Trade openness and female-male earnings differentials: Evidence from Indonesia

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Article Info

Abstract

In the past two decades, Indonesia has experienced an increase in total trade and FDI. In the period 2008-2014, there was an increase of FDI volume, which was followed by a widening trend in the female and male earnings gap. 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. Also, another important finding emerges from the results of provincial income groups, which shows that gender wage differentials are narrower in high-income and middle provinces than in low-income provinces.

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, the increase of FDI volume was also followed by a widening trend on female and male earnings gap from period 2008-2014. This study investigates the impact of trade openness on female-male earnings differentials and how the impact differs across the wage distribution.
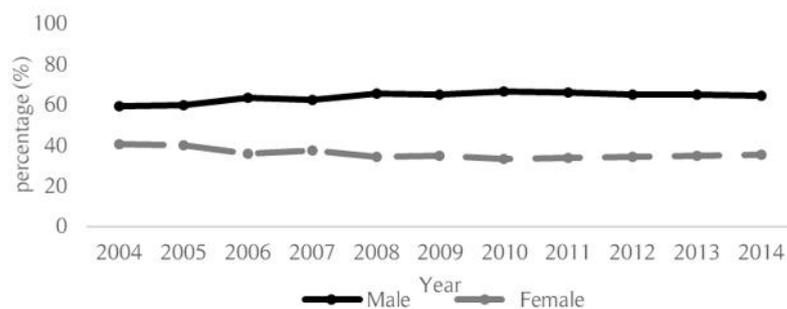
Figure 0. Female and Male Share of National Income (2004-2014)
Source: Author's Compilation from Indonesia Human Development Report

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, Feridhanusetyawan, Aswicahyono, & Perdana (2001), Pirmana (2006), and Taniguchi & Tuwo (2014) only focus on investigating female-male earnings differentials in rural and urban areas by using Oaxaca-Blinder Decomposition and SAKERNAS data in the different 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

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include trade openness variable. However, those studies only focused on decomposing gender wage gap in Indonesia without taking into account contribution of globalization. Therefore, to contribute to the lack of literature on this issue, this study attempts to research the impact of trade openness on gender wage differentials and its impact on quantile wage distribution.

To investigate the effect of trade openness and gendered wages, this study follows the methodology of Hazarika & Otero (2004) and Han et al. (2012). These studies analyze 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, and 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.

Research Method

The key objectives of this study are 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 modeled as a linear function of the years of schooling, experience and the squared of experience (Lemieux, 2003).

$$\ln w = \ln w_0 + rS + \beta_1 X + \beta_2 X^2 \tag{1}$$

Since the objectives of this study are 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) Braunstein and Brenner (2007), 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:

$$\ln(W_{i,r,t}) = \beta_0 + \beta_1 Fema_{i,r,t} + \beta_2 Openness_{r,t} + \beta_3 Female_{i,r,t} \times Openness_{r,t} + \beta_4 X_{i,r,t} + \beta_5 Y_{r,t} + \varepsilon_{i,r,t} \tag{2}$$

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 the interaction term between trade openness variable and the dummy variable gender ($Female_{i,r,t} \times Openness_{r,t}$) on the dependent variable $\ln(W_{i,r,t})$.

Where:
$$\frac{\partial(lnWage)}{\partial(Openness)} = \beta_2 + \beta_3 Female$$
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 the 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 Hazarika & Otero (2004), Braunstein & Brenner (2007), and Han et al. (2012), the model specification is estimated using the OLS and Quantile Regression estimation method. Moreover, after running a regression using the OLS estimation method and quantile regression with the 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.

This study uses individual data level and only covers 33[1] 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), the total number of hours of work, sectors, occupation, employment status, and total wage/salary in a week.

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. Also, the total number of observations is approximately 4,171,088 records. 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.

Results and Discussion

A Dummy variable for female

From OLS results, the value of the estimated coefficient for dummy variable Female is negative, which indicates women labor earn less than their colleagues (Table 1). 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 (Table 2, Tabel 3 and Table 4). 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 & Reilly, 2007), Thailand (Adireksombat et al., 2010) and China (Xiu & 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 in 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 the labor market (Kercheval, 2012). Traditionally, women with children have 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 the labor market, which leads to the higher female-male earnings differentials in Indonesia.

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

Variable of openness

The impact of trade liberalization on wages can examine 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 1, the increase of 1% of FDI as a 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 is 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 the 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 would raise 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 than in low-exposures regions.

Interaction term

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 are 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 & 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 & Gatti, 1999). It implies that the improvement in gender wage equality is highly correlated with income province.

Control variables

For the control variables, all the signs of the estimated coefficients are in line with theory, except work_hour (Table 1). This variable is expected to be positive, however, in this study, work_hour interestingly have a negative value. Also, 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 another level of education. While a return to education for primary education is the lowest.

Table 1. 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

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

Table 2. 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

Note: Robust standard errors in parentheses are clustered on the 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

Table 3. 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

Note: Robust standard errors in parentheses are clustered on the 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

Table 4. 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

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

Conclusion

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 the 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 & Wie (2015) and Feenstra & Hanson (1995), this study finds that FDI increases wages for high-skilled labor more than low-skilled labor.

The impact of trade openness on female-male earnings differentials should be of the main agenda to policymakers 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 emerge 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 policymakers 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 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.

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