI gives larger impact on female-male earnings differentials than trade does. For further analysis, the impact of trade liberalization on the female-male earnings differentials is also examined from three different income provincial groups. From overall results, it suggests that the effect of FDI on the earnings discrepancy between female and male workers is narrower in high-income provinces and middle provinces than in low-income province. From

this results, a conclusion can be drawn that the reduction of the gender wage differentials is highly correlated with income provinces.

Another important finding in this study is that female workers in Indonesia, on average, earn less than male workers. From the OLS results, a female worker's hourly wage is 25.9% below a comparable male worker's hourly wage. The evidence from quantile regression, it appears that female-male wage differentials are more severe in lower wage distributions than in higher wage distributions. Moreover, another striking finding is that the impact of FDI on a worker's wages is positive, which means that an increase of FDI will also induce the increase of an individual's real wages. Supporting previous studies by Lee and Wie (2015) and Feenstra and Hanson (1995), this study finds that FDI increases wages for high-skilled labor more than low-skilled labor.

6.2. Policy Implications of the Study

The impact of trade openness on female-male earnings differentials should be of the main agenda to policy makers and academics. From the main findings above, it shows that trade openness might affect the dynamic of gender wage differentials in the local labor market. Evidence from quantile regression results shows that, in high quantile wage distributions, the gender wage gap widens due to the impact of trade openness. one of the issues that emerges from this study is that the larger gap in high-skills occupations is mainly occurred by the imbalance skill levels between male and female workers. To be able to solve this issue, the Indonesian Government should set a policy priority to accomplish an equal opportunity for both women and men to get training or education. Moreover, the Indonesian Government or policy makers should establish a policy intervention to persuade local and foreign firm to provide an equal opportunity for their female and male employees to gain on-the-job training or vocational education programs in order to close the skill gap between female and male labors. By doing this, it is expected that female worker's relative wages will be raise and, eventually, it leads to the reduction of female-male earnings differentials, especially in high-skills occupations.

6.3. Limitation of the Study

In this study, FDI is used as a measurement of trade openness. However, there is a notion that there will be reverse causality between FDI and wages. One of the methods to tackle this problem is by introducing Instrumental Variable (IV) approach. Braunstein and Brenner (2009) suggested several potential instruments such as, infrastructure or geography variables. However, due to the lack of data availability on those variables, IV approach is not addressed in this study.

Moreover, the analysis of cross-sectional sample, the study investigates the impact of trade openness based on 2008-2014 data, which is a period after trade liberalization started in Indonesia. For further research, it would be interesting to investigate the dynamics of gender wage differentials before and after trade liberalization.

REFERENCES

Adireksombat , K., Fang, Z., & Sakellariou, C. (2010). *The Evolution of Gender Wage Differentials and Discrimination in Thailand: 1991-2007: An Application of Unconditional Quantile Regression. Working Paper No. 2010/05.* Economic Growth Centre, Division of Economics . Singapore: Nanyang Technological University .

Arora, R. U. (2012). Gender Inequality, Economic Development, and Globalization: A State Level Analysis of India. *The Journal of Developing Areas, 46*(1), 147-164.

Artecona, R., & Cunningham, W. (2002). *Effects of Trade Liberalization on The Gender Wage Gap in Mexico.* Development Research Group. The World Bank.

Becker, G. (1957). *The Economics of Discrimination.* Chicago: The University of Chicago Press.

Berik, G., Meulen Rodgers, Y. V., & Zveglich, Jr, J. (2004). International Trade and Gender Wage Discrimination: Evidence from East Asia. *Review of Development Economics, 8*(2), 237–254.

Berman, E., Bound, J., & Stephen, M. (1998). *Implications of Skill-Biased Technological Change: International Evidence.* Working Paper, National Bureau of Economic Research, International Trade and Investment, Labor studies and Productivity, Cambridge.

Black, S., & Brainerd, E. (2004). Importing Quality? The Impact of Globalization on Gender Discrimination. *Industrial and Labor Relations Review, 57*(4), 540-559.

Braunstein, E., & Brenner, M. (2007). Foreign Direct Investment and Gendered Wages in Urban China. *Feminist Economics, 13*(3-4), 213 – 237. doi:10.1080/13545700701439432

Cameron , L., Suarez , D. C., & Pye , E. (2015). *Gender Inequality in Indonesia.* Monash University, Center for Development Economic and Sustainability (CDES). Melbourne: Australian Department of Foreign Affairs and Trade (DFAT).

Chen, Z., Ge, Y., Lai, H., & Wan, C. (2013). Globalization and Gender Wage Inequality in China. *World Development, 4*, 256–266.

Dollar, D., & Gatti, R. (1999). *Policy Research Report on Gender Development: Gender Inequality, Income and Growth: Are Good Times Good for Women?* Poverty Reduction and Economic Management Network. The World Bank.

Driffield, N., & Taylor, K. (2000). FDI and The Labor Market: A Review of The Evidence and Policy Implications. *Oxford Review of Economic Policy , 16*(3).

Feenstra, R. C., & Hanson, G. H. (1997). Foreign Direct Investment and Relative Wages: Evidence from Mexico's Maquiladoras. *Journal of International Economics, 42*, 371-394.

Feridhanusetyawan, T., Aswicahyono, H., & Perdana, A. A. (2001). *The Male-Female Wage Differentials in Indonesia.* CSIS Working Paper Series, Center for Strategic and International Studies (CSIS), Department of Economics, Jakarta.

Fitrania, S. (2013). *Master Thesis: The Impact of Globalization on Gender Wage Gap in Indonesia:A Sub-National Level Analysis.* Tilburg University.

Fussell, E. (2000). Making labor flexible: The recomposition of Tijuana's maquiladora female labor force. *Feminist Economics, 6*(3), 59-79.

Han, J., Liu, R., & Zhang, J. (2012). Globalization and wage inequality: Evidence from urban China. *Journal of International Economics, 87*, 288-297.

Hazarika, G., & Otero, R. (2004, June). Foreign Trade and the Gender Earnings Differential in Urban Mexico. *Journal of Economic Integration, 19*(2), 353-373.

Juhn, C., Ujhelyi, G., & Villegas-Sanchez, C. (2014). *Men, Women, and Machines: How Trade Impacts Gender Inequality.* NBR Working Paper, Natioanal Bureau of Economic Research, Cambridge.

Kercheval, J., Markowitz, D., Monson, K., & Read, B. (2012). *Perempuan dalam Kepemimpinan - Penelitian mengenai Hambatan terhadap Ketenagakerjaan dan Pekerjaan Yang Layak bagi Perempuan.* International Labor Organization, Jakarta.

Khanna, S. (2012). *Gender Wage Discrimination in India: Glass Ceiling or Sticky Floor?. Working Paper No.214.* Centre for Development Economics, Department of Economics. New Delhi: Delhi School of Economics.

Lee, J.-W., & Wie, D. (2015). Technological Change, Skill Demand, and Wage Inequality: Evidence from Indonesia. *World Development, 67*, 238-250.

Lemieux, T. (2003). *The "Mincer Equation" Thirty Years after Schooling, Experience and Earnings:. Working Paper No. 62.* Center For Labor Economics. Berkeley: University of California.

Menon, N., & Rodgers, Y. V. (2009). International Trade and the Gender Wage Gap: New Evidence from India's Manufacturing Sector. *World Development, 37*(5), 965–981.

Meulen Rodgers , V. Y., & Zveglich, Jr, J. E. (2012). *Inclusive Growth and Gender Inequality in Asia's Labor Market.* Economics and Research Department. Manila: Asian Development Bank.

Ministry of Children and Women Empowerment of Indonesia. (2014). *Human Development Gender-Based Report 2014.* Jakarta: Ministry of Children and Women Empowerment of Indonesia.

Oostendorp, R. H. (2009). Globalization and the Gender Wage Gap. *The World Bank Economic Review, 23*(1), 141-161.

Pham, T.-H., & Reilly, B. (2007, April 02). The gender pay gap in Vietnam, 1993–2002: A quantile regression approach. *Journal of ASIAN Economics, 18*, 775–808.

Pirmana, V. (2006). *Earnings Differential between Male-Female in Indonesia: Evidence from SAKERNAS Data.* Departement of Economics. Bandung: Padjajaran University.

Reilly , B., & Dutta, P. V. (2005). *The Gender Pay Gap and Trade Liberalisation: Evidence for India.* PRUS Working Paper, University of Sussex, Department of Economics.

Seguino, S. (1997). Gender wage inequality and export-led growth in South Korea. *The Journal of Development Studies, 34*, 102-132.

Sohn, K. (2015). Gender Discrimination in Earnings in Indonesia: Fuller Picture. *Bulletin of Indonesian Economic Studies, 51*(1), 95–121. doi:10.1080/00074918.2015.1016569

Taniguchi, K., & Tuwo, A. (2014). *New Evidence on the Gender Wage Gap in Indonesia: ADB Economics Working Paper Series.* Asian Development Bank. Manila: ADB Economics.

Thomas, D. (1990). Intra-Household Resource Allocation: An Inferential Approach. *The Journal of Human Resources, 24*(4), 635-664.

United Nations Development Programme (UNDP). (2016). *Human Development Report 2016: Human Development for Everyone.* New York: UNDP.

Wooldridge, J. M. (2012). *Introductory Econometrics A Modern Approach: 5th Edition.* Cengage Learning.

Xiu, L., & Gunderson, M. (2014). Glass ceiling or sticky floor?Quantile regression decomposition of the gender pay gap in China. *International Journal of Manpower, 35*(3), 306-325.

APPENDIX 1

Lists of Provincial Income Groups

No	Low-Income Provinces	Middle-Income Provinces	High-Income Provinces
1.	Bengkulu	Nanggroe Aceh Darussalam	North Sumatera
2.	Bangka Belitung Islands	West Sumatera	Riau
3.	West Nusa Tenggara	Jambi	South Sumatera
4.	East Nusa Tenggara	Lampung	Jakarta Capital City
5.	Central Kalimantan	Riau Islands	West Java
6.	North Sulawesi	Special Region of Yogyakarta	Central Java
7.	Central Sulawesi	Bali	East Java
8.	South East Sulawesi	West Kalimantan	Banten
9.	Gorontalo	South Kalimantan	East Kalimantan
10.	West Sulawesi	Papua	South Sulawesi
11.	Maluku		
12.	North Maluku		
13.	West Papua		

APPENDIX 2

Correlation Matrix

	lnwage	female	fdi_grdp1	fdi_female1	trade_grdp1	trade_female1	age	agesq	tenure	work_hour	loc
lnwage	1.0000										
female	-0.1117	1.0000									
fdi_grdp1	-0.0167	-0.0151	1.0000								
fdi_female1	-0.0281	0.1836	0.5476	1.0000							
trade_grdp1	0.0504	-0.0112	0.0712	0.0422	1.0000						
trade_female1	-0.0434	0.5746	0.0266	0.1674	0.4728	1.0000					
age	0.2295	-0.0552	-0.0492	-0.0503	-0.0449	-0.0673	1.0000				
agesq	0.2029	-0.0485	-0.0484	-0.0472	-0.0435	-0.0605	0.9872	1.0000			
tenure	0.2912	-0.0551	-0.0264	-0.0277	-0.0429	-0.0572	0.6015	0.5991	1.0000		
work_hour	-0.3251	-0.1137	0.0247	-0.0055	0.0549	-0.0321	-0.0967	-0.0962	-0.0793	1.0000	
loc	0.0594	0.0578	0.0003	0.0153	0.0817	0.0772	0.0024	0.0016	0.0208	0.1452	1.0000
marital_status	0.2172	-0.1192	-0.0176	-0.0394	-0.0342	-0.0999	0.4315	0.3657	0.2768	-0.0429	-0.0447
educ_eleme~y	-0.1800	-0.0348	0.0015	-0.0075	-0.0186	-0.0269	0.0714	0.0768	-0.0020	0.0249	-0.1401
educ_junio~l	-0.1082	-0.0560	-0.0028	-0.0138	0.0067	-0.0296	-0.0973	-0.0930	-0.0829	0.0745	-0.0215
educ_senio~l	0.0343	-0.0622	0.0132	-0.0007	0.0358	-0.0137	-0.1536	-0.1570	-0.0798	0.0787	0.1384
educ_college	0.3578	0.1491	0.0100	0.0354	-0.0175	0.0720	0.0498	0.0308	0.1157	-0.1529	0.0976
sector_manu	-0.0974	0.0397	0.0038	0.0053	0.0107	0.0304	-0.0883	-0.0845	-0.0526	0.0576	0.0671
sector_non~u	0.1174	0.0704	0.0101	0.0123	0.0037	0.0393	0.0050	-0.0020	-0.0075	0.0771	0.2257
j_prof	0.2591	0.1829	0.0180	0.0459	-0.0151	0.0893	0.0631	0.0513	0.1430	-0.2100	0.0014
j_manager	0.1306	-0.0480	0.0087	-0.0067	-0.0035	-0.0295	0.0847	0.0801	0.0580	-0.0189	0.0173
j_admin	0.1210	0.0496	0.0180	0.0236	0.0086	0.0410	-0.0454	-0.0523	0.0095	-0.0431	0.1136
j_sales	-0.1181	0.1363	-0.0412	-0.0141	-0.0202	0.0638	-0.0267	-0.0165	-0.0926	0.1323	0.0856
j_services	-0.1244	0.0733	0.0097	0.0283	0.0382	0.0710	-0.0146	-0.0102	-0.0740	0.1162	0.0942
j_farmer	-0.0605	-0.1154	-0.0192	-0.0190	-0.0191	0.0726	0.0784	0.0843	0.0613	-0.1608	-0.3386
j_prod	-0.1506	-0.1968	0.0073	-0.0383	0.0155	-0.1102	-0.0775	-0.0753	-0.0988	0.1468	0.0430
reg_java	-0.1235	0.0609	-0.0238	-0.0040	-0.1091	-0.0092	0.0119	0.0141	0.0277	0.1063	0.2072
lngdp	-0.0310	0.0292	-0.1029	-0.0528	0.1026	0.0701	0.0292	0.0327	0.0188	0.0989	0.2019

APPENDIX 2 (continuation)

	marita~s	educ_e~y	educ_j~l	educ_s~l	educ_c~e	se~_manu	se~nmanu	j_prof	j_mana~r	j_admin	j_sales
marital_status	1.0000										
educ_eleme~y	0.0348	1.0000									
educ_junio~l	-0.0182	-0.2221	1.0000								
educ_senio~l	-0.0636	-0.3524	-0.3244	1.0000							
educ_college	0.0583	-0.2377	0.2188	-0.3471	1.0000						
sector_manu	-0.0365	0.0422	0.0727	0.0347	-0.1442	1.0000					
sector_non~u	-0.0066	-0.1844	-0.0775	0.1080	0.2609	-0.6134	1.0000				
j_prof	0.0631	-0.2049	-0.1773	-0.0753	0.5812	-0.1456	0.2587	1.0000			
j_manager	0.0596	-0.0564	-0.0398	0.0025	0.1267	-0.0225	0.0617	-0.0601	1.0000		
j_admin	-0.0229	-0.1595	-0.0889	0.1629	0.1482	-0.0805	0.1791	-0.1610	-0.0509	1.0000	
j_sales	-0.0643	0.0274	0.0424	0.0437	-0.1352	-0.1351	0.2385	-0.1736	-0.0548	-0.1470	1.0000
j_services	0.0598	0.0261	0.0319	0.0177	-0.0911	-0.0706	0.1400	-0.1298	-0.0410	-0.1099	-0.1172
j_farmer	0.0385	0.1933	0.0262	-0.1745	-0.1868	-0.1677	-0.6444	-0.1832	-0.0578	-0.1551	-0.1674
j_prod	-0.0081	0.1221	0.1515	0.0013	0.2939	0.4620	-0.1343	-0.2968	-0.0937	-0.2513	-0.2703
reg_java	-0.0022	0.0228	0.0200	0.0065	-0.0214	0.2331	0.0042	-0.0394	-0.0201	0.0056	0.0625
lngdp	-0.0067	0.0427	0.0424	-0.0005	-0.0655	0.1932	-0.0605	-0.0786	-0.0450	-0.0440	0.0871

	j_serv~s	j_farmer	j_prod	reg_java	lngdp
j_services	1.0000				
j_farmer	-0.1250	1.0000			
j_prod	-0.2026	-0.2858	1.0000		
reg_java	0.0695	-0.2155	0.1171	1.0000	
lngdp	0.0460	-0.1041	0.1043	0.5396	1.0000

APPENDIX 3

Steps to Converting Monthly Nominal Wages to Hourly Real Wages

1. Convert weekly total working hours in a week into monthly working hours.

$$monthly\ working\ hours = weekly\ working\ hours\ \times {}^{30}/_{7}$$

2. Calculate hourly nominal wage

$$hourly\ nominal\ wages = {}^{monthly\ nominal\ wages}/_{monthly\ working\ hours}$$

3. Calculate hourly real wages by dividing hourly nominal wages with consumer price index (CPI 2012 = 100)

$$hourly\ real\ wages = \left({}^{hourly\ nominal\ wages}/_{cpi}\right) \times 100$$

APPENDIX 4

List of Explanatory Variables and Measurement Unit

Independent Variable	Measurement Unit	Data Source
Female		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
FDI_GRDP	Percentage (%)	Development of Foreign Direct Investment Realization Report, Investment Coordinating Board (BKPM)
Trade_GRDP	Percentage (%)	Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
FDI_Female		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Trade_Female		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Age	Years	Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Agesq	Years	Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Tenure	Years	Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Work_hours	Hours	Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Marital_status		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Loc		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Educ_elementary		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Educ_juniorschool		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Educ_seniorschool		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Educ_college		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Lngrdp		GRDP of Provinces in Indonesia by Expenditure Report, Statistics Indonesia (BPS)
Sector_manu		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Sector_nonmanu		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
Reg_java		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
J_prof		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
J_manager		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
J_admin		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)

APPENDIX 4 (continuation)

Independent Variable	Measurement Unit	Data Source
J_sales		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
J_services		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
J_farmer		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)
J_prod		Indonesian National Labor Survey (SAKERNAS), Statistics Indonesia (BPS)