Deriving Indonesia's Value of Statistical Life

Abstract

This paper uses the hedonic wage method to directly estimate Indonesia's value of statistical life (VSL). However, there exists selection bias; individuals first determine whether to engage in paid or unpaid labor before choosing from the available job opportunities. To account for this selection decision, this paper incorporates Heckman's sample selection model. The microdata of the labor market is obtained from Statistics Indonesia's National Labor Force Survey; it includes information on the working age sample's personal, occupational, firm, and geographical characteristics. Records of the occupational risk rate are drawn from Indonesia's Social Security Administrator for Labor Force (Badan Pusat Jasa Ketenagakerjaan or BPJS). From the hedonic wage model, Indonesia's VSL is estimated to be around US $950,000.

Introduction

Government institutions design programs that aim to curtail fatality rate. However, before implementation, a cost-benefit analysis is needed to appraise its profitability. While the cost refers to the required allocated resources, the benefit is the monetary impact in reducing the fatality rate or namely, the value of statistical life (VSL).

VSL is the monetary value placed by society on the reduced probability of death (Viscusi & Aldy, 2003, p. 6). It is essential in policy making as a reference point to balance the "additional risk reduction [with] incremental costs" (ibid., p.1). Nevertheless, direct estimates of VSL have been limited to developed countries, with little to almost no studies on developing countries. For instance, existing estimates of Indonesia's VSL are derived from the VSL of 13 developed countries adjusted to account for the difference in GDP per capita (Miller, 2000, p. 169). However, VSL also depends on the population's economic and demographic characteristics. This paper aims to estimate the VSL of Indonesia directly through the hedonic wage model.

There are three main approaches in deriving a VSL estimate: cost of compensation, human capital and willingness-to-pay (WTP). The cost of compensation approach equates the VSL to the compensation paid to accident victims by insurance companies (Biasque, 2012, p.5). Generally, these are based on the cost of the medical bills or lost wages multiplied by a number between 1 to 5 depending on the severity of the injury (Alllaw, 2020). Although this approach is simple and straightforward, it only encompasses the monetary impact of insured losses. Alternatively, the human capital approach regards the VSL as the monetary impact of the death or injury to the economy. It equates the VSL to the individual's present value of future expected earnings (Anderson & Treich, 2008, p. 8). There are two major drawbacks to this approach. First, it assigns a zero value to the VSL of those who are not working. It excludes individuals who are in unpaid labor, unemployment or not participating in the labor force. Second, it does not reflect the individual's preference for safety. On the contrary, the WTP approach estimates the VSL directly from society's stated or revealed preferences for safety (Mardones & Riquelme, 2018, p. 816). In stated preference, individuals are asked directly through surveys what their WTP given hypothetical reductions in risk level. In revealed preference or the hedonic wage model, society's WTP is reflected through the wage-risk trade-off. Using labor market information, VSL is estimated by the monetary amount that a worker has to be compensated to accept a small increase in occupational risk.

Methodology

Hedonic Wage Model

In measuring the monetary compensation for a riskier job, the model treats wage as a composite good (Anderson & Treich, 2008, p. 14). The price of labor is affected by the job's difficulty level, reputation, nature of workplace, including the inherent risk level (Majumder & Madheswaran, 2017, p. 529). There is a positive relationship between wage and the level of risk from both the employers' and employees' side. On one hand, demand for labor decreases when the total cost of hiring workers increase (Viscusi & Aldy, 2003, p. 7). This means that maintaining a safer working condition decreases the wage paid to employees. On the other hand, given identical job characteristics, employees will demand compensation in wage for an increase in risk level.

$$EU(w,r) = (1-r)\cdot u_a(w) + r\cdot u_d(w) \quad (1)$$

$EU\ (w,r) = expected\ utility\ given\ a\ certain\ wage\ and\ fatal\ rate$
$w = monthly\ wage\ received$
$r = occupational\ fatal\ risk\ rate$
$u = utility\ when\ alive\ (u_a)\ or\ dead\ (u_d)$

As represented in Equation 1, all employees possess an expected utility function that represents their preferences in the trade-off between wage and risk level. They will choose the combination from the available job opportunities that maximizes their expected utility. VSL is essentially the difference in the utility levels divided by the expected marginal utility of income, as reflected in Equation 2.

$$VSL = \left.\frac{dw}{dr}\right|_{EU=k} = \frac{u_a(w) - u_d(w)}{(1-r)u_a'(w) + ru_d'(w)} \quad (2)$$

Despite available labor market information, it is difficult to identify wage differentials exclusively caused by the difference in risk levels. Thus, a statistical model in the form of a linear regression equation is needed to isolate the effects of various wage-determinants. The general model for the hedonic wage method is expressed in Equation 3 below.

$$ln(w_i) = \beta_0 + \beta_k X_{ki} + \varepsilon_i \quad (3)$$

$\beta = parameters$
$X_{ki} = i-th\ observations\ that\ correspond\ to\ personal, occupation, geographical\ characteristics\ (including\ rate\ of\ occupational\ fatal\ and\ non-fatal\ risk)$
$\varepsilon_i = error\ term$

Despite all this, the hedonic wage model still produces estimates that vary significantly. In 2001, the US Environmental Protection Agency reported estimates of VSL for policy making that ranges from $0.7 million to $12.9 million (EPA, 2017). There are three main sources of variations. First, variations often come from measurement errors in the key variable, the occupational fatality rate. Ideally, the fatality rate should reflect the individual's perception and aversion to those risks (ibid.). Past literature has attempted to use instrumental variables that could accurately represent these perceptions. However, present microdata of Indonesia's working population lack variables that may serve this purpose. Second, omitting crucial variables such as the occupational non-fatality rate can create a biased VSL estimate. This paper counters this issue by including occupational fatal, non-fatal and disable risk rate as regressors in the hedonic wage model. Third, there exists selection bias; the sample is not completely random (Graves, 2011, p.192). Before individuals choose from the available job opportunities, they evaluate as to whether they should enter the labor force as a paid employee. Without accounting for the individual's characteristics that lead to this decision, the selection bias can lead to inconsistent estimates.

Heckman's Selection Model

The hedonic wage model aims to estimate the wage offer equation for all individuals of working age. However, data relating to wage is only observable to those who are employed and are paid. This excludes individuals who are unemployed or are doing unpaid labor. In this case, unpaid labor refers to unpaid family members that directly contribute to market work that belongs to another member of the household (Philipps, 2008, p. 1). It is not directly remunerated, falls outside of the national income accounts but within the general production boundary (Hirway, 2015, p.1). This paper incorporates the Heckman's selection model into the hedonic wage model to account for variables that affect the individual's decision to engage in either unpaid or paid labor.

The model comprises of two sequential regression equations: the selection equation and the outcome equation. As reflected in Equation 4, the selection equation is a probit model with unpaid or paid labor dummy variable as the regressand. Using censored data that includes all paid and unpaid workers, I regress the dummy variable against the individual's personal, occupational, and geographical characteristics, including non-wage determinants like the number of family dependencies or the number of children.

$$Y_i = \alpha_0 + \sum_k \alpha_k X_{ki} + \eta_i$$

$$IMR = \frac{\phi(\alpha' X)}{1 - \Phi(\alpha' X)} \quad (4)$$

$Y_i = 1\ if\ the\ individual\ engages\ in\ paid\ labor, 0\ if\ unpaid$
$IMR = Inverse\ Mill's\ Ratio$
$\phi(.) = probability\ density\ function$
$\Phi\ (.) = cumulative\ distribution\ function$

The Inverse Mills Ratio from Equation 4 is then added as an additional regressor in the outcome equation in Equation 5 where non-wage determinants as regressors are removed. Additionally, the outcome equation has expected wage earnings as the regressand.

$$E[ln(w_i)|Y_i = 1] = \beta_0 + \beta_k X_{ki} + \beta_{k+1} IMR + \varepsilon_i \quad (5)$$

The coefficient of the fatal occupational risk rate from Equation 5 is then used to compute the VSL estimate.

$$VSL = \beta_r \times 12w \times u \quad (6)$$

$\beta_r = parameter\ of\ the\ occupational\ fatality\ rate$
$u = unit\ of\ measurement\ for\ the\ occupational\ fatality\ rate$

Data Evaluation

Labor Market Information

This paper's labor market information is drawn from the National Labor Force Survey collected by Statistics Indonesia (Badan Pusat Statistik) in August 2019. This cross-sectional household survey contains a sample of the personal, occupational, and geographical characteristics of Indonesia's working age population (Dong, 2016, p.343). It comprises of 782,789 observations, representing 0.4% of the total population. Approximately two- thirds of the sample is employed and 36% of the individuals in the employed subsample are not being paid.

Occupation is categorized into nine groups: administrator, manager, professional, technicians, manufacturer, service/sales, skilled agricultural workers, police/military and unskilled worker. The first four groups are identified as white-collar workers while the latter as blue-collar workers. As seen in Table 1, blue-collar workers represent more than 85% of all workers in each specific industry except within finance, real estate & services, social services, and utility. Overall, 83.9% of all workers are blue-collar workers.

Table 1: Distribution of Blue- and White-Collar Worker

Industry	Total (%)	Blue	White
(1) Agriculture & Fishery	36.4	36.1 (99.2)	0.3 (0.8)
(2) Construction	5.9	5.4 (91.5)	0.5 (8.5)
(3) Finance, Insurance, Real Estate	2.2	0.9 (40.9)	1.3 (59.1)
(4) Mining	1.6	1.4 (87.5)	0.2 (13.5)
(5) Manufacturing	11.0	10.1 (91.8)	0.9 (8.2)
(6) Trades, Restaurant and Accommodation	22.3	20.9 (93.7)	1.4 (6.3)
(7) Social Services	15.8	5.1 (32.3)	10.8 (67.7)

Industry	Total (%)	Blue	White
(8) Transportation and Communication	4.2	3.7 (88.1)	0.5 (11.9)
(9) Utility	0.6	0.4 (66.7)	0.2 (33.3)
Total	100	83.9	16.1

The sample provided by the National Labor Force Survey reflects two main trends consistent with existing literature of unpaid labor. First, the distribution of unpaid labor is skewed gender-wise; the burden of unpaid and paid labor is distributed unequally amongst men and women (Swiebel, 1999, p.11). As shown in Table 2, there is an equal ratio of women to men engaged in unpaid labor but in the realm of paid labor, 64% of all employees are men. Reiterated by existing literature on unpaid labor, women carry out at least "two and a half times more unpaid household and care work" than men (UN Women, n.a.); this means there is less time to engage in paid labor or work longer hours. Table 3 shows that there is a higher proportion of married individuals doing unpaid labor although this difference is not significant. Simultaneously, the average age of unpaid worker is slightly higher. These three observations confirm that most unpaid workers are family members, wives or older relatives that help out informally with business operations and benefit from the increase in profit or wage (Philipps, 2008, p. 21). Second, unpaid working time amounts to paid employment; the average working hours of the unpaid and paid labor sample is not significantly different (Swiebel, 1999, p.7).

Table 2: Distribution of Unpaid and Paid Labor by Gender

	Male	**Female**	**Total**
Unpaid Labor	97,804 (18.9%)	90,582 (17.5%)	188,386 (36.4%)
Paid Labor	210,780 (40.8%)	117,631 (22.8%)	328,411 (63.6%)
Total	308,584 (59.7%)	208,213 (40.3%)	516,797 (100%)

Table 3: Personal Characteristic Variables and Statistics (partial)

Variable	**Definition**	**Mean (Standard Deviation)**			
		Full Sample	**Employed**	**Unpaid**	**Paid**
Paid/ Unpaid Labour	1 if paid labour, 0 if unpaid		0.64 (0.48)		
Gender	0 if male, 1 if female	0.51 (0.50)	0.40 (0.49)	0.48 (0.50)	0.36 (0.48)
Age	In years	40.57 (16.45)	41.85 (13.81)	44.13 (14.70)	40.53 13.09)
Marital	1 if married, 0 otherwise	0.67 (0.47)	0.75 (0.43)	0.80 (0.40)	0.72 (0.45)
Family	Number of family members	4.13 (1.72)	4.06 (1.70)	4.09 (1.70)	4.04 (1.70)
Family_5	Number of family members under the age of five	0.30 (0.55)	0.30 (0.55)	0.29 (0.55)	0.32 (0.56)
Schooling	In years	8.15 (4.79)	8.28 (4.96)	6.73 (4.70)	9.17 (4.88)
Training	1 if the individual has done some training	0.09 (0.29)	0.11 (0.31)	0.05 (0.23)	0.14 (0.34)
Working Experience	In years		10.36 (10.46)	12.50 (11.59)	9.14 (9.54)
Workh_w	Hours worked per week		39.79 (17.20)	35.40 (18.45)	42.30 (15.9)
Tech	1 if the job requires the use technology		0.32 (0.47)	0.18 (0.38)	0.41 (0.49)

Another trend reflected in the sample is that most unpaid labor deals with manual, physical work that requires little to no formal training or education. As shown in Table 3, there are less unpaid workers using technologies in their job, compared to paid workers. This can be attributed to how the workers are distributed by industry as shown in Table 4. The industry with the highest ratio of unpaid to paid workers is the agriculture & fishery industry, followed by trades,

restaurants & accommodation, and manufacturing. These industries with the highest ratios are also industries whereby knowledge or training of the job can be passed down without formal education. This is further shown in Table 3 where on average, unpaid workers have only attained an elementary level education. On the contrary, paid workers have generally attained an additional three years of education and are more likely to have completed a formal training with certification.

Table 4: Distribution of Paid and Unpaid Worker

(The bracket represents the percentage of paid or unpaid workers in each industry)

Industry	Total (%)	Paid	Unpaid
(1) Agriculture & Fishery	36.4	14.1 (38.7)	22.4 (61.3)
(2) Construction	5.9	5.4 (90.8)	0.5 (9.2)
(3) Finance, Insurance, Real Estate	2.2	2.0 (90.0)	0.2 (10.0)
(4) Mining	1.6	1.4 (87.3)	0.2 (12.7)
(5) Manufacturing	11.0	8.1 (73.2)	3.0 (26.8)
(6) Trades, Restaurant and Accommodation	22.3	12.9 (57.9)	9.4 (42.1)
(7) Social Services	15.8	15.4 (96.9)	0.5 (3.1)
(8) Transportation and communication	4.2	3.9 (93.8)	0.3 (6.2)
(9) Utility	0.6	0.5 (90.7)	0.1 (9.3)
Total	100	63.5	36.5

Occupational Risk Rate

The industry-level data of the occupational risk rate is obtained from Indonesia's Social Security Administrator for Labor Force (Badan Pusat Jasa Ketenagakerjaan or BPJS). This public legal institution aims to protect workers through four social security programs: occupational accident, death, old-age, and pension. With regards to the occupational accident benefit program, contribution rates paid by the employers depend on the risk level in the workplace. It is evaluated once every two years and consists of five levels with 0.24% of the monthly wage being assigned to workplaces with the lowest risk and 1.76% to those of the highest risk.

BPJS provided this paper with two datasets reported in Appendix B and C: the number of industry-level reported incidents and the number of workers who have opted into the program. These were then used to compute the industry-level occupational risk rate, which were then matched accordingly with individual workers. In 2019, there was a total of 114,235 incidents with a total of 19.6 million workers opted in. The ranking of industries by risk as shown in Table 5 is reasonable, as it aligns with the trend shown in other countries. The construction industry has the highest fatality rate, followed by the transportation & communication and the utility industry. Additionally, the manufacturing industry has the highest non-fatality rate.

Table 5: Occupational Risk Rate by Industry per 10,000 Workers

Industry	Fatal	Non-Fatal	Disability
(1) Agriculture & Fishery	2.065	105.356	5.044
(2) Construction	5.927	68.509	16.626
(3) Finance, Insurance, Real Estate	1.130	17.161	3.41
(4) Mining	2.376	30.725	10.959
(5) Manufacturing	1.325	114.55	2.879
(6) Social Services	0.791	12.102	1.093
(7) Trades, Restaurant and Accommodation	1.181	27.143	1.200
(8) Transportation and communication	2.671	41.020	6.252
(9) Utility	2.623	28.786	8.576

But regardless, there exists three main limitations with the data. First, the occupational risk rate is computed from the number of reported incidents. It is limited to workers who have opted into the social security programs and can be categorized into employees, independent workers, construction workers, and migrant workers. With the majority of employees in the program working in a formal, urban setting, this excludes occupational incidents that occur to rural independent and/or unpaid workers. Consequently, the occupational risk rate should be significantly higher in industries with these workers, like the agriculture & fishery industry. Second, the occupational risk data assumes that all workers in one industry face the same risk. In approaching this limitation, this paper chooses to supplement the analysis by processing the blue- and white-collar samples separately and placing more emphasis in the blue-collar samples. Third, because the occupational risk data is reported by industry, the difference in wage may be caused by wage differentials between industry, not risk. This could potentially be resolved by adding an industry dummy variable to Equation 4 and 5. However, because the occupational risk rate is already at industry-level, this would lead to a linearity problem. Further exploration can be made by obtaining data of risk rate at occupation- and industry-level.

Discussion of Results

The following section discusses the implication of the selection and outcome equations and whether it reflects existing literature and/or present conditions.

Selection Equation

The selection equation is a probit regression that models an individual's decision to engage in either unpaid or paid labor. The coefficients of the equation as shown in Table 6 gives the change in the z-score for a unit change in the regressand.

Overall, all variables are significant at a statistical level of 0.01 except for variables of disability and some provinces. Only the disability variable that relates to walking affects an individual's selection decision; it reduces the likelihood of engaging in paid labor. Disability is not a significant determinant of paid vs unpaid labor, but it is in deciding whether to enter the labor force. This paper repeated the methodology but changed the dummy variable in Equation 4 to represent labor force participation. All variables relating to disability except for one that deals with visual impairment are significant at a statistical level of 0.05 or 0.01.

As reiterated in the Data Evaluation section and reflected in Table 6, women are more likely to perform unpaid labor and this has both historical and contemporary origins. Historically, women and children were involved in production. In contemporary terms, having an available family member increases the earning capacity of the individual (Philipps, 2008, p. 22). This explains why being married also increases the likelihood of engaging in unpaid labor. The parameter of the family variable is positive, meaning that the bigger the family, the more likely the individual participates in unpaid labor. Conversely, having more children increases the likelihood of participating in paid labor. On one hand, parents with smaller kids are more likely to stay at home to take care of them. On the other hand, they require additional income to support their child. Non-wage determinants like the number of family members or children show the significance of accounting for that selection decision to enter either unpaid or paid labor.

The lack of literature on unpaid labor makes it difficult to evaluate some aspects of the selection equation. For instance, the coefficients in experience and schooling are negative. This indicate that keeping other variables constant, an additional year of schooling or work experience reduces the likelihood of engaging in paid labor. This trend is seen in both blue- and white-collar worker.

Table 6: Coefficients of the Selection Equation Regression Analysis (partial)
(The full result is displayed in the Appendix D)

Dependent Variable: Dummy variable that represents paid or unpaid labour (1 if paid labor, 0 otherwise)

Independent Variables	Definition of Variables	Coefficient (Standard Errors)		
		All	Blue-collar	White-collar
Gender	0 if male, 1 if female	-0.272 (0.006) ***	-0.285 (0.006) ***	0.059 (0.027) ***
Rural_urban	0 if the individual lives in a rural setting, 1 if the individual lives in an urban setting	0.173 (0.005) ***	0.182 (0.006) ***	0.024 (0.024) ***
Age	In years	0.005 (0.000) ***	0.006 (0.000) ***	-0.008 (0.001) ***
Marital	1 if married, 0 otherwise	-0.247 (0.006) ***	-0.245 (0.006) ***	-0.242 (0.028) ***
Family	Number of family members	-0.063 (0.002) ***	-0.065 (0.002) ***	-0.023 (0.007) ***
Family_5	Number of family members under the age of five	0.191 (0.006) ***	0.201 (0.006) ***	0.003 (0.025) ***
Gender * Famlly_5	Interaction term between gender and the number of family members under the age of five	-0.132 (0.009) ***	-0.135 (0.009) ***	-0.091 (0.039) ***
Disability1	1 if suffers from visual impairment, 0 otherwise	-0.041 (0.067)	-0.039 (0.070)	-0.155 (0.266)
Disability2	1 if suffers from speech impediment, 0 otherwise	0.011 (0.057)	0.000 (0.058)	0.413 (0.339)
Disability3	1 if struggles in walking, 0 otherwise	-0.055 (0.016) ***	-0.056 (0.016) ***	-0.066 (0.086) ***
Disability4	1 if struggles in holding, 0 otherwise	0.013 (0.026)	0.010 (0.026)	0.054 (0.144)
Disability5	1 if has other disabilities, 0 otherwise	0.009 (0.028)	0.011 (0.028)	0.061 (0.180)
Experience	Working experience in years	-0.011 (0.000) ***	-0.011 (0.000) ***	-0.008 (0.001) ***
Schooling	Number of years in education	-0.011 (0.000) ***	-0.010 (0.001) ***	-0.020 (0.003)***
Training	1 if the individual has done some training, 0 otherwise	-0.012 (0.000)	0.009 (0.010)	-0.095 (0.029)

*Note: ***: significant at 0.001, ** : significant at 0.01, *: significant at 0.05, . : significant at 0.1*

Outcome Equation

In quantifying the wage-risk trade-off, this paper supplements the analysis of the outcome equation with two different statistical models: Ordinary Least Square and Heckman's sample selection model. All variables are significant at a statistical level of 0.01 with the exceptions of certain dichotomous variables related to occupation, firm type, province, and occupational disability rate. The R-squared value for the OLS and Heckman's selection model ranges from 0.373 to 0.591; this level is consistent with existing VSL literature of the hedonic wage model.

Coefficients between OLS and Heckman do not differ significantly, as this methodology is generally used to account for the selection decision to enter the labor force. However, by having labor force participation as the dummy variable, significant wage-determinants like occupation, firm type or workers' compensation will not be included. Additionally, both unpaid and paid workers face occupational risk. Only processing the sample of paid workers can lead to biased estimates of the wage-risk trade-off.

After acknowledging the selection bias, there still exists the trend that women are paid less as shown in Table 7. It is interesting to note that the gender coefficient is greater when processed by Heckman than the OLS. This means that

the gender wage gap would widen had women in unpaid labor choose to be paid. The reason behind this is that before entering the labor market, women are expected to carry the burden of unpaid work, including unpaid domestic work. This denies women "a level playing field with men" that leads to a greater wage gap had they chosen to engage in paid labor. This is further exacerbated by lower education, lower mobility and overcrowding in low-productivity occupations (Hirway, 2015, p.10). This results in lower wages and higher unemployment rate. Additionally, women entrepreneurs tend to lack access to resources, credit, and technology.

Table 7: Outcome Equation Coefficient – Personal Characteristics

(The full results are displayed in Appendix E)

Independent Variables	**Coefficients (Standard Error)**					
	Employed		**Blue-collar worker**		**White-collar workers**	
	OLS	Heckman selection	OLS	Heckman selection	OLS	Heckman selection
rural_urban (1 if the individual lives in an urban setting, 0 otherwise)	0.085***	0.089***	0.066***	0.075***	0.116***	0.116***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)
Gender (1 if the individual is a female, 0 if male)	-0.327***	-0.337***	-0.374***	-0.395***	-0.213***	-0.214***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)
Experience (in years)	0.009***	0.009***	0.006***	0.005***	0.019***	0.019***
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0003)
Schooling (in years)	0.024***	0.023***	0.020***	0.019***	0.052***	0.052***
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.001)	(0.001)
Training (1 if the individual has completed formal training)	0.069***	0.069***	-0.003	-0.004	0.097***	0.096***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Tech (1 if the individual uses technology in their job)	0.178***	0.177***	0.180***	0.177***	0.169***	0.170***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)
Occupation Dummy Variable (1 if it represents the individual's occupation)						
Manager	0.348***	0.333***			0.292***	0.253***
	(0.008)	(0.008)			(0.008)	(0.009)
Military/ Police	0.365***	0.358***				
	(0.014)	(0.015)				
Processing/ Craft	-0.055***	-0.053***	-0.722***	-0.716***		
	(0.007)	(0.007)	(0.017)	(0.017)		
Professional	0.053***	0.058***			-0.040***	-0.040***
	(0.006)	(0.006)			(0.006)	(0.006)
Service Sales	0.014**	-0.0004	-0.655***	-0.672***		
	(0.006)	(0.006)	(0.017)	(0.017)		
Skilled Agriculture	-0.133***	-0.170***	-0.819***	-0.874***		
	(0.008)	(0.008)	(0.017)	(0.018)		
Technician	0.053***	0.052***			0.030***	0.035***
	(0.007)	(0.007)			(0.007)	(0.007)
Unskilled Worker	-0.072***	-0.061***	-0.760***	-0.739***		
	(0.006)	(0.006)	(0.017)	(0.017)		

*Note: ***: significant at 0.001, ** : significant at 0.01, *: significant at 0.05, . : significant at 0.1*

The coefficients of experience and schooling are positive, which aligns with existing literature on VSL and present conditions; education and working experience increases an individual's wage. This effect is more prominent in white-collar workers, where education and training are more essential. In blue-collar jobs, an additional year of work experience only increases the average monthly wage by 0.5%, as compared to 1.9% for white-collar jobs. Similarly, an additional year of education increases the average monthly wage of blue-collar workers by 1.9%, compared to 5.2% for white-collar workers.

Moreover, the use of technology in jobs increase the average wage by 18%. Consequently, the average monthly wage of white-collar jobs that requires more education and work experience like manager, professionals, and technicians are higher than the overall wage, with managers earning approximately 35% more. This contrasts greatly with the blue-collar job, skilled agricultural workers who earn on average 13.3% lesser than the overall average wage.

Table 8: Outcome Equation Coefficient – Union Affiliation and Workers' Compensation

Independent Variables	Coefficient (Standard Error)					
	Employed		Blue-collar worker		White-collar workers	
	OLS	Heckman selection	OLS	Heckman selection	OLS	Heckman selection
union	0.204***	0.206***	0.140***	0.142***	0.161***	0.161***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)
health_ins	0.339***	0.342***	0.177***	0.184***	0.495***	0.506***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.008)	(0.009)
workacc_ins	0.101***	0.102***	0.107***	0.107***	0.098***	0.103***
	(0.007)	(0.007)	(0.010)	(0.010)	(0.010)	(0.010)
life_ins	0.255***	0.253***	0.094***	0.091***	0.288***	0.284***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.009)	(0.009)

*Note: ***: significant at 0.001, ** : significant at 0.01, *: significant at 0.05, . : significant at 0.1*

Table 8 above shows the effect of union affiliation and workers' compensation towards wage earned. Being in a union increases the average monthly wage by 20%. The number 20% aligns with the range provided by existing literature. One of the main goals of unions is to increase the minimum wage through workers seeking collective bargaining (Walters & Mishel, 2003). In relation to workers' compensations like health, work accident or life insurances, the coefficients of these variables are positive. This means that the presence of these insurances increases the average monthly wage. On one hand, wage reflects not only the individual's capabilities, but also relative attractiveness of jobs (Kniesner & Leeth, 2010, p. 3). Intuitively, workers would accept a lower wage if they were compensated with various insurance and pension plans. On the other hand, more highly paid jobs are more likely to offer its workers insurance or pension plans, which leads to these coefficients being positive.

Table 9: Outcome Equation Coefficient – Occupational Risk Rate

Independent Variables	Coefficients (Standard Error)					
	Employed		Blue-collar worker		White-collar workers	
	OLS	Heckman selection	OLS	Heckman selection	OLS	Heckman selection
rate_nonfatal	-0.001***	-0.001***	-0.001***	-0.001***	0.0003**	0.0001
	(0.00005)	(0.00005)	(0.00005)	(0.0001)	(0.0001)	(0.0001)
rate_fatal	0.050***	0.053***	0.056***	0.060***	-0.085***	-0.092***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.011)	(0.011)
rate_disab	0.002*	0.002	-0.002	-0.003*	0.048***	0.049***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)

In relation to the fatal occupational risk shown in Table 9, all coefficients are statistically significant at 0.01 level for the employed and blue-collar sample. An additional incident of death per 10,000 workers increases the average wage by 5 – 6%. For the white-collar worker sample, the coefficient of the occupational fatal rate is negative; industries with a high fatality rate like construction pays its white-collar workers less as compared to other industries. After accounting for the selection bias, the coefficient increases; workers demand a higher wage premium for the same increase in risk level.

Value of Statistical Life

VSL is an estimate for society's willingness to pay for a chance to reduce one statistical death (Wang & He, 2010, p.1). In the hedonic wage model, the coefficient of the fatality risk variable represents the additional proportional effect of fatality risk towards wage. This coefficient is then multiplied by the average annual wage and risk increments of 10,000 workers as reflected in Equation 6.

Table 10: VSL Computation

Samples	Method	Coefficient for Occupational Fatality Rate (Standard Error)	Average Annual Wage (in Rupiah)	VSL Estimation	
				(in Rupiah)	(in US Dollars)
Employed	OLS	0.050 (0.004)	Rp 27,752,160	Rp. 13,867,080,000 (Rp. 1,110,086,400)	$ 957, 450 ($ 76, 596)
	Heckman	0.053 (0.004)		Rp 14,708,644,800 (Rp 1,110,086,400)	$ 1,015,555 ($ 76,596)
Blue-Collar	OLS	0.056 (0.005)	Rp 23,255,748	Rp 13,023,218,880 (Rp 1,162,787,400)	$ 899,186 ($ 80,232)
	Heckman	0.060 (0.005)		Rp 13,953,448,800 (Rp 1,162,787,400)	$ 963,413 ($ 80,232)

Table 10 reports the computations from Equation 6 and estimates Indonesia's VSL to be around $950,000. More emphasis is placed on the coefficients obtained through the Heckman's selection model and from the blue-collar sample. Although the obtained estimate is not far from existing estimates of Indonesia or similar ASEAN countries, it is considered high. In 2017, Viscusi and Masterman estimated the VSL of Indonesia to be $ 592,000 by using the VSL of 13 countries and adjusting for the income difference (Viscusi & Masterman, 2017, p. 246). However, VSL also depends on the country's demographics and thus, a comparison between Indonesia and a similar ASEAN country like the Philippines is more suitable.

In 2007, Rosalina Palanca-Tan estimated the VSL of children in Manila, Philippines to be around US $700,000 – 800,000 (Palanca-Tran, 2007, p.1). Indonesia's higher VSL estimate can be explained by two effect: the wealth effect and age effect. The wealth effect states that VSL estimates increase with the wealth of society (ibid.). Based on World Bank's 2019 Data, the GDP per capita of the Philippines is 75% of Indonesia's; based on the wealth effect, Indonesia would have a higher VSL. Moreover, Aldy and Viscusi found that the VSL reflects an inverted U-shaped relationship with age (Aldy & Viscusi, 2008, p. 573); the value peaks at adults between the age of 35 to 44. As this is the average age of Indonesia's working age population, the obtained estimate of Indonesia's VSL would be higher than US $800,000.

Appendix

Appendix A: Personal Characteristic Variables and Statistics

Variable	Definition	Mean (Standard Deviation)			
		Full Sample	Employed	Unpaid	Paid
Paid/ Unpaid Labour	1 if paid labour, 0 if unpaid family worker		0.64 (0.48)		
Monthly wage	In Rupiah		1,469,650 (2,186,811)		2,312,680 (2,361,283)
Rural/Urban	0 if rural, 1 if urban	0.44 (0.50)	0.42 (0.49)	0.27 (0.45)	0.50 (0.50)
Gender	0 if male, 1 if female	0.51 (0.50)	0.40 (0.49)	0.48 (0.50)	0.36 (0.48)
Age	In years	40.57 (16.45)	41.85 (13.81)	44.13 (14.70)	40.53 (13.09)
Marital	1 if married, 0 otherwise	0.67 (0.47)	0.75 (0.43)	0.80 (0.40)	0.72 (0.45)
Family	Number of family members	4.13 (1.72)	4.06 (1.70)	4.09 (1.70)	4.04 (1.70)
Family_5	Number of family members under the age of five	0.30 (0.55)	0.30 (0.55)	0.29 (0.55)	0.32 (0.56)
Schooling	In years	8.15 (4.79)	8.28 (4.96)	6.73 (4.70)	9.17 (4.88)
Training	1 if the individual has done some training	0.09 (0.29)	0.11 (0.31)	0.05 (0.23)	0.14 (0.34)
Disability1	1 if suffers from visual impairment	0.00 (0.06)	0.00 (0.03)	0.00 (0.03)	0.00 (0.03)
Disability2	1 if suffers from speech impediment	0.00 (0.06)	0.00 (0.04)	0.00 (0.04)	0.00 (0.03)
Disability3	1 if struggles in walking	0.04 (0.21)	0.02 (014)	0.03 (0.16)	0.02 (0.12)
Disability4	1 if struggles in holding	0.02 (0.14)	0.01 (0.08)	0.00 (0.10)	0.01 (0.08)
Disability5	1 if has other disabilities	0.02 (0.14)	0.00 (0.08)	0.00 (0.09)	0.00 (0.07)
Move	1 if has moved in the past 5 years	0.04 (0.20)	0.04 (0.20)	0.03 (0.17)	0.05 (0.21)
Full_time	1 if they work more than 35 hours a week		0.66 (0.47)	0.52 (0.50)	0.74 (0.43)
Working Experience	In years		10.36 (10.46)	12.50 (11.59)	9.14 (9.54)
Workh_w	Hours worked per week		39.79 (17.20)	35.40 (18.45)	42.30 (15.9)
Tech	1 if the job requires the use technology		0.32 (0.47)	0.18 (0.38)	0.41 (0.49)
Union	1 if the individual is a member of a union		0.06 (0.25)	0.00 (0.01)	0.10 (0.30)
Contract	1 if the individual signed a written contract before accepting the job		0.29 (0.45)	0.0001 (0.04)	0.46 (0.50)
Health_ins	1 if the individual has health insurance		0.15 (0.36)	0.0003 (0.016)	0.24 (0.43)
Workacc_ins	1 if the individual has accidental occupational insurance		0.14 (0.34)	0.0002 (0.016)	0.21 (0.41)
Life_ins	1 if the individual has life insurance		0.11 (0.31)	0.0002 (0.013)	0.17 (0.38)
Oldage_ins	1 if the individual has insurance for old age		0.09 (0.29)	0.0001 (0.011)	0.14 (0.35)
Pension	1 if the individual has a pension plan		0.08 (0.27)	0.0001 (0.010)	0.13 (0.33)
Paid_leave	1 if the individual has the right to paid leave		0.12 (0.32)	0.0002 (0.014)	0.18 (0.39)
Add_job	1 if the individual has an additional job		0.17 (0.38)	0.20 (0.40)	0.16 (0.36)
Add_jobh	Hours worked on the additional job per week		2.19 (5.67)	2.44 (5.71)	2.05 (5.64)

Appendix B: Industry-Level Reported Incidents in 2019

Industry	Recovered	In Treatment	Functional Disability	Anatomic Disability	Permanent Disability	Death	Total
(1) Agriculture & Fishery	10,526	6,768	413	405	10	339	18,461
(2) Construction	1,271	983	271	269	7	195	2,996
(3) Finance, Insurance, Real Estate	1,053	1,179	223	220		147	2,822
(4) Mining	607	764	261	228		106	1,966
(5) Manufacturing	39,645	20,518	745	759	8	696	62,371

(6) Trades, Restaurants and Accommodation	5,180	6,243	259	246		497	12,425
(7) Social Services	5,064	1,179	298	266		408	7,215
(8) Transportation and Communication	1,527	1,806	265	240	3	217	4,058
(9) Utilities	609	774	239	171	2	126	1,921
Total	65,482	40,214	2,974	2,804	30	2,731	114,235

Appendix C: Number of Workers who have Opted into the BPJS Program

Industry	Total
(1) Agriculture & Fishery	1,641,487
(2) Construction	329,008
(3) Finance, Insurance, Real Estate	1,300,619
(4) Mining	446,217
(5) Manufacturing	5,252,168
(6) Trades, Restaurants and Accommodation	4,208,522
(7) Social Services	5,158,805
(8) Transportation and Communication	812,530
(9) Utilities	480,436
Total	19,629,792

Appendix D: Selection Equation Result

Variable	Definition	All	Blue-collar	White-collar
Gender	0 if male, 1 if female	-0.272 (0.006) ***	-0.285 (0.006) ***	0.059 (0.027) ***
Rural_urban	0 if the individual lives in a rural setting, 1 if the individual lives in an urban setting	0.173 (0.005) ***	0.182 (0.006) ***	0.024 (0.024) ***
Age	In years	0.005 (0.000) ***	0.006 (0.000) ***	-0.008 (0.001) ***
Marital	1 if married, 0 otherwise	-0.247 (0.006) ***	-0.245 (0.006) ***	-0.242 (0.028) ***
Family	Number of family members	-0.063 (0.002) ***	-0.065 (0.002) ***	-0.023 (0.007) ***
Family_5	Number of family members under the age of five	0.191 (0.006) ***	0.201 (0.006) ***	0.003 (0.025) ***
Gender * Famlly_5	Interaction term between gender and the number of family members under the age of five	-0.132 (0.009) ***	-0.135 (0.009) ***	-0.091 (0.039) ***
Disability1	1 if suffers from visual impairment, 0 otherwise	-0.041 (0.067)	-0.039 (0.070)	-0.155 (0.266)
Disability2	1 if suffers from speech impediment, 0 otherwise	0.011 (0.057)	0.000 (0.058)	0.413 (0.339)
Disability3	1 if struggles in walking, 0 otherwise	-0.055 (0.016) ***	-0.056 (0.016) ***	-0.066 (0.086) ***
Disability4	1 if struggles in holding, 0 otherwise	0.013 (0.026)	0.010 (0.026)	0.054 (0.144)

Disability5	1 if has other disabilities, 0 otherwise	0.009 (0.028)	0.011 (0.028)	0.061 (0.180)
Experience	Working experience in years	-0.011 (0.000) ***	-0.011 (0.000) ***	-0.008 (0.001) ***
Schooling	Number of years in education	-0.011 (0.000) ***	-0.010 (0.001) ***	-0.020 (0.003)***
Training	1 if the individual has done some training, 0 otherwise	-0.012 (0.000)	0.009 (0.010)	-0.095 (0.029)
Workh_w	Number of hours worked per week	0.005 (0.000) ***	0.005 (0.000) ***	-0.001 (0.001) ***
Occupation: Manager	1 if the individual works as a manager, 0 otherwise	-1.057 (0.041) ***		-0.996 (0.041)
Occupation: Military/police	1 if the individual works in military/ police, 0 otherwise	0.246 (6.654)		
Occupation: Manufacturing	1 if the individual works in factory processing and craft, 0 otherwise	0.005 (0.039)	0.722 (6.658)	
Occupation: Professional	1 if the individual works as a professional, 0 otherwise	0.046 (0.046)		-0.012 (0.045)
Occupation: Service/Sales	1 if the individual works as service/sales, 0 otherwise	-0.548 (0.039) ***	0.224 (6.658)	
Occupation: Skilled Agriculture	1 if the individual works as a skilled agriculture worker, 0 otherwise	-0.735 (0.039) ***	-0.020 (6.658)	
Occupation: Technician	1 if the individual works as a technician, 0 otherwise	-0.179 (0.044) ***		-0.048 (0.044)
Occupation: Unskilled Worker	1 if the individual works as an unskilled worker, 0 otherwise	0.332 (0.039) ***	1.045 (6.658)	
Firm Type: For-profit	1 if the individual works in a for-profit firm, 0 otherwise	-1.234 (0.037) ***	-0.927 (0.043) ***	-0.853 (0.126) ***
Firm Type: Government	1 if the individual works for the government, 0 otherwise	-1.143 (0.054) ***	-0.848 (0.108)***	-0.486 (0.132) ***
Firm Type: Individual	1 if the individual is self-employed, 0 otherwise	-1.948 (0.031) ***	-1.990 (0.032) ***	-1.129 (0.120) ***
Firm Type: International	1 if the individual works in an international- based firm, 0 otherwise	-2.196 (0.163) ***	-2.196 (0.163) ***	-1.259 (0.233) ***
Firm Type: Co-operative	1 if the individual works in a co-operative, 0 otherwise	-1.637 (0.073) ***	-1.910 (0.092) ***	-0.564 (0.162) ***
Firm type: Non-profit	1 if the individual works in a non-profit organization, 0 otherwise	-1.480 (0.055) ***	-1.315 (0.092) ***	-0.848 (0.132) ***
Firm Type: Others	1 if the individual's firm is not categorized as above, 0 otherwise	-1.632 (0.045) ***	-1.644 (0.047) ***	-1.316 (0.168) ***
Tech	1 if the individual uses technology in their job, 0 otherwise	-0.086 (0.006) ***	-0.073 (0.007) ***	-0.166 (0.025) ***
Union	1 if the individual is a member of the union, 0 otherwise	0.505 (0.072) ***	1.007 (0.129)***	0.240 (0.085) ***
Contract	1 if the individual signed a written contract before offering the job, 0 otherwise	2.129 (0.021) ***	2.252 (0.025) ***	1.697 (0.044) ***
Full_time	1 if the individual works more than 35 hours, 0 otherwise	0.080 (0.008) ***	0.078 (0.008) ***	0.035 (0.037) ***
Add_job	1 if the individual is taking an additional side job, 0 otherwise	-0.010 (0.010)	-0.011 (0.010)	0.025 (0.045)
Add_jobh	Number of hours worked per week	0.002 (0.000) **	0.002 (0.001) **	-0.001 (0.002) **
Health_ins	1 if the individual has health insurance, 0 otherwise	1.108 (0.062) ***	1.214 (0.087) ***	1.040 (0.096) ***
Workacc_ins	1 if the individual has accidental occupational insurance, 0 otherwise	0.807 (0.076) ***	0.806 (0.094) ***	0.809 (0.137) ***

Life_ins	1 if the individual has life insurance, 0 otherwise	-0.557 (0.094) ***	-0.103 (0.153)	-0.450 (0.145)
Rate_nonfatal	Occupational non-fatal risk rate by industry per 10,000 workers	-0.005 (0.000) ***	-0.004 (0.000) ***	-0.003 (0.000)***
Rate_fatal	Occupational fatal risk rate by industry per 10,000 workers	0.049 (0.012) ***	0.063 (0.013) ***	-0.050 (0.037) ***
Rate_disab	Occupational disability rate by industry per 10,000 workers	0.004 (0.004)	0.010 (0..004) *	-0.017 (0.012) *

Appendix E: Outcome Equation Results

Dependent variable: natural logarithm of monthly wage

	Employed		Blue-collar worker		White-collar workers	
	OLS	Heckman selection	OLS	Heckman selection	OLS	Heckman selection
rural_urban	0.085***	0.089***	0.066***	0.075***	0.116***	0.116***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)
gender	-0.327***	-0.337***	-0.374***	-0.395***	-0.213***	-0.214***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)
experience	0.009***	0.009***	0.006***	0.005***	0.019***	0.019***
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0003)
schooling	0.024***	0.023***	0.020***	0.019***	0.052***	0.052***
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.001)	(0.001)
training	0.069***	0.069***	-0.003	-0.004	0.097***	0.096***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
workh_w	0.009***	0.009***	0.009***	0.009***	0.010***	0.010***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0003)	(0.0003)
occupationmanager	0.348***	0.333***			0.292***	0.253***
	(0.008)	(0.008)			(0.008)	(0.009)
occupationmilitary/ police	0.365***	0.358***				
	(0.014)	(0.015)				
occupationprocessing/craft	-0.055***	-0.053***	-0.722***	-0.716***		
	(0.007)	(0.007)	(0.017)	(0.017)		
occupationprofessional	0.053***	0.058***			-0.040***	-0.040***
	(0.006)	(0.006)			(0.006)	(0.006)
occupationservice/sales	0.014**	-0.0004	-0.655***	-0.672***		
	(0.006)	(0.006)	(0.017)	(0.017)		
occupationskilled agriculture	-0.133***	-0.170***	-0.819***	-0.874***		
	(0.008)	(0.008)	(0.017)	(0.018)		
occupationtechnician	0.053***	0.052***			0.030***	0.035***
	(0.007)	(0.007)			(0.007)	(0.007)
occupationunskilled worker	-0.072***	-0.061***	-0.760***	-0.739***		
	(0.006)	(0.006)	(0.017)	(0.017)		
firm_typefor-profit	0.098***	0.077***	0.265***	0.231***	-0.055	-0.090**
	(0.007)	(0.007)	(0.008)	(0.008)	(0.042)	(0.042)
firm_typegovernment	-0.125***	-0.145***	-0.102***	-0.140***	-0.217***	-0.258***
	(0.008)	(0.008)	(0.011)	(0.011)	(0.042)	(0.042)
firm_typeindividual	0.061***	0.025***	0.048***	-0.011*	0.213***	0.108***
	(0.006)	(0.007)	(0.006)	(0.007)	(0.041)	(0.042)
firm_typeinternational	0.012	-0.012	0.200***	0.156***	-0.096*	-0.141**
	(0.034)	(0.035)	(0.055)	(0.055)	(0.058)	(0.058)
firm_typekoperasi	-0.008	-0.027	0.068**	0.030	-0.062	-0.097**
	(0.020)	(0.020)	(0.033)	(0.033)	(0.046)	(0.046)
firm_typenon-profit	-0.334***	-0.353***	-0.154***	-0.187***	-0.384***	-0.426***
	(0.011)	(0.011)	(0.020)	(0.020)	(0.042)	(0.042)

firm_typeothers	-0.020	-0.042**	-0.012	-0.048***	-0.071	-0.138**
	(0.017)	(0.017)	(0.018)	(0.018)	(0.061)	(0.061)
tech	0.178***	0.177***	0.180***	0.177***	0.169***	0.170***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)
union	0.204***	0.206***	0.140***	0.142***	0.161***	0.161***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.006)	(0.006)
contract	-0.046***	-0.008*	-0.027***	0.033***	-0.047***	0.028**
	(0.003)	(0.004)	(0.003)	(0.005)	(0.010)	(0.011)
full_time	0.202***	0.207***	0.208***	0.218***	0.108***	0.110***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.008)	(0.008)
provinceBALI	0.124***	0.118***	0.084***	0.072***	0.247***	0.250***
	(0.010)	(0.010)	(0.011)	(0.011)	(0.018)	(0.018)
provinceBANTEN	0.263***	0.260***	0.219***	0.213***	0.411***	0.412***
	(0.010)	(0.010)	(0.011)	(0.011)	(0.018)	(0.018)
provinceBENGKULU	-0.054***	-0.061***	-0.102***	-0.116***	0.064***	0.066***
	(0.011)	(0.011)	(0.013)	(0.013)	(0.020)	(0.020)
provinceDI YOGYAKARTA	-0.203***	-0.208***	-0.257***	-0.267***	-0.017	-0.010
	(0.012)	(0.012)	(0.014)	(0.014)	(0.022)	(0.022)
provinceDKI JAKARTA	0.410***	0.412***	0.356***	0.358***	0.573***	0.585***
	(0.010)	(0.010)	(0.012)	(0.012)	(0.018)	(0.018)
provinceGORONTALO	-0.046***	-0.050***	-0.087***	-0.095***	0.056**	0.054**
	(0.013)	(0.013)	(0.015)	(0.015)	(0.023)	(0.023)
provinceJAMBI	0.133***	0.137***	0.141***	0.148***	0.059***	0.062***
	(0.010)	(0.010)	(0.011)	(0.011)	(0.020)	(0.020)
provinceJAWA BARAT	0.053***	0.049***	0.006	-0.003	0.223***	0.226***
	(0.007)	(0.007)	(0.009)	(0.009)	(0.014)	(0.014)
provinceJAWA TENGAH	-0.106***	-0.109***	-0.129***	-0.137***	-0.010	-0.007
	(0.007)	(0.007)	(0.008)	(0.008)	(0.014)	(0.014)
provinceJAWA TIMUR	-0.063***	-0.069***	-0.086***	-0.098***	-0.008	-0.007
	(0.007)	(0.007)	(0.008)	(0.008)	(0.014)	(0.014)
provinceKALIMANTAN BARAT	0.129***	0.130***	0.102***	0.103***	0.160***	0.164***
	(0.009)	(0.009)	(0.011)	(0.011)	(0.019)	(0.019)
provinceKALIMANTAN SELATAN	0.101***	0.099***	0.088***	0.083***	0.121***	0.124***
	(0.010)	(0.010)	(0.011)	(0.011)	(0.018)	(0.018)
provinceKALIMANTAN TENGAH	0.234***	0.233***	0.232***	0.231***	0.227***	0.229***
	(0.010)	(0.010)	(0.011)	(0.011)	(0.018)	(0.018)
provinceKALIMANTAN TIMUR	0.265***	0.260***	0.253***	0.244***	0.337***	0.336***
	(0.010)	(0.010)	(0.012)	(0.012)	(0.018)	(0.018)
provinceKALIMANTAN UTARA	0.307***	0.303***	0.253***	0.245***	0.452***	0.455***
	(0.015)	(0.015)	(0.018)	(0.018)	(0.024)	(0.024)
provinceKEPULAUAN BANGKA BELITUNG	0.315***	0.317***	0.300***	0.302***	0.368***	0.367***
	(0.012)	(0.012)	(0.013)	(0.013)	(0.025)	(0.025)
provinceKEPULAUAN RIAU	0.240***	0.247***	0.225***	0.239***	0.317***	0.322***
	(0.012)	(0.012)	(0.014)	(0.014)	(0.020)	(0.020)
provinceLAMPUNG	-0.044***	-0.047***	-0.081***	-0.089***	0.027	0.030
	(0.009)	(0.009)	(0.010)	(0.010)	(0.019)	(0.019)
provinceMALUKU	-0.037***	-0.040***	-0.083***	-0.090***	0.081***	0.083***
	(0.011)	(0.011)	(0.013)	(0.013)	(0.018)	(0.019)
provinceMALUKU UTARA	0.051***	0.046***	0.031**	0.022	0.138***	0.137***
	(0.012)	(0.012)	(0.014)	(0.014)	(0.020)	(0.020)
provinceNUSA TENGGARA BARAT	-0.143***	-0.154***	-0.149***	-0.171***	-0.134***	-0.136***
	(0.010)	(0.010)	(0.012)	(0.012)	(0.019)	(0.019)
provinceNUSA TENGGARA TIMUR	-0.266***	-0.281***	-0.360***	-0.394***	-0.016	-0.015
	(0.009)	(0.009)	(0.011)	(0.011)	(0.016)	(0.016)
provincePAPUA	0.405***	0.389***	0.416***	0.383***	0.446***	0.447***

	(0.010)	(0.010)	(0.012)	(0.012)	(0.017)	(0.017)
provincePAPUA BARAT	0.297***	0.289***	0.292***	0.273***	0.384***	0.386***
	(0.012)	(0.012)	(0.015)	(0.015)	(0.018)	(0.018)
provinceRIAU	0.165***	0.168***	0.164***	0.170***	0.189***	0.192***
	(0.009)	(0.009)	(0.011)	(0.011)	(0.018)	(0.018)
provinceSULAWESI BARAT	-0.209***	-0.216***	-0.220***	-0.235***	-0.143***	-0.144***
	(0.014)	(0.014)	(0.016)	(0.016)	(0.025)	(0.025)
provinceSULAWESI SELATAN	-0.022***	-0.026***	-0.010	-0.020**	-0.061***	-0.058***
	(0.008)	(0.008)	(0.010)	(0.010)	(0.015)	(0.015)
provinceSULAWESI TENGAH	-0.057***	-0.060***	-0.090***	-0.096***	0.047***	0.049***
	(0.010)	(0.010)	(0.012)	(0.012)	(0.018)	(0.018)
provinceSULAWESI TENGGARA	-0.034***	-0.045***	-0.037***	-0.062***	-0.015	-0.015
	(0.010)	(0.010)	(0.013)	(0.013)	(0.018)	(0.018)
provinceSULAWESI UTARA	0.195***	0.202***	0.164***	0.178***	0.290***	0.292***
	(0.009)	(0.009)	(0.011)	(0.011)	(0.017)	(0.017)
provinceSUMATERA BARAT	0.038***	0.036***	0.025**	0.019*	0.072***	0.072***
	(0.009)	(0.009)	(0.010)	(0.010)	(0.016)	(0.016)
provinceSUMATERA SELATAN	-0.016*	-0.018**	-0.022**	-0.027***	-0.039**	-0.037**
	(0.009)	(0.009)	(0.010)	(0.010)	(0.018)	(0.018)
provinceSUMATERA UTARA	-0.031***	-0.036***	-0.054***	-0.067***	0.063***	0.066***
	(0.008)	(0.008)	(0.009)	(0.009)	(0.014)	(0.014)
add_job	-0.059***	-0.060***	-0.058***	-0.059***	-0.049***	-0.048***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.010)	(0.010)
add_jobh	0.001***	0.001***	0.002***	0.002***	-0.001	-0.001
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.001)	(0.001)
health_ins	0.339***	0.342***	0.177***	0.184***	0.495***	0.506***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.008)	(0.009)
workacc_ins	0.101***	0.102***	0.107***	0.107***	0.098***	0.103***
	(0.007)	(0.007)	(0.010)	(0.010)	(0.010)	(0.010)
life_ins	0.255***	0.253***	0.094***	0.091***	0.288***	0.284***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.009)	(0.009)
rate_nonfatal	-0.001***	-0.001***	-0.001***	-0.001***	0.0003**	0.0001
	(0.00005)	(0.00005)	(0.00005)	(0.0001)	(0.0001)	(0.0001)
rate_fatal	0.050***	0.053***	0.056***	0.060***	-0.085***	-0.092***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.011)	(0.011)
rate_disab	0.002*	0.002	-0.002	-0.003*	0.048***	0.049***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)
Constant	13.211***	13.199***	14.024***	14.004***	12.659***	12.636***
	(0.012)	(0.012)	(0.020)	(0.020)	(0.044)	(0.044)
Observations	328,411	516,797	252,061	433,343	76,350	83,454
R2	0.453	0.453	0.373	0.374	0.591	0.592
Adjusted R2	0.452	0.453	0.373	0.374	0.591	0.592
rho		0.139		0.220		0.421
Inverse Mills Ratio		0.093*** (0.007)		0.148*** (0.007)		0.265*** (0.022)
Residual Std. Error	0.667 (df = 328344)		0.666 (df = 251998)		0.626 (df = 76288)	
F Statistic		4,113.209*** (df = 66; 328344)		2,421.763*** (df = 62; 251998)		1,808.932*** (df = 61; 76288)
Note:					*p<0.1; **p<0.05; ***p<0.01	

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