From School to Work: Does Vocational Education Improve Labour Market Outcomes? An Empirical Analysis of Indonesia

Dyah Pritadrajati

Contents

From School to Work: Does Vocational Education Improve Labour Market Outcomes? An Empirical Analysis of Indonesia[+]

by

Dyah Pritadrajati[*]

October 2018

Abstract

While vocational education is believed to provide students with the opportunity to learn specific-job relevant, empirical evidence on the impact of vocational education on labour market outcomes is far from conclusive. In order to reduce youth unemployment rate, the Indonesian government plans to increase the proportion of vocational schools in upper-secondary education, from 42 per cent today to 70 per cent by 2025. Using a rich longitudinal household survey for Indonesia, this paper analyses the effects of different school types on four labour market outcomes: labour force participation, risk of unemployment, job formality, and income. To correct for endogeneity bias, this paper uses multiple instrumental variables, including parents' educational backgrounds and the proportion of each school type in the district to reflect the supply of each school type. The results suggest that public vocational education provides better prospects of labour outcomes for women, relative to public general schools. However, no such difference is found for men. Moreover, the results suggest that many vocational schools, especially private ones, perform poorly in terms of their graduate's job formality and income. For vocational education to truly improve labour market prospects for youth, greater attention needs to be paid to quality assurance as well as change in hiring practice.

Keywords: vocational education, general education, upper-secondary school, labour market outcomes.

I.   Introduction

Extending the access to vocational education is often an appealing option for policymakers in developing countries, especially in order to raise employment. Vocational education is believed to produce 'specific human capital' which provides students with the opportunity to learn specific job-relevant skills that can make them more readily suitable for a given job and would make them more productive (Tilak, 2002). However, hiring practice in reality is still far from favouring graduates of vocational institutions. For instance, in Niger, due to rigid and high government wage standards for graduates of vocational and technical institutions, employers still prefer to hire graduates of general education and regard on-the-job training for them as a less costly investment (Mingat and others, 1989). Moreover, some countries have also failed in implementing the vocational education expansion policy. The effort to increase the number of skilled workers in Tanzania by prioritising vocational education in the late 1960s did not yield the expected result as the enrolment rate in the vocational education was considerably low, primarily because parents continue to prefer general to vocational education (Kahyarara and Teal, 2008).

Government-sponsored pre-employment vocational education and training programs have been especially controversial. Nevertheless, despite the ongoing debates, the Indonesian Ministry of National Education and Culture (MNEC) is still enthusiastically embracing the idea of increasing the number of vocational schools. According to the Strategic Plan Year 2005-2009 of the MNEC, as an effort to address the problem of young unemployment, the government introduced revitalisation programmes for vocational schools (*Sekolah Menengah Kejuruan*, or SMK). These include proposals to increase the proportion of SMK and general schools (Sekolah Menengah Atas, or SMA) to 50%:50% in 2015, 60%:40% in 2020, and 70%:30% in 2025 (MNEC, 2007). Moreover, in an attempt to increase the number of vocational schools, constructions of new general schools were halted, while new vocational schools were built and some already established general schools were being converted into vocational schools. From 2009 to 2014, approximately 3,000 new SMK were built. In early 2017, the number of SMK in Indonesia reached 13,236 schools (3,434 were public and 9,802 were private) (MNEC, 2017).

In response to the current government policy on the expansion program of vocational education in Indonesia, this paper attempts to review the effects of the type of upper-secondary school on student's odds of participating in the labour force, being in employment, working in the formal sector, and on their incomes. The question posed is whether vocational education is beneficial for economic development and whether or not the government should invest further in vocational education. The primary data source for this study is Indonesia Family Life Survey (IFLS), a rich longitudinal household survey representing 83 per cent of the Indonesian population living in 13 of the country's 26 provinces, which contains retrospective information for all levels of school attendance and a set of control variables to consider non-random selection more carefully. To estimate the effects of the type of upper-secondary school on labour market outcomes, this paper uses probit to model dichotomous outcome variables and multivariate linear regression to model continuous dependent variable. Instrumental variable estimations are also undertaken to correct for endogeneity bias. Multiple instrumental variables including parents' educational backgrounds, proportion of each school type in the district to reflect the supply of each school type, and other individual characteristics that are not directly correlated with labour outcomes are used.

Empirical evidence on the benefit of vocational education is far from conclusive. There is still substantial heterogeneity in the estimated effect of vocational study on labour outcomes. Previous research also yielded mixed findings as to whether or not the government should invest further in vocational education. Therefore, this paper makes two main contributions to advance the discussions in the literature. First, it considers the problem of selection bias and endogeneity more carefully by applying instrumental variables to correct for the possible downward bias on labour outcomes among vocational school graduates. Second, it uses a rich longitudinal household survey from IFLS, covering 14 years, to estimate the effects of the type of upper-secondary schools on labour outcomes and the heterogeneity effect of school type, by age and academic ability, for both men and women.

The rest of this paper is structured as follows. The next two sections discuss findings in the previous studies and the background of the Indonesian education system as well as labour market condition. Subsequently, Section 4 describes the data used in this paper and Section 5 provides an analysis of the effects of school type on labour market outcomes as well as the heterogeneity effect of school type, by age and academic ability. Section 6, finally, provides a conclusion and policy recommendation.

II.   Literature Review

For fast-growing developing countries, the significance of middle-level skills -- those that have more education and training than an upper-secondary school diploma but less than a four-year college degree -- is widely recognised. However, there is no consensus on whether training should be provided before or after employment and on the extent to which it should be financed from public revenues and provided by government-sponsored institutions. Besides, developing countries in particular face two significant challenges: improving productivity under severe resource constraint and responding to demands for public education and training resources by improving access to and quality of primary education (Middleton, 1993). The argument in support of general education is on the basis that it creates 'general human capital' which may carry the advantage of flexibility and transferability over one's life and from one job to another, and to some extent from one country to another. Meanwhile, the supporters of vocational education argue that instilling technological knowledge based on what happened during the British industrial revolution, followed up by Germany and Japan is a fact that economic progress heavily depends on technical know-how (Psacharopoulos, 1997).

Several empirical studies (Brunello and Checchi, 2007; Hanushek, 2006; Shavit and Muller, 2000) have argued that students who enrol in vocational education have lower opportunity to pursue higher education in colleges or universities, thereby reducing the chance of gaining entry to the profession and other high-prestige employments. Vocational education is also considered to be less selective, less competitive, and less prestigious compared to other upper-secondary school tracks. This could entail a certain degree of negative presumption which may lead to discrimination when candidates compete for limited access to higher education (Chen, 2009). Also, vocational schooling may hinder the future socioeconomic attainment by restricting further education attainment in the following ways:

1.   Vocational education offers a restrictive curriculum with less emphasis on advanced courses in mathematics and science (Gamoran, 1987; Oakes, 1985), and consequently results in a lower level of achievement and are less likely to do well on the standardised test for selection into higher education;

2. Students at vocational schools are less exposed to highly motivated and academically successful peers which could affect their achievements negatively (Coleman and others, 1966; Hallinan and Williams, 1990);
3. The society's stigma toward vocational school signals to students that they are less merit worthy and, in turn, restrains their expectations and aspirations for the future (Shavit and Williams, 1985, Vanfossen and others, 1987);
4. Vocational schools devote less classroom time to core cognitive skills (i.e. mathematics and science) and the instruction provided is less intensive compared to general schools (Metz, 1978);
5. The teachers employed at vocational schools are relatively less experienced and competent (Finley, 1984).

There are also strong counter-arguments in favour of vocational education. Neuman and Ziderman (1999) find that -- based on Israeli census data -- vocational school graduates receive higher wages, relative to the counterparts who attended academic secondary schools, but only if they worked in occupations related to the vocational course of study they pursued. Specifically, they find that vocational education graduates employed in occupations related to their training enjoyed wage premiums of up to 9.5 per cent. Moreover, a study by Brunello & Rocco (2015) finds that vocational education graduates, for both genders, earn a wage premium in the US (ranges between 16 and 23 per cent) and in Canada (ranges between 5.9 and 8.3 per cent). Arum and Shavit (1995) also argue that vocational education is a safety net that reduces the risk of falling to the bottom of the labour queue, especially when students are unlikely to continue to college.

Aside from labour market outcomes, there are other concerns regarding the expansion of vocational education, including socioeconomic as well as flexibility and adaptability problems. Vanfossen and others (1987) observe that the chance of going to a vocational track education is 10 per cent for the higher socioeconomic status and 30 per cent for the lower socioeconomic status. Therefore, it is argued that school tracking actively produces inequality, mainly as vocational schools generally attract students from lower socioeconomic status whose chances of going to college and of entering high-prestige occupations are already quite low. Besides, Middleton and Ziderman (1997) argue that the skills of reading and writing, calculation, and problem-solving developed directly or indirectly by general education are essential to productivity in all forms and at all levels of employment. General education contributes significantly to a society's ability to remain flexible and adapt to rapid social, economic, and technological change, which may also alter the job requirements. Therefore, specialisation should not come too early in life, and general education should be promoted to develop learning capacities.

In the context of Indonesia, research conducted by Chen (2009) suggests that vocational schools do not provide advantages or disadvantages concerning employment opportunity and that attending vocational schools is significantly correlated with low academic achievement, which lowers the likelihood of entering university. Besides, research by Newhouse and Suryadarma (2011) states that the type of school strongly influences labour market outcomes. Overall, neither of these findings support the government's efforts to expand vocational schools.

III.   Indonesian Context

A.   Education system

In Indonesia, after completing nine years of primary education (six years of primary school and three years of junior secondary school), students may continue their education to upper-secondary education. The country has two different school systems, the Islamic and non-Islamic (secular) school systems, and this paper will focus exclusively on the non-Islamic (secular) school system. Students entering non-Islamic upper-secondary school can attend either a general school (*Sekolah Menengah Atas*, or SMA) or a vocational school (*Sekolah Menengah Kejuruan*, or SMK). There are distinct differences between these school types, and only a small portion of the curriculum used by these school types overlap, in most cases with regard to subjects such as English and Bahasa Indonesia (Newhouse & Suryadarma, 2011).

Figure 1. Enrolment in upper-secondary vocational
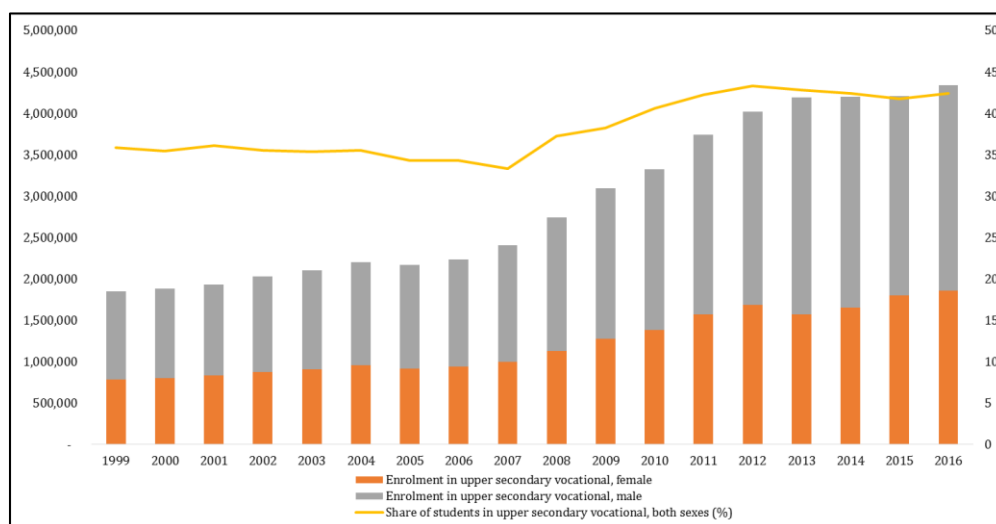
Source: Calculated based on data from the World Bank Education Statistics (2018).

General school students are prepared to continue their education in college, while the vocational students are prepared to enter the workforce. Therefore, both schools have different curriculum and learning methods according to the fundamental objectives of each type of schools. At the general school, the curriculum is comprised of basic competencies (religion, civics, Bahasa Indonesia, mathematics, history, and English) and interest-based subjects which define students' specialisations (natural science, social science, and language). Meanwhile, in addition to basic competencies, the vocational school offers vocational subjects which focus on technical skills and usually concentrate on just one or two programmes. In regard to the learning methods, general school commonly applies face-to-face classroom interaction and laboratory practice in schools. Meanwhile, vocational schools allow students to do internships in business enterprises as a complementary to the conventional learning methods.

As an effort to address the problem of young unemployment, the government introduced revitalisation programmes for SMK which includes the proposals to increase the proportion of SMK and SMA to 50%:50% in 2015, 60%:40% in 2020, and 70%:30% in 2025 (MNEC, 2007). Figure 1 shows the trend of the number of students enrolled in vocational schools as well as

their proportion to general schools. Overall, there is an increase in the number of students enrolled in vocational schools, particularly between 2007 and 2011. By 2016, there were 4 million students in vocational schools, nearly double from that in 2007. Despite missing the original government target of 50 per cent in 2015, the proportion of vocational schools to general schools in 2016 reached around 42.7 per cent.

B.   Labour market condition

According to the International Labour Organization (ILO) report in 2017, the unemployment rate continued to decline to 5.3 per cent from 11.2 per cent in 2015. However, this relatively low unemployment rate does not reflect the challenges faced by the economy in creating sufficient and decent employment opportunities. One of the labour market challenges is the high level of unemployment among young people age 15-24 years old. The youth unemployment in Indonesia increases from 18.9 per cent in 2016 to 19.4 in 2017, and is relatively high compared to the average number in the region -- Southeast Asia's youth unemployment rate is at 13.1 per cent. Furthermore, the youth unemployment rate in Indonesia is 5.8 times higher than the adult unemployment rate. This youth-to-adult unemployment ratio is higher than the average ratio in Southeast Asia, which stands at 5.1 (ILO, 2017).

The prevalence of informality and vulnerable employment also presents ongoing labour market challenges in Indonesia. Based on current global estimates, informal employment as a percentage of employment in the non-agricultural sector is estimated at 72.5 per cent (ILO, 2017). This figure is higher than China and Thailand. The level of informality in Indonesia is comparable to India and Pakistan -- countries with the highest level of estimated informality globally. Given the prevalence of informality, vulnerable employment (the number of unpaid family workers) of the total number of workers is also very high. In addition, women also tend to get lower wages than men; according to data from the National Employment Survey (Sakernas) on the labour force in 2016, the average female earns 78 per cent compared to male co-workers. The participation rate of female workers is at 52.1 per cent which remained lower than that of male workers at 83.4 per cent.

IV.   Data Characteristics

The Indonesia Family Life Survey (IFLS), a rich continuing longitudinal socioeconomic survey, provides a unique opportunity to explore the effect of school type on labour outcomes. The primary data sources for this study are IFLS wave 3, 4, and 5 which were fielded in 2000, 2007, and 2014, respectively. In order to answer the research question, not all observations from all three waves were used; instead, the sample is selected using several criteria. First, the author began with individuals who have completed upper-secondary school. Next, to be able to obtain information about employment, individuals who did not provide answers to interview questions after they graduated from upper-secondary school are dropped. Moreover, individuals who were currently enrolled in school or university when interviewed are not included in the analysis.

After dropping observations that did not meet the criteria mentioned above, the final sample consists of 6047 labour market observations for men and 6023 observations for women. These individuals were then grouped into three cohorts. Those who were born from 1947 to 1969 are categorised in the old cohort, those who were born from 1970 to 1979 are categorised in the middle cohort, and those who were born from 1980 to 1987 are categorised in the young cohort.

The IFLS collected information on national final examination at primary school, junior secondary school, and upper-secondary school for the middle and young cohort. Therefore, for these two recent cohorts, a direct measure of academic ability using the score of national final examination is available.

The dependent variables are the four different labour outcomes, including labour force participation, employment, job formality, and income. Information on labour outcomes is obtained from one's primary job which consumes the most time of working hours. The definition of labour force participation, employment, and formality in this paper are in accordance to that used by the Central Bureau of Statistics or Badan Pusat Statistik (BPS). Labour force participation is defined as individuals who have jobs, are actively looking for jobs, or are temporarily not working or unemployed. Meanwhile, employment is specified as those who work, try to work, or help to earn income for pay for at least one hour during the past weeks. Concerning formality, Table 1 summarises the classification between formal and informal employment. This paper uses income per month, instead of per hour, as there is no direct question providing information on this type of income in the IFLS survey. Although the author may calculate the amount of hourly income by using the information on the total number of working hours per week, it may lead to bias caused by measurement error. The attempt to calculate hourly income could get more complicated, especially among those who work in the informal sector and experience difficulties in measuring the amount of income or working hours.

Table 1. Classification between formal and informal employment

Work category	Industry	
	Agriculture	**Non-agriculture**
Unpaid family workers	Informal	Informal
Self-employed	Informal	Informal
Self-employed with unpaid family worker/temporary worker	Informal	Formal
Self-employed with permanent worker	Formal	Formal
Government worker	Formal	Formal
Private worker	Formal	Formal
Casual worker	Informal	Informal

Source: The table is based on BPS definition in Indonesia Labour Market Reports (World Bank, 2010).

Among the explanatory variables used to explain labour outcomes, the variable of interest in this paper is the type of upper-secondary school, which includes: public general, public vocational, private general, and private vocational. In addition, IFLS collects a rich set of information on socioeconomic which enables the author to use a set of explanatory variables to control for non-random selection more carefully. This is very crucial because inability to control for unobserved determinants of school choice and labour outcomes may confound the estimates through spurious correlations to outcomes. The explanatory variables include personal characteristics (gender, age, location of residence, marriage status, university attendance, and examination scores), parents' educational background, and community characteristics.

V. The Effect of School Type on Labour Outcome

A. Empirical approach

Analysis of labour market outcomes is prone to sample selection problem as the observed sample based on school choice is non-random, and failure to consider this problem may lead to biased and inconsistent estimates of the parameters of interest. Determination of labour outcomes generally causes a high correlation between the non-observable characteristics affecting labour outcomes and those that simultaneously determine the school choice in which the individuals attended. For example, this could be as a result of parents' decision or entrance selection criteria implemented by some schools. Also, differences in the type of school selected can indicate students' abilities in which those with higher ability will be more likely to attend public general schools. In addition to selection bias due to school choice, there is also another potential bias coming from non-random selection into labour force participation and employment, which then may affect the estimates of school type on job formality and income. For example, ability may be correlated with the likelihood of each type of school graduates chooses to work. Therefore, this paper controls as many pre-determined or exogenous characteristics as possible. Analogous to the randomised trial study by Attanasio and others (2011) on vocational training subsidies in Columbia, including pre-treatment characteristics increases the precision of the estimates and helps control for any remaining baseline imbalances. The author also attempts instrumental variable analysis to correct for endogeneity bias, which may lead to the downward bias on labour outcomes among vocational school graduates.

In order to analyse the effects of different school types on labour market outcomes, this study uses probit to estimate the conditional probability of a binary outcome and multivariate linear regression to model continuous dependent variable. The probit and linear regression estimations are estimated as follows:

$$labour\_outcome_{i,t} = \beta_0 + \beta_1 schl\_choice_{i,t} + X'_{i,t}\gamma_1 + X'_{h,t}\gamma_2 + X'_{j,t}\gamma_3 + \alpha_j + \delta_t + \varepsilon_{i,t}$$

The dependent variable $labour\_outcome_{i,t}$ consists of four different labour outcomes. The first three variables -- labour force participation, employment, and job formality -- are dummy variables which take the value of 1 if an individual i participates in the labour force, has an employment, and works at the formal sector, and 0 if otherwise. The fourth labour outcomes, monthly income, is a continuous dependent variable. The variable of interest is $schl\_choice_{i,t}$ of individual i at time t. $X'_{i,t}$; $X'_{h,t}$; $X'_{j,t}$ are vectors of individual-, household-, and province-specific control variables respectively. In addition, α_j is the provincial fixed effect, whereas δ_t is the time dummy used to capture structural change over time. Regarding diagnostic checking, for probit regression, the author examines for model sensitivity and specificity, as well as for outliers and influential observations. Meanwhile, for the multivariate linear regression, diagnostic checking involves a test for linearity, normality, homoscedasticity, multicollinearity, independence, model specification, and influential observations.

B.   Estimation results

Table 2 provides a summary of how different types of schools, relative to public general schools, affects labour outcomes.

Table 2. The effect of school types on labour outcome, male and female

School choice	Marginal effect (at the mean)							
	Male				Female			
	LFP	Employment	Formal	Income	LFP	Employment	Formal	Income
	Probit	Probit	Probit	OLS	Probit	Probit	Probit	OLS
Public Vocational	0.007	0.013	0.003	-0.020	0.034*	0.042**	0.050**	0.056
	(0.008)	(0.010)	(0.019)	(0.051)	(0.018)	(0.019)	(0.022)	(0.076)
Private General	0.008	0.007	-0.044***	-0.206***	-0.026*	-0.023	-0.018	-0.078
	(0.007)	(0.009)	(0.015)	(0.042)	(0.015)	(0.015)	(0.019)	(0.067)
Private Vocational	0.013*	0.006	-0.017	-0.137***	0.026	0.0248	-0.007	-0.129*
	(0.007)	(0.009)	(0.016)	(0.046)	(0.016)	(0.017)	(0.020)	(0.069)
Observations	5997	6047	5481	5104	6023	6023	3685	3087
Pseudo R^2	0.21	0.24	0.069	0.3818	0.09	0.07	0.11	0.2675

Notes: *** Indicates 1% significance, ** indicates 5% significance, and * indicates 10% significance; and standard errors robust to heteroscedasticity are in parentheses. Public General acts as baseline among the four school types. Results are presented for selected variables, as school choice is the main interest of this study.

Among males, there is no significant difference in the four labour market outcomes between those graduated from public vocational schools and public general schools. Students graduated from private general schools are the most disadvantaged groups, followed by those graduated from private vocational schools. In regard to the likelihood of job formality, those who attended private general schools have the least probability to work at formal sectors relative to the other three school types, which accounts for 4.4 percentage points lower. Also, those graduated from private general and private vocational receive significantly lower wage than those from public general schools, on average 20.6 per cent and 13.7 per cent, respectively. Therefore, for men, the success of graduates is more dependent on whether they graduate from public or private schools than whether they are studying in general or vocational schools.

Females who attended public vocational schools, on the other hand, have about 3.4 percentage points higher probability of being in the labour force, while those who attended private general schools have 2.6 percentage points lower probability. Moreover, those graduated from public vocational schools have 4.2 percentage points higher probability of employment and 5.0 percentage points higher probability to work in formal sectors, significant at 5 per cent level. Nevertheless, women who graduated from private vocational education programs receive about 12.9 per cent wage penalty. Hence, in general, enrolling in public vocational schools provide better prospects of labour outcomes for women.

1. Robustness to test scores

Table 3. The effect of school types on labour outcomes, with and without test scores

	Marginal effect (at the mean)							
School choice	**With Test Scores**				**Without Test Scores**			
	LFP	**Employment**	**Formal**	**Income**	**LFP**	**Employment**	**Formal**	**Income**
	Probit	**Probit**	**Probit**	**OLS**	**Probit**	**Probit**	**Probit**	**OLS**
Public Vocational	0.030	0.040	-0.003	-0.055	0.030	0.040	-0.006	-0.054
	(0.028)	(0.032)	(0.039)	(0.126)	(0.029)	(0.032)	(0.039)	(0.127)
Private General	-0.027	-0.014	-0.062*	-0.098	-0.027	-0.014	-0.055*	-0.152
	(0.025)	(0.028)	(0.033)	(0.117)	(0.024)	(0.027)	(0.033)	(0.117)
Private Vocational	0.049*	0.034	-0.075**	-0.11	0.049**	0.033	-0.063*	-0.170
	(0.026)	(0.028)	(0.033)	(0.113)	(0.025)	(0.027)	(0.033)	(0.113)
Observations	1875	1875	1312	1124	1875	1875	1312	1124
Pseudo R^2	0.15	0.11	0.11	0.40	0.15	0.11	0.11	0.40

Notes: *** Indicates 1% significance, ** indicates 5% significance, and * indicates 10% significance; and standard errors robust to heteroscedasticity are in parentheses. Public General acts as baseline among the four school types. Results are presented for selected variables, as school choice is the main interest of this study.

Not involving main variables explaining the variation in labour outcomes, such as academic ability, may lead to an estimation bias. Since the data on test scores is only available to those born after 1975, to find out how severe the exclusion of this variable affects estimation bias, the regressions are re-estimated among samples that have information on this variable, both by involving and omitting test scores. The estimation results in Table 3 show no significant difference between the regression results that involve test scored and those that do not. This indicates a weak correlation between test scores and the four labour outcomes, conditional on other explanatory variables included in the regression. Therefore, leaving out the test score from the estimation is not the primary source of bias.

2. Instrumental variable estimates of labour outcomes

Instrumental variable estimations are carried out to correct for endogeneity bias, in which the estimation of labour outcomes reflects unobserved factors correlated with the school choice variable, such as workers' ability, motivation, or other systematic differences that may affect the labour outcomes. For instance, those who attended vocational schools relatively have less favourable condition than those attended general schools. Therefore, when the level of labour outcomes between the general and vocational schools are on average the same, this may indicate that vocational schools can improve the labour outcomes of their students (Chen, 2009). In other words, there is a possibility of downward bias or underestimating the positive effect of attendance at vocational schools.

Table 4. Instrumental variable estimates of labour outcomes, male and female

School Choice	2SLS							
	Male				Female			
	LFP	Employment	Formal	Income	LFP	Employment	Formal	Income
Public Vocational	0.437**	0.306	-0.176	-1.542	0.192	0.239	-0.283	-0.095
	(0.201)	(0.239)	(0.341)	(1.083)	(0.293)	(0.300)	(0.248)	(1.103)
Private General	0.156	0.169	-0.163	-1.213**	0.0361	0.0378	-0.226	0.608
	(0.098)	(0.117)	(0.170)	(0.512)	(0.157)	(0.161)	(0.159)	(0.886)
Private Vocational	0.097	0.0972	-0.176	-1.101**	-0.332	-0.273	-0.242	-2.775***
	(0.097)	(0.115)	(0.154)	(0.488)	(0.221)	(0.226)	(0.242)	(0.895)
Observations	1665	1665	1406	1260	1876	1876	1055	842
Overidentification test (p-value)	0.7259	0.7323	0.2719	0.9640	0.7990	0.7067	0.6926	0.4371

Notes: *** Indicates 1% significance, ** indicates 5% significance, and * indicates 10% significance; and standard errors robust to heteroscedasticity are in parentheses. Public General acts as baseline among the four school types. Results are presented for selected variables, as school choice is the main interest of this study. The sample size is reduced to 1665 for men and 1876 for women since only samples with non-missing values for the instrumental variables are included in the analysis.

To correct for endogeneity bias, the author uses multiple instrumental variables including parents' educational backgrounds, proportion of each school type in the district to reflect the supply of each school type, and other individual characteristics that are not directly correlated with labour outcomes. The selected instruments should have no direct influence on labour outcomes and have a strong relationship with school choice (relevance). In addition, the instruments also cannot be correlated with the error term in the structural equation (exogeneity or validity). The null hypothesis that the instruments are not correlated with the endogenous variable is rejected; this shows that the instruments satisfy the relevance assumption. Moreover, F-test indicates that the instruments are jointly significant in explaining school choice. Although the validity assumption cannot be tested, test on whether the estimates change depending on which subset of instruments is used can be conducted as in this case more instruments are available than what is needed. The basic intuition of this test is that if all instruments are valid, then the different estimates should be similar to each other. The Sargan-Hansen tests on overidentifying restrictions show failure to reject the null hypothesis in which the instruments are valid instruments, i.e. uncorrelated with the error term and that the excluded instruments are correctly excluded from the estimated equation. The results of these tests should be used with caution, as this may still cast doubt on the validity of the instruments. The author is also aware of possible correlation between the instruments and the structural error term. For example, the availability of a particular type of school may be correlated with other unobservable community characteristics, which also could affect labour outcomes.[1]

---

[1] The author still attempts to do estimations using instrumental variables despite the limitations of the variables used. According to Newhouse and Suryadarma (2011), there is no plausible instrument variable for school choice as it is very difficult to test its validity. Nevertheless, they argued that data on historical school construction, as in Duflo (2001), could perform as a candidate for better instruments.

Table 5. Instrumental variable estimates of labour outcomes, male and female

School choice	Male				Female			
	LFP	Employment	Formal	Income	LFP	Employment	Formal	Income
Public Vocational	0.607**	0.418	-0.424	-1.866	0.327	0.406	-0.352	1.432
	(0.264)	(0.295)	(0.639)	(1.253)	(0.365)	(0.388)	(0.281)	(2.215)
Private General	0.216*	0.213	-0.247	-1.332**	0.124	0.143	-0.242	2.395
	(0.122)	(0.136)	(0.271)	(0.566)	(0.200)	(0.214)	(0.190)	(1.938)
Private Vocational	0.0907	0.0944	-0.195	-1.123**	-0.457*	-0.417	-0.289	-4.541**
	(0.114)	(0.127)	(0.185)	(0.520)	(0.276)	(0.294)	(0.305)	(1.798)
Observations	1665	1665	1406	1260	1876	1876	1055	842
Overidentification test (p-value)	0.7774	0.7485	0.2843	0.9669	0.8267	0.7441	0.7006	0.7056

Notes: *** Indicates 1% significance, ** indicates 5% significance, and * indicates 10% significance; and standard errors robust to heteroscedasticity are in parentheses. Public General acts as baseline among the four school types. Results are presented for selected variables, as school choice is the main interest of this study. The sample size is reduced to 1665 for men and 1876 for women since only samples with non-missing values for the instrumental variables are included in the analysis.

Even when the instruments are valid, there is still a problem of weak instruments. The weak identification tests using F statistics version of the Kleibergen and Paap (2006) indicate the presence of weak instruments. In addition, the author uses the Angrist and Pischke procedure to check for weak instruments by comparing the Two-Stage Least Squares (2SLS) in Table 4 and the Limited Information Maximum Likelihood (LIML) in Table 5. The F statistics on the excluded instruments are 29.86 for men and 34.35 for women, which are in the safe region (the rule-of-thumb is that F statistics above 10 are in the safe region). Using the same set of instruments, the overidentified 2SLS estimates are quite different to those of median-unbiased LIML estimates. Therefore, weak instruments are probably a problem and may lead to several negative consequences, including large inconsistency even in only small violations of instruments validity, finite sample bias that can be substantial even in a large sample, high standard errors, and change in the asymptotic distribution of the IV estimators that impedes inferences. In addition, IV estimations have to be carried out with caution since endogenous variables are categorical variables. Hence to avoid estimating 'forbidden regression', the author estimates the first stage using linear regressions (Angrist & Pischke, 2008).

C.   Heterogeneous effects of labour outcomes by age

Graduates of vocational schools may have a rapid increase in labour outcomes early in their careers because their skills and expertise can be directly applied in the workplace. Meanwhile, general school graduates may not have the same experience early in their career because they require further training before finally able to use their skills in employment. However, over time, the increased labour outcomes of vocational school's graduates are likely to gradually decrease, for example, because the skills possessed are outdated, and graduates are no longer receiving skills training. On the other hand, over time, general school graduates may find themselves easily adjusted to the needs of the employer as their skills tend to be flexible and adaptable to the industrial development (Hanushek, 2017). This section will discuss the aspect of heterogeneity that occurs over time during the careers between students graduated from public general schools and those from public vocational school.
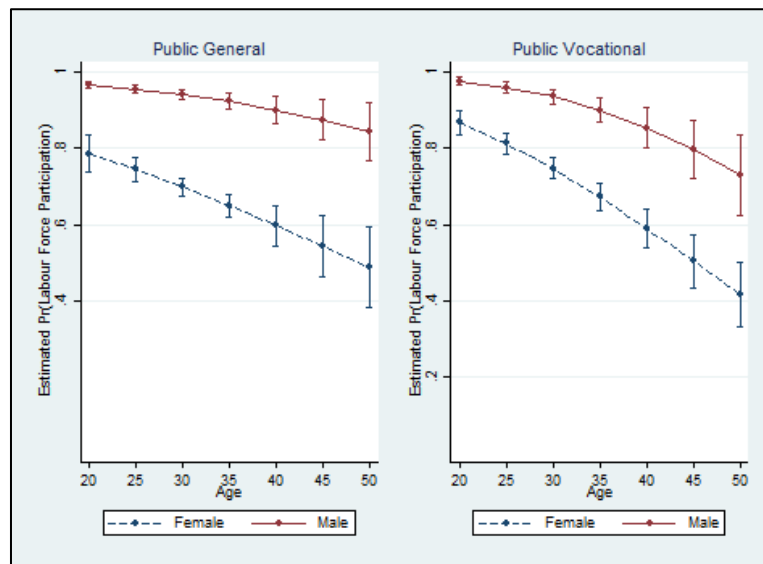
Figure 2. Estimated probability of labour force participation

Figure 2 shows the predicted probability of labour force participation. Overall, men have a higher predicted probability of participating in the labour force than women, both for those who attended public general and public vocational schools. Early in the career age, both men who graduated from public general and public vocational schools have the same predicted probability of participating in the labour force, which is around 0.9. Nonetheless, men who graduated from public vocational schools experience a steeper decline in the predicted probability of being in the workforce, especially starting at the age of 35. The predicted probability of being in the labour force for females is similar to that for males. However, compared to men, a decreasing effect in the predicted probability of labour force participation for women is higher, which can be seen from its steeper slope.

Figure 3. Estimated probability of employment
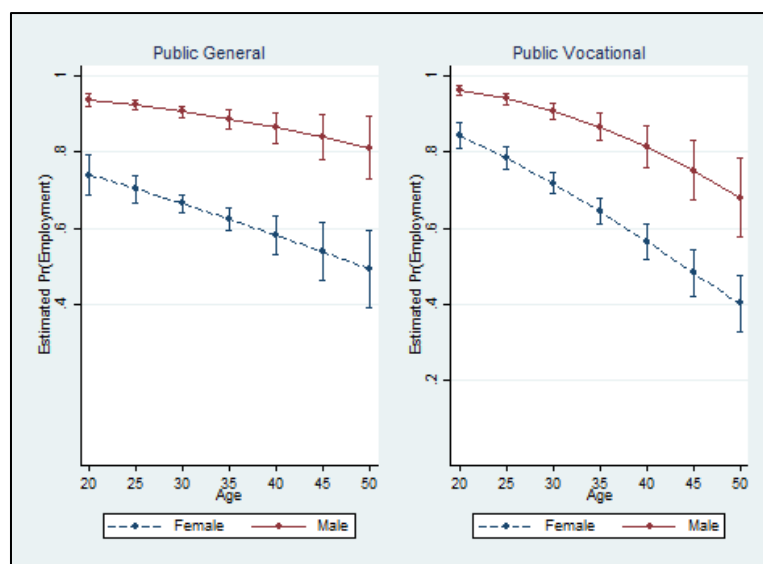
The predicted probability of employment (figure 3) has almost the same pattern as that of labour force participation, and in general, men have a higher predicted probability of getting a

job than women. When men are at age 20, the predicted probability of employment of those graduated from public vocational school is slightly above those who graduated from public general schools. Nevertheless, men who graduated from public general schools experience a slower decline along with their age in terms of probability of employment than those graduated from private general school; when they are 50 years old, the value is still around 0.8. In contrast, the predicted probability of employment of men who graduated from vocational schools drops to 0.7 during their lifetime. A corresponding pattern also applies to women. As women get older, those who graduated from public vocational schools have a more rapid decline in the predicted probability of employment.

In general, the predicted probability of job formality (figure 4) has a declining pattern throughout someone's life, for both male and female. A steeper decline in the predicted probability of job formality is experienced by those who graduated from public vocational schools. Besides, the difference in the predicted probability of job formality between men and women who graduated from public general schools is not very significant. However, interestingly, for graduates of public vocational schools, women have a higher predicted probability to work in the formal sector than men who graduate from the same type of school. This can be explained by the rapid growth of the service sector in Indonesia (Findlay and Pangestu, 2016). Accordingly, most women who attended vocational school choose majors related to this sector such as finance, business management, and hospitality.

Figure 4. Estimated probability of job formality
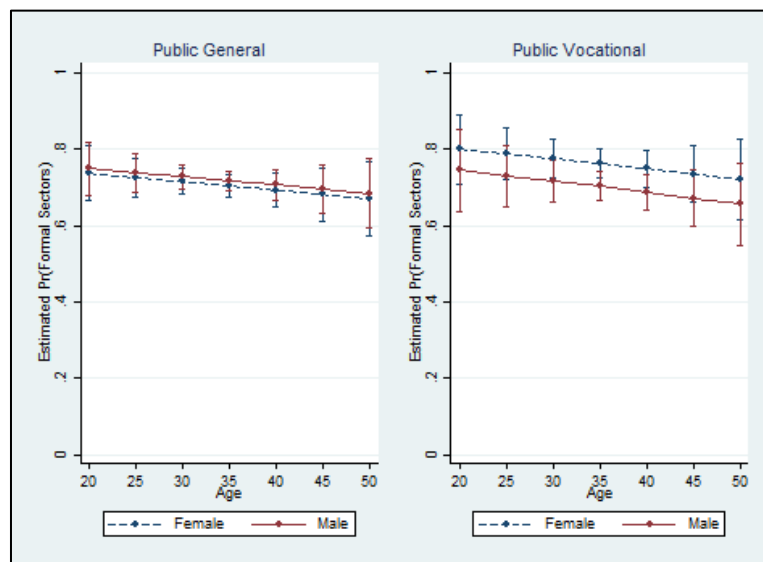
In regard to the marginal effect of log income, the difference between public general and public vocational graduates is shown in figure 5. In general, whether graduated from a public or public vocational school, male enjoy a higher income effect than female. At the beginning of men's careers, the marginal effect on log income is higher for those graduated from public vocational schools than those graduated from public general schools. However, as men get older, those who graduated from public general schools receive an increasing marginal effect on log income, and at the age of 50, the value reaches 16.7. Meanwhile, men who attended public vocational school experience a decline in the marginal effect on log income over their lifetime.

Figure 5. Marginal effect on log income
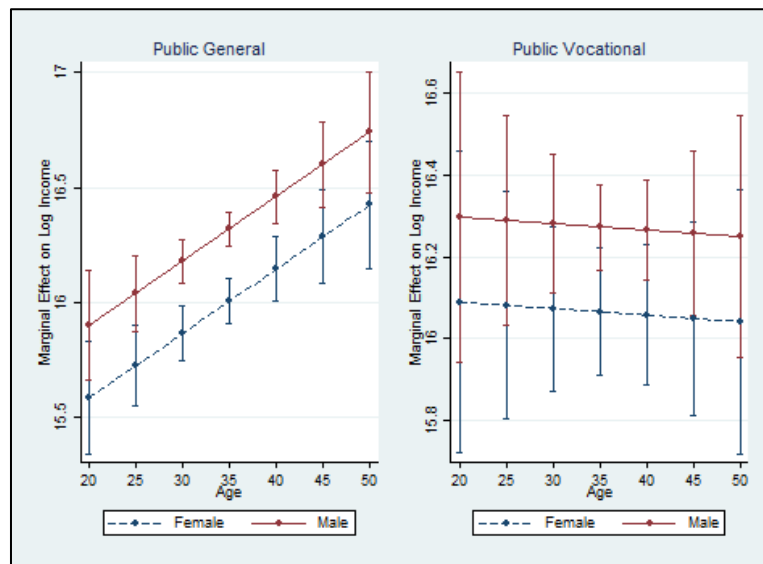
Women also experience a similar pattern to men regarding the marginal effect on log income (Figure 5). Early in the career age, women who graduated from public vocational school have a relatively higher marginal effect on income than those from public general schools, even higher than men who attended public general schools. Females who graduated from public general schools, nonetheless, experience an increasing marginal effect on income throughout their ages. On the other hand, there is a gradual deterioration in the marginal effect on log income for females who graduated from vocational schools over their lifetime.

D. Heterogeneous effects of labour outcomes by academic ability

The estimation results in this section will discuss the heterogeneity of labour outcomes based on differences in students' academic ability. This is conducted by comparing students who have below-average test scores with those who have above-average test scores.

Table 6. Test scores and the effect of school types on labour outcomes, male

School choice	Marginal effect (at the mean)							
	Below average test score				Above average test score			
	LFP	Employment	Formal	Income	LFP	Employment	Formal	Income
	Probit	Probit	Probit	OLS	Probit	Probit	Probit	OLS
Public Vocational	0.034	0.097*	0.004	0.224	0.030	0.047	-0.028	0.045
	(0.041)	(0.052)	(0.067)	(0.19)	(0.023)	(0.029)	(0.039)	(0.118)
Private General	-0.014	0.011	-0.031	-0.003	-0.006	-0.018	-0.040	-0.123
	(0.025)	(0.033)	(0.048)	(0.150)	(0.017)	(0.023)	(0.034)	(0.108)
Private Vocational	0.034	0.034	-0.032	-0.031	0.032*	0.001	-0.046	0.039
	(0.024)	(0.031)	(0.046)	(0.142)	(0.020)	(0.024)	(0.034)	(0.110)
Observations	834	880	710	609	1224	1331	1122	1004
Pseudo R^2	0.1890	0.2322	0.1107	0.4825	0.1922	0.2070	0.1334	0.4449

Notes: *** Indicates 1% significance, ** indicates 5% significance, and * indicates 10% significance; and standard errors robust to heteroscedasticity are in parentheses. Results are presented for selected variables, as school choice is the main interest of this study.

Table 6 indicates that among men who have below-average test scores, public vocational graduates have higher employment opportunities than public general graduates. The change in employment probability for those graduated from public vocational school is 9.70 percentage points (significant at 10 per cent level). On the other hand, among public vocational graduates, men who scored above average in the national final examination receive a lower increase in employment opportunities than those with below average scores. Moreover, when they are already employed, male vocational-school graduates with high test scores enjoy lower wage premium than their counterparts. The additional wage received by males with low test score who attended public vocational schools is 22.4 per cent, while those with high test scores earn 4.50 per cent more. This suggests that being enrolled in the public vocational school is more beneficial for men with low academic ability.

Table 7. Test scores and the effect of school types on labour outcomes, female

School choice	Marginal effect (at the mean)							
	Below average test score				Above average test score			
	LFP	Employment	Formal	Income	LFP	Employment	Formal	Income
	Probit	Probit	Probit	OLS	Probit	Probit	Probit	OLS
Public Vocational	0.025	0.023	-0.224***	-0.600**	0.013	0.014	0.068*	0.156
	(0.057)	(0.058)	(0.068)	(0.237)	(0.034)	(0.036)	(0.041)	(0.152)
Private General	-0.042	-0.033	-0.0824	-0.070	-0.015	-0.014	-0.024	-0.111
	(0.042)	(0.044)	(0.050)	(0.195)	(0.032)	(0.033)	(0.035)	(0.134)
Private Vocational	-0.011	0.022	-0.112**	-0.125	0.033	0.032	-0.008	-0.217
	(0.042)	(0.044)	(0.052)	(0.197)	(0.032)	(0.034)	(0.036)	(0.133)
Observations	856	856	476	404	1,495	1,495	915	777
Pseudo R^2	0.1372	0.1060	0.1831	0.3932	0.1202	0.0926	0.1941	0.3459

Notes: *** indicates 1% significance, ** indicates 5% significance, and * indicates 10% significance; and standard errors robust to heteroscedasticity are in parentheses t-statistics in parentheses. Results are presented for selected variables, as school choice is the main interest of this study.

The results for females are presented in table 7. Among graduates with low test scores, attending public or private vocational schools provides a lower opportunity to be able to work in formal sectors and a significant wage penalty. Meanwhile, unlike the case for males, females with high academic ability are more likely to benefit from attending public vocational schools in regard to job formality. Significant at 10 per cent level, those who graduated from public vocational schools with high test scores experience an increase in the probability for job formality of 6.80 percentage points. This may show that women that graduated from vocational schools with high test scores face higher opportunity cost of staying at home; hence they choose to actively work or look for jobs.

VI.   Conclusion and Policy Implications

The results suggest that public vocational school education does not provide a clear advantage for male graduates when entering the workforce. In particular, for men, the success of graduates is more dependent on whether they graduate from public or private schools than whether they are studying in general or vocational schools. Meanwhile, among females, this paper found that public vocational education provides better prospects of labour outcomes for women. Also, for both males and females, vocational education seems to increase the prospects of graduates to participate in the workforce, be in employment, and obtain formal employment early in their careers. However, this advantage gradually declines over time.

According to the heterogeneity estimates based on academic ability, the results indicate that being enrolled in public vocational school is more beneficial for men with low academic ability. Although the results suggest that women with high academic ability may benefit from attending public vocational school, the implementation of the expansion policy is likely to have a negative impact on students with higher academic ability. Students who excel academically are much more likely to study in public schools. Therefore, vocational expansion policies -- and the closure of public schools to transform into vocational schools -- will force more academic high-achievers to enter the vocational track. These students are the most vulnerable to losses due to investments in vocational education, especially when current economic conditions are increasingly valuing employers with general cognitive expertise.

The estimation result of this empirical study shows no strong evidence to support the current vocational school expansion in Indonesia. From a policy perspective, those advocating vocational school expansions should further identify the potential gains from this. The government needs to pay attention to several points including the quality of vocational schools and labour market conditions, which are far more critical than merely expanding the number of vocational schools, especially as most vocational schools in Indonesia are still below national standards. Therefore, to improve the quality of vocational education, a minimum standard for vocational schools needs to be established and enforced. Other important improvements are necessary to increase the outcomes of vocational education, such as building stronger relationships with employers and industries, ensuring the availability of adequate financial resources, and improving the quality of teachers. Moreover, without any improvement in labour conditions, the expansion of vocational schools that are widely implemented today will not be cost-effective, neither for the government nor for the students. In addition, the vocation-school expansion policy needs to be examined further because the development of new public vocational schools in each province does not necessarily have a positive impact on the increase of access to upper-secondary education. As an example, the increase in the number of public vocational school may reduce the interest of students to enter private vocational school, which then may lead to closures of this type of school.

References

Angrist, J.D., and J.S. Pischke (2008). *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Arum, R., and Y. Shavit (1995). Secondary vocational education and the transition from school to work. *Sociology of Education*, pp. 187-204.

Attanasio, O., A. Kugler, and C., Meghir (2011). Subsidizing vocational training for disadvantaged youth in Colombia: evidence from a randomised trial. *American Economic Journal: Applied Economics*, vol. 3, No. 3, pp. 188-220.

Brunello, G., and D. Checchi (2007). Does school tracking affect equality of opportunity? New international evidence. *Economic Policy*, vol. 22, No. 52, pp. 782-861.

Chen, D. (2009). Vocational schooling, labor market outcomes, and college entry. Policy Research Working Paper, No. 4814. Washington, D.C.: World Bank.

Coleman, J.S., and Department of Health USA (1966). *Equality of Educational Opportunity*, vol. 2. Washington, D.C.: US Department of Health, Education, and Welfare, Office of Education.

Findlay, C., and M. Pangestu (2016). The services sector as a driver of change: Indonesia's experience in the ASEAN context. *Bulletin of Indonesian Economic Studies*, vol. 52, No. 1, pp. 27-53.

Finley, M.K. (1984). Teachers and tracking in a comprehensive high school. *Sociology of Education*, pp. 233-243.

Gamoran, A. (1987). The stratification of high school learning opportunities. *Sociology of Education*, pp. 135-155.

Hallinan, M.T., and R.A. Williams (1990). Students' characteristics and the peer-influence process. *Sociology of Education*, pp. 122-132.

Hanushek, E.A. (2006). Does educational tracking affect performance and inequality? Differences-in- differences evidence across countries. *The Economic Journal*, vol. 116, No.510, pp. C63-C76.

Hanushek, E.A., and others (2017). General education, vocational education, and labor-market outcomes over the lifecycle. *Journal of Human Resources*, vol. 52, No. 1, pp. 48-87.

International Labour Organisation (ILO) (2017). *Indonesia Jobs Outlook 2017*. Jakarta.

Kahyarara, G., and F. Teal (2008). The returns to vocational training and academic education: evidence from Tanzania. *World Development*, vol. 36, No. 11, pp. 2223-2242.

Kleibergen, F. and R. Paap (2006). Generalized reduced rank tests using the singular value decomposition. *Journal of Econometrics*, vol. 133, No. 1, pp. 97-126.

Metz, M.H. (1979). *Classrooms and Corridors: The Crisis of Authority in Desegregated Secondary Schools*. University of California Press.

Middleton, J., and, A. Ziderman (1997). Overview: World Bank policy research on vocational education and training. *International Journal of Manpower*, vol. 18, No. 1/2, pp. 6-28.

Middleton, J. (1993). *Skills for Productivity: Vocational Education and Training in Developing Countries*. New York: Oxford University Press.

Mingat, A., J.P. Jarousse, and M. Richard (1989). L-Enseignement Technique Court au Niger: une evaluation par le Marché. *Institut de Rechêrche sur l'Economie de l'Education.* Dijon Cedex, France.

Ministry of National Education and Culture (MNEC) (2007). *Rencana Strategis Departemen Pendidikan National Tahun 2005-2009 (Strategic Plan of the Ministry of National Education Year 2005-2009)*. Jakarta: Ministry of National Education and Culture.

_____ (2016). *Indonesia Educational Statistics in Brief*. Jakarta: Ministry of National Education and Culture.

Neuman, S., and A. Ziderman (1999). Vocational education in Israel: wage effects of the VocEd-occupation match. *Journal of human resources*, pp. 407-420.

Newhouse, D., and D. Suryadarma (2011). The value of vocational education: high school type and labour market outcomes in Indonesia. *The World Bank Economic Review*, vol. 25, No. 2, pp. 296-322.

Oakes, J. (1985). *Keeping Track: How Schools Structure Inequality*. New Haven, CT: Yale University Press.

Psacharopoulos, G. (1997). Vocational education and training today: challenges and responses. *Journal of Vocational Education and Training,* vol. 49, No. 3, pp. 385-393.

Shavit, Y., and W. Muller (2000). Vocational secondary education. *European Societies*, vol. 2, No. 1, pp. 29-50.

Shavit, Y., and R.A. Williams (1985). Ability grouping and contextual determinants of educational expectations in Israel. *American Sociological Review*, pp. 62-73.

Tilak, J.G. (2002). Vocational education and training in Asia. In *The Handbook on Educational Research in The Asia Pacific Region*, J.P. Keeves and R. Watanabe, eds. Kluwer.

Vanfossen, B.E., J.D. Jones, and J.Z. Spade (1987). Curriculum tracking and status maintenance. *Sociology of Education*, pp.104-122.

World Bank (2010). *Indonesia Labour Market Report*. Jakarta. Available from http://datatopics.worldbank.org/hnp/files/edstats/idnwp10c.pdf. Accessed 1 May 2017.

Recent MPFD Working Papers

WP/13/01	Policies for structural transformation: An analysis of the Asia-Pacific experience by C.P. Chandrasekhar and Jayati Ghosh	
WP/14/01	G20 agenda for the World Economy: Asia-Pacific perspectives By Sudip Ranjan Basu, Alberto Isgut and Daniel Jeongdae Lee	
WP/15/01	Infrastructure Financing, Public-Private Partnerships, and Development in the Asia-Pacific Region by Gilberto Llanto, Adoracion Navarro, Ma. Kristina Ortiz	
WP/15/02	Financing for Development: Infrastructure Development in the Pacific Islands by ESCAP Pacific Office	
WP15/03	Capital Market Development and Emergence of Institutional Investors in the Asia-Pacific Region by Hans Genberg	
WP/15/04	Trade Finance for Sustainable Development in Asia and the Pacific by Sailendra Narain	
WP/15/05	Financing Small and Medium Sized Enterprises for Sustainable Development: A View from the Asia-Pacific Region by Nick Freeman	
WP/15/06	Financing the Social Sector: Regional Challenges and Opportunities by Social Development Division, ESCAP	
WP/15/07	Inclusive Finance in the Asia- Pacific Region: Trends and Approaches by Md. Ezazul Islam	
WP/15/08	Climate finance in the Asia-Pacific: Trends and Innovative Approaches by Ilaria Carrozza	
WP/15/09	Financing Disaster Risk Reduction for sustainable development in Asia and the Pacific by Disaster Risk Reduction Section, ICT and Disaster Risk Reduction Division, ESCAP	
WP/15/10	Financing Statistics Development in Asia and the Pacific by Statistics Division, ESCAP	
WP/15/11	Financing Sustainable Development – What Can We Learn from The Australian Experience of Reform? by Wayne Swan	
WP/15/12	Financing Development Gaps in the Countries with Special Needs in the Asia-Pacific Region by Mustafa K. Mujeri	
WP/15/13	Polarizing world: GDP, development and beyond by Michael Shashoua and Sudip Ranjan Basu	
WP/16/01	Strengthening the capacities of Asia and the Pacific to protect workers against unemployment By John Carter	
WP/16/02	Asia-Pacific's experience with national systems of TVET By Jenny Grainger, Liz Bowen-Clewley and Sarah Maclean	
WP/16/03	An analytical framework for identifying optimal pathways towards sustainable development By Jaebeum Cho, Alberto Isgut, and Yusuke Tateno	
WP/16/04	Pathways for adapting the Sustainable Development Goals to the national context: the case of Pakistan By Jaebeum Cho, Alberto Isgut, and Yusuke Tateno	
WP/16/05	Obstacles to productivity in Asia and Pacific region: finance reigns By Filipe Lage de Sousa	
WP/16/06	China's productivity: past success and future challenges By Yanqun Zhang	
WP/16/07	Fostering productivity in the rural and agricultural sector for inclusive growth and sustainable development in Asia and the Pacifi By Upali Wickramasinghe	
WP/16/08	Productivity growth in India: determinants and policy initiatives based on the existing literature By Arup Mitra	

WP/16/09	Complementarities between the global programmes of action and the 2030 Agenda for Sustainable Development By Alberto Isgut, Ran Kim, Gabriel Spaizmann, Yusuke Tateno and Naylin Oo
WP/17/01	What's Gender Got to Do with Firm Productivity? Evidence from Firm Level Data in Asia By Steve Loris Gui-Diby, Diana Rodriguez-Wong and S. Selsah Pasali
WP/17/02	Estimating infrastructure financing needs in Asia-Pacific least developed countries, landlocked developing countries and small island developing States By Candice Branchoux, Lin Fang and Yusuke Tateno
WP/17/03	Do Data Show Divergence? Revisiting Global Income Inequality Trends By Sudip Ranjan Basu
WP/17/04	Metropolitan city finances in Asia and the Pacific region: issues, problems and reform options By Roy Bahl
WP/17/05	Environmental tax reforms in Asia and the Pacific By Jacqueline Cottrell, Damian Ludewig, Matthias Runkel, Kai Schlegelmilch and Florian Zerzawy
WP/17/06	Issues paper on tax policy and public expenditure management in Asia and the Pacific By Zheng Jian and Alberto Isgut
WP/17/07	Tax incentives and tax base protection in developing countries By Joosung Jun
WP/17/08	Prospects for progressive tax reforms in Asia-Pacific By Zheng Jian and Daniel Jeongdae Lee

READERSHIP SURVEY

The Macroeconomic Policy and Financing for Development Division of ESCAP is undertaking an evaluation of this publication, *From School to Work: Does Vocational Education Improve Labour Market Outcomes? An Empirical Analysis of Indonesia*, with a view to making future issues more useful for our readers. We would appreciate it if you could complete this questionnaire and return it, at your earliest convenience, to:

> Director
> Macroeconomic Policy and Financing for Development Division
> ESCAP, United Nations Building Rajadamnern Nok Avenue Bangkok 10200, THAILAND

QUESTIONNAIRE

	Excellent	Very good	Average	Poor
1. Please indicate your assessment of the *quality* **of the publication on:**				
• Presentation/format	4	3	2	1
• Readability	4	3	2	1
• Timeliness of information	4	3	2	1
• Coverage of subject matter	4	3	2	1
• Analytical rigour	4	3	2	1
• Overall quality	4	3	2	1
2. How *useful* **is the publication for your work?**				
• Provision of information	4	3	2	1
• Clarification of issues	4	3	2	1
• Its findings	4	3	2	1
• Policy suggestions	4	3	2	1
• Overall usefulness	4	3	2	1

3. Please give examples of how this publication has contributed to your work:

....
....
....
....
....

4. Suggestions for improving the publication:

....
....
....
....
....

About Economic and Social Commission for Asia and the Pacific (ESCAP)

The Economic and Social Commission for Asia and the Pacific (ESCAP) serves as the United Nations' regional hub promoting cooperation among countries to achieve inclusive and sustainable development. The largest regional intergovernmental platform with 53 member States and 9 associate members, ESCAP has emerged as a strong regional think-tank offering countries sound analytical products that shed insight into the evolving economic, social and environmental dynamics of the region. The Commission's strategic focus is to deliver on the 2030 Agenda for Sustainable Development, which it does by reinforcing and deepening regional cooperation and integration to advance connectivity, financial cooperation and market integration. ESCAP's research and analysis coupled with its policy advisory services, capacity building and technical assistance to governments aims to support countries' sustainable and inclusive development ambitions.

WWW.UNESCAP.ORG

TWITTER.COM/UNESCAP

FACEBOOK.COM/UNESCAP

YOUTUBE.COM/UNESCAP