Does working part-time during schooling affect dropout rates after the mandatory schooling years?

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Abstract

In this paper, I look at the effects of working part-time during primary or junior high school on dropout behavior after mandatory schooling years in Indonesia. I obtain my data from the Indonesian Family Life Survey (IFLS) and use a binary choice probit model to see if working during schooling provides a strong signal that a child will drop out of school immediately after mandatory schooling years. Moreover, I suggest a Linear Probability Model (LPM) with Instrumental Variable (IV) approach to elicit causal effects and find that working during primary or junior high school leads to a lower dropout rate among children in Indonesia.

Keywords— part-time employment, child work, dropout behavior, IV, causal effects, Indonesia.

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1 Introduction

The negative impacts of child labor have been extensively studied and documented in the last two decades, especially in the context of developing countries. Although there has been a decline in child labor of around 30% since 2000, the International Labor Organization (ILO) estimated that, in 2016, around 152 million children (aged 5-17) worldwide were still engaged in child labor. Notably, around 73 million among them were involved in what qualified as hazardous work (ILO 2017, p. 5). These numbers signify that the challenge of curbing the negative impacts of child labor remains formidable but essential. Moreover, it also signifies that understanding the overall impact of child work in a child's overall development in specific (as opposed to general) contexts is important in informing targeted policy decisions and interventions.

As such, this paper is focused on assessing the impact of part-time child work on schooling in Indonesia. In 2009, it was estimated that around 4.05 million children, which amounts to around 7% of the total population of children between the ages of 5-17, were engaged in some form of labor in Indonesia (MINISTER OF MANPOWER 2014). In addition, in 2010, it was estimated that over half of the total Indonesian workforce and about 30% of the young adult workforce (age 25-34) have had at most primary school education (Suryadarma and Jones 2013). Historically, low levels of education leading to a skill shortage in the labor force have been a continuing challenge for Indonesia where under-qualified workers still fill many positions (Allen 2016). Therefore, given that there is a high occurrence of both child labor and relatively low years of schooling in Indonesia, it seems imperative to understand if the occurrence of one influences the other. Moreover, since Indonesia is the 4th populous country in the world with the 10th largest economy in terms of PPP, obtaining a better understanding of whether child labor affects schooling has significant human capital implications not just for the country but for the whole world.

In this paper, I focus on a particular instance of child work. I look at children in Indonesia who work part-time during their mandatory schooling years, which for the individuals selected in the analysis is up to the end

of their junior high school [1], with the aim to better understand whether indulging in such work impacts their likelihood of remaining in school after the mandatory schooling years. First, I use a binary choice response model to determine if working during either primary school or junior high school provides a strong signal that a child will drop out of school immediately after mandatory schooling years. Second, I use a Linear Probability Model (LPM) with Instrumental Variables (IV) to elicit causal effects of working during primary or junior high school on the likelihood of dropping out immediately after the mandatory schooling years. In these models, I show that an important exclusion restriction employed in previous works, i.e. excluding unemployment rate variable in the structural equation, appears to be invalid. I also comment on the weak nature of commonly used lagged variables as instruments and suggest a more robust instrument in its stead.

Notably, under the very strong assumption that child work is exogenous, I find a positive relationship between part-time work and the likelihood of dropping out. However, this effect is reversed when I allow child work to be endogenous. The estimates obtained under this assumption indicate that part-time work leads to a lower dropout rate. I find ample evidence in the child labor literature in Indonesia that report affordability concerns as a deterrent to formal education and consequently provide strong support to the latter result because added income from part-time work would help offset the financial barriers to education for children in many households. In this way, findings from this paper reinforce the implication that some forms of child work in particular contexts can lead to overall positive outcomes on various levels.

2 Literature Review

There is a plethora of empirical papers on the adverse impacts of child labor and on the benefits of schooling. The findings on the latter definitely formed a part of the motivation in undertaking this project. For instance, especially in the case of developing countries, school attendance is found to play a strong role in a successful transition to adulthood through the delay of

[1] This is defined as the end of Grade 9

marriage and childbearing (Lloyd and Mensch 1999). For women, research suggests that an increase in years of schooling is positively linked with an increase in age at marriage and age at first birth (Basu 2002). These results indicate that higher years of schooling have huge public and reproductive health implications. Moreover, the positive relationship between years of schooling and a successful transition to adulthood has been well-established (Lloyd, Behrman, et al. 2006). And, the positive marginal monetary returns, such as wages, to schooling has been well-documented in many countries (see Psacharopoulos 1985; Psacharopoulos and Patrinos 2004, for an overview of the international literature on schooling and earnings).

In spite of many such documented benefits of schooling, a study by Utomo et al. (2014) found a high incidence of young people dropping out of school prior to completing their secondary schooling in Indonesia, presumably to pursue some form of underage employment. Using data from households in Jakarta, this paper found that less than a quarter of dropouts found work in the first year and around 30% of the sample neither worked nor studied between the ages of 12-18, i.e. after dropping out, children did not go back to school even when they did not have employment (ibid.). These findings suggest a serious implication on the prospects of human capital in Indonesia as early exits from schooling tend to derail young people's socio-economic trajectories in their early adulthood and perpetuate a cycle of inter-generational disadvantage (ibid.). Especially given that a significant portion of students who drop out fail to resume their schooling even at periods when they do not have any form of paid employment, finding the causes behind why students drop out of school in the first place demands a greater focus from a policy point of view. This, too, serves as a motivation for this paper.

There are several studies that have examined the link between part-time student employment on participation and attrition in secondary schooling in specific localized contexts and have reported contradictory results. A study by Vickers, Lamb, and Hinkley (2003) uses a cohort of the Longitudinal Surveys of Australian Youth (LSAY-95) to find that working during Year 9 reduced the likelihood of completing Year 12, after controlling for individual characteristics pertaining to socio-economic status, demographic

and educational background and geographical features. A similar study by Rokicka (2014) in England looks at student's part-time employment status at age 16 and its impact on educational participation at age 17. Her findings suggest that those students who were employed part-time during the school term have a lower probability of continuing in post-compulsory education, even when controlling for final exam results. A paper by Beffy, Fougère, and Maurel (2010) looks at French university enrolment data and used bivariate probit estimation to suggest a very large detrimental effect of holding a regular part-time job on graduation probability.

On the other hand, there are several studies that find no significant impact of part-time work on academic progress and schooling (see D'Amico 1984; Rothstein 2007). Therefore, more than anything, the results from these studies highlight the importance of taking context into account as it differs massively across countries, and their educational systems and social echelons. And, it needs to be noted that these papers are based on the context of developed countries where students are not confronted with the same decision of dropping out after junior high school. Moreover, there is a dearth of similar well-regarded publications with a focus on developing countries. Hence, my paper contributes to the existing literature by estimating the impact of part-time work on schooling in the particular context of Indonesia and by producing causal estimates using contextually relevant structural equations and instruments.

3 Methodology

In this section, I will first describe the data collection process that will enable us to conduct appropriate empirical analysis. Secondly, I will reiterate the research questions of interest and provide details on the econometric specifications that will allow us to elicit answers to those questions from our processed data.

3.1 Data and descriptive statistics

The data used in this paper is obtained from the Indonesian Family Life Survey (IFLS). It is a publicly available [2] continuing longitudinal socio-economic and health survey dataset that is based on a sample of households across Indonesia representing about 83% of the Indonesian population residing in 13 of the nation's 26 provinces in 1993. The first wave of the survey interviewed 7224 households. By 2015, five waves of the survey had been fielded. It is the most comprehensive household-level dataset for Indonesia whose breadth of topics covered allows us to control for many relevant variables in my paper.

The sample is extracted from the IFLS dataset in the following way. For any year ranging from 1993 to 2015, I select students belonging to households interviewed for the first time, who were enrolled in primary education (as mandated by law) and track their academic progress till they drop out. For each student, I obtain information on whether they worked during primary school, whether they did so during junior high school and whether they dropped out of school as soon as they finished junior high school. The year that each individual finishes junior high school education is labeled their decision year, as it is the earliest year in which they can legally choose to drop out from school [3]. I also obtain various time-constant individual characteristics, such as education levels of both parents, and time-varying characteristics, such as the provincial unemployment rate, for each student corresponding to their decision year. The generated final sample comprises 10,922 students.

Table 1: Summary of dropout behavior in our sample

Variable	Mean	Std. Dev.	N
Dropout(after junior high school)	0.207	0.405	10922

Within the sample, Table 1 shows that around 21% of the students dropped out of school immediately after finishing junior high school. This finding is in line with our focus on the problem that a significant proportion of

[2] Available in the RAND website. See reference for details.

[3] Only students who provide dropout information for the decision year are kept in the sample.

children do not pursue education beyond the mandatory years.

Table 2 provides information on the number and proportion of students in the sample that work during primary school and/or junior high school in the form of a two-way table. We can see that 493 individuals work part-time while in primary school and 1,064 individuals work while in junior high school.

Table 2: Summary of the employment statistics of our sample

Work During Primary School	Work During Junior High School		
	1: Yes	0: No	Total
1: Yes	404 (3.70%)	89 (0.81%)	493 (4.51%)
0: No	660 (6.04%)	9,769 (89.44%)	10,429 (95.49%)
Total	1,064 (9.74%)	9,858 (90.26%)	10,922

Table 3 provides descriptive statistics on some other control variables of interest. Male is a binary variable that takes the value 1 if an individual is male, and 0 if female. 46% of the individuals in our sample are males. Similarly, village residence at decision year, or *vill_decision*, is another binary variable that takes the value 1 if an individual resides in a village during the decision year, and takes the value 0 if they do not. Around 38% of the individuals in our sample reside in villages during their decision year. Both mother's and father's education corresponds to their parent's years of education. We can see that, on average, fathers have stayed in schools longer than mothers for the individuals in the sample.

Table 3: Summary statistics of control variables

Variable	**Mean**	**Std. Dev.**	**N**
Male	0.46	0.498	10922
Father's education	7.67	4.271	10922
Mother's education	6.718	4.031	10922
Village residence @ decision year	0.379	0.485	10922

3.2 Model Specification

This section focuses on specifying structural regression models to obtain estimates that help me answer my research questions. The two research questions that this paper focuses on are as follows:

1. Is working during primary and/or junior high school **a strong signal** that a child will drop out of/stay in school immediately after mandatory schooling years?
2. Does working during primary and/or junior high school have a **causal effect** on dropping out after mandatory schooling years?

To answer the first question, I will estimate a binary choice probit model [4] and estimate the parameters of the equation as follows:

$$Pr(dropout_{it} = 1) = Pr(X_{it}\beta_1 + Z_i\gamma_1 + work\_prim_i\alpha_1 + \varepsilon_{1,it} \geq 0) \quad (1)$$

$$Pr(dropout_{it} = 1) = Pr(X_{it}\beta_2 + Z_i\gamma_2 + work\_jhigh_i\alpha_2 + \varepsilon_{2,it} \geq 0) \quad (2)$$

where

- $dropout_{it} = 1$, if an individual i drops out of school ASAP (t is the year they can first dropout),
- X_{it} is a vector of business cycle characteristics (eg: provincial unemployment rate),
- Z_i is a vector of time constant characteristics (eg: sex),
- $work\_prim_i = 1$, if an individual i worked while in primary school; 0 otherwise,
- $work\_jhigh_i = 1$, if an individual i worked while in junior high school; 0 otherwise,
- $\varepsilon_{1,it}$ and $\varepsilon_{2,it}$ consist of unobserved characteristics that affect dropout behavior in each specification respectively.

Following this estimation procedure, if we can reject the null hypothesis that $\alpha_1 = 0$, we can say that working in primary school helps forecast

[4] I will also estimate coefficients using analogous LPM and logit models for comparison.

future dropout behavior. An analogous result holds for α_2 and working in junior high school. However, it is unlikely that we can interpret these effects as causal because the existing economics literature on child labor provides ample evidence to suggest that OLS estimates will be biased given the endogenous nature of child market work (Beegle, Dehejia, and Gatti 2009; Wolff and Maliki 2008). That is, $work\_prim_i$ and $work\_jhigh_i$ are likely correlated with ε_{it}. Hence, we cannot derive causal effects from the OLS estimation of this model.

To estimate the causal effects of working during primary and/or junior high school, we need to treat them as endogenous and assume that there are variables x_{it} that affect the likelihood of working during schooling years. Then, we can adopt the Linear Probability Model (LPM) and follow the literature to estimate causal effects using Two-Stage Least Squares (2SLS) with some x_{it} as an instrument.

Here, we explore using lagged unemployment rates as an instrument. This use of lagged variables as instruments is influenced by its prevalence in empirical economic literature (Wang and Bellemare 2019). Following the literature, I create a variable $smoothunem_{it}$ that captures the smoothed provincial unemployment rate for individual i at time t as follows:

$$smoothunem_{it} = [unem_{i,t-1} + unem_{i,t-2} + unem_{i,t-3}]/3 \tag{3}$$

This smoothed unemployment rate will serve as an instrument on endogenous variables $work\_prim_i$ or $work\_jhigh_i$, leading to exact identification. At this point, in line with the existing literature, I opt to exclude current provincial unemployment rate from the structural equation. Hence, the first stage equations are

$$work\_prim_i = smoothunem_{it}\theta_1 + X_{it}\delta_1 + Z_i\eta_1 + v_{1,it} \tag{4}$$

$$work\_jhigh_i = smoothunem_{it}\theta_2 + X_{it}\delta_2 + Z_i\eta_2 + v_{2,it} \tag{5}$$

And the corresponding second stage equations are

$$dropout_{it} = X_{it}\beta_1 + Z_i\gamma_1 + \widehat{work\_prim}_i\alpha_1 + \varepsilon_{1,it} \quad (6)$$

$$dropout_{it} = X_{it}\beta_2 + Z_i\gamma_2 + \widehat{work\_jhigh}_i\alpha_2 + \varepsilon_{2,it} \quad (7)$$

Furthermore, given its high statistical significance in regression results of equations 1 and 2 (which we will see in table 4 and 5), I suggest a variation in the initial model with current provincial unemployment rate in the structural equation. This inclusion can be justified because the prediction results in tables 4 and 5 reject the null that the coefficient of provincial unemployment rate is zero and hence it helps predict the likelihood of dropping out for a student residing in that province.

Finally, upon discovering results that suggest a weak instrument problem with $smoothunem_{it}$, I suggest another exactly identified model that uses minimum legislated provincial wage as an instrument[5]. The choice of using the logarithm of the minimum legislated wage on a province level is motivated by the theoretical work of Basu (2002), who showed that changes in minimum wage leads to changes in the prevalence of child labor. He showed that a rise in minimum wage can affect child labor incidence in two primary ways: either by increasing the unemployment rate which forces adults in the household to send their children to work, particularly if they are on the brink of poverty, or by improving conditions of employed adult workers which means that there is a lower need for children to work and contribute to household earnings (ibid.).

In order to be a valid instrument, the natural log of provincial minimum legislated wage needs to satisfy two conditions. Firstly, it must be relevant – i.e. it must have a statistically significant relationship with $work\_prim_i$ and $work\_jhigh_i$. This can be verified in the results of first stage equations in Tables 8 and 9. Secondly, it must be uncorrelated with the error in the second stage equation or not have a direct causal relationship with the dependent variable. This is called the exclusion restriction. Unlike the relevance condition, this restriction is fundamentally untestable. However,

[5]This model still retains provincial unemployment rate variable in the structural equation.

if we look into how the provincial minimum legislated wage is calculated in Indonesia, we might be able to argue for the fulfillment of the exclusion condition. In Indonesia, minimum wage is determined based on a bundle of consumption items deemed essential for the livelihood of a single worker (Suryahadi et al. 2003). The minimum daily caloric content ranges from 2,600-3,000 daily. Hence, it is more of a proxy of affordability than income. Moreover, the actual process in determining the price of its bundle consists of negotiations between representatives of employers, employees, and the provincial government. Dropout rates are unlikely to have factored in this discussion. Hence, I use the log of the provincial minimum wage as an instrument to derive causal effects in my model. All of these results are discussed in the following section.

4 Empirical Results

There are two primary sets of results that we are interested in. The first set of results pertains to our first research question – does working during schooling help forecast future dropout behavior? The results in Tables 4 and 5 help answer this question. As can be seen, along with the probit model, I have also listed results from the Logit and LPM models for comparison. In general, the results given by each model are similar in terms of their direction. They show that the coefficient of $work\_prim$ is statistically insignificant, whereas that of $work\_jhigh$ is a positive significant value. Thus, knowing if a child worked in junior high school (or not) helps forecast future dropout behavior. In general, working during junior high is associated with a higher likelihood of dropping out of school after the mandatory schooling years.

Table 4: Regression results of dropout on working during primary school.

	dropout Probit	dropout Logit	dropout LPM
fatheduc	-0.068	-0.118	-0.016
	(0.005)***	(0.008)***	(0.001)***
motheduc	-0.072	-0.125	-0.016
	(0.005)***	(0.009)***	(0.001)***
male	-0.094	-0.177	-0.024
	(0.029)***	(0.051)***	(0.007)***
work_prim	**0.044**	**0.067**	**0.011**
	(0.066)	(0.112)	(0.018)
vill_decision	0.353	0.626	0.092
	(0.030)***	(0.052)***	(0.008)***
unem_t	4.462	8.017	1.045
	(0.823)***	(1.423)***	(0.207)***
underem_t	-0.053	-0.045	-0.010
	(0.235)	(0.409)	(0.058)
_cons	-0.265	-0.446	0.357
	(0.103)***	(0.178)**	(0.026)***
Pseudo R-sq	0.13	0.13	
N	10,922	10,922	10,922
Adj. R-sq			0.11

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Additionally, we can comment on how other controls can help forecast dropout behavior. Individual characteristics such as being a *male* and having a higher level of either *parent's education* are associated with a **lower probability** of dropping out. *Residing in a village* during the decision year is associated with a **higher probability** of dropping out. A *higher provincial unemployment rate* seems to be associated with a **higher probability** of dropping out. Provincial underemployment rates seem to have no statistically significant association with the likelihood of a student from that province dropping out. All of these results hold consistently regardless of whether we look at work in primary school or work in junior high school results.

Table 5: Regression results of dropout on working during junior high school.

	dropout Probit	dropout Logit	dropout LPM
fatheduc	-0.067	-0.117	-0.016
	(0.005)***	(0.008)***	(0.001)***
motheduc	-0.071	-0.124	-0.016
	(0.005)***	(0.009)***	(0.001)***
male	-0.106	-0.199	-0.027
	(0.030)***	(0.052)***	(0.007)***
work_jhigh	0.134	0.223	0.036
	(0.046)***	(0.079)***	(0.013)***
vill_decision	0.353	0.624	0.092
	(0.030)***	(0.052)***	(0.008)***
unem_t	4.462	8.021	1.043
	(0.824)***	(1.424)***	(0.207)***
underem_t	-0.052	-0.041	-0.010
	(0.235)	(0.409)	(0.058)
_cons	-0.278	-0.467	0.354
	(0.103)***	(0.178)***	(0.026)***
Pseudo R-sq	0.13	0.13	
N	10,922	10,922	10,922
Adj. R-sq			0.11

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

The second set of results pertain to the second question – are there causal effects of working during schooling on dropout behavior? To conduct this analysis, I initially used a specification and an IV that was more consistent with works in the existing literature. I used *smoothunem*, a variable capturing smoothed provincial unemployment rate, as an instrument for working during schooling variables. Additionally, I imposed the commonly applied exclusion restriction and dropped current provincial unemployment rate variable from the structural equation. The estimation results from this model are posted in Tables 6 and 7. The results suggest that there might be an issue of a weak instrument, mainly owing to two reasons: the coefficient of smoothed unemployment in the first stage is not statistically significant and all the standard errors in the second stage are very large.

Table 6: IV Regression results of dropout on working during primary school (without current unemployment in the structural equation).

	First Stage Results work_prim	Second Stage Results dropout
smoothunem	0.056	
	(0.087)	
fatheduc	-0.002	0.018
	(0.001)***	(0.054)
motheduc	-0.003	0.034
	(0.001)***	(0.080)
male	0.027	-0.567
	(0.004)***	(0.858)
vill_decision	0.005	-0.012
	(0.004)	(0.170)
work_prim		19.765
		(31.028)
_cons	0.058	-0.784
	(0.007)***	(1.886)
F stat	.	2.42
N	10,922	10,922

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Moreover, given that current provincial unemployment had significant coefficients in the forecast results, its exclusion from the structural equation of the IV regression is a little unconvincing. Hence, I opt to include it in the structural equations and rerun the regression. The corresponding results are listed in Tables 10 and 11 in Appendix A and B respectively. It can be seen that the weak instrument issue still persists in the IV regression.

Table 7: IV Regression results of dropout on working during junior high school (without current unemployment in the structural equation).

	First Stage Results work_jhigh	Second Stage Results dropout
smoothunem	0.084	
	(0.123)	
fatheduc	-0.004	0.037
	(0.001)***	(0.078)
motheduc	-0.005	0.048
	(0.001)***	(0.095)
male	0.084	-1.134
	(0.006)***	(1.641)
vill_decision	0.010	-0.035
	(0.006)	(0.190)
work_jhigh		13.183
		(19.462)
_cons	0.114	-1.145
	(0.010)***	(2.306)
F stat	.	2.74
N	10,922	10,922

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

This persistent issue of weak instrument motivated my search for an alternative instrument. The methodology part explains the rationale behind my use of the logarithm of the provincial minimum legislated wage as an instrument. Tables 8 and 9 display the corresponding results.

Again, higher education levels of either parent's leads to a lower probability of an individual dropping out. In both equations, the change in mother's education level has a higher effect on reducing the likelihood of dropout than father's education. Also, male students have around 20% higher likelihood of dropping out than a female student with the same working status in junior high school. Moreover, individuals in villages are more likely to drop out after the mandatory schooling years.

The coefficient of current unemployment yields an interesting result. An increase in the contemporary unemployment rate is linked with a higher

likelihood of an individual dropping out. This result might be counter-intuitive if we only think about the individuals and not their households. However, the **added-worker effect** can be used to better explain this result. That is, an increase in the unemployment rate indicates that the labor market income of many households decreases. Given that the primary bread-winners have a reduction in income, a household can greatly benefit from an additional member in the workforce to fulfill their consumption needs. This can help explain the associated higher likelihood of dropping out of school.

Table 8: IV Regression results of dropout on working during primary school (with logminwage as instrument).

	First Stage Results work_prim	Second Stage Results dropout
logminwage	0.006	
	(0.003)*	
fatheduc	-0.002	-0.028
	(0.001)***	(0.008)***
motheduc	-0.003	-0.034
	(0.001)***	(0.011)***
male	0.027	0.177
	(0.004)***	(0.116)
vill_decision	0.006	0.132
	(0.004)	(0.039)***
unem_t	0.084	1.673
	(0.081)	(0.706)**
work_prim		-7.357
		(4.117)*
_cons	-0.016	0.768
	(0.040)	(0.237)***
F stat	.	14.35
N	10,895	10,895

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

In addition, these regression results indicate that studies that exclude current unemployment rate from the structural equation run the risk of imposing an incorrect exclusion restriction.

Table 9: IV Regression results of dropout on working during junior high school (with logminwage as instrument).

	First Stage Results work_jhigh	Second Stage Results dropout
logminwage	0.015	
	(0.004)***	
fatheduc	-0.004	-0.027
	(0.001)***	(0.004)***
motheduc	-0.005	-0.029
	(0.001)***	(0.005)***
male	0.083	0.208
	(0.006)***	(0.077)***
vill_decision	0.010	0.118
	(0.006)*	(0.020)***
unem_t	0.070	1.248
	(0.115)	(0.361)***
work_jhigh		-2.776
		(0.895)***
_cons	-0.078	0.672
	(0.056)	(0.107)***
F stat	.	43.25
N	10,895	10,895

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Moving to the main result, owing to the negative values of associated coefficients, I conclude that working during either primary or junior high school actually **lowers** the probability of an individual dropping out immediately after mandatory schooling years. Given the general focus on negative aspects of child work in the literature, these results may initially appear somewhat surprising. However, as reiterated before, context is key in unpacking these empirical results. Despite there being free education till junior high school in Indonesia, parents still face substantial costs in sending their children to school since many schools still charge informal levies or fees, such as registration fees (Rosser and Joshi 2013; Erwida 2015). A paper by Suryadarma, Suryahadi, and Sumarto (2006) finds that there are substantial costs associated with transport, purchase of books and

stationery, uniforms, and other school requirements in Indonesia. In fact, in the *National Socio-Economic Survey* (2010), the vast majority of 13-15 year olds who had left school had done so for economic reasons, with 57% citing a lack of affordability as the main reason. Thus, given the contextual evidence, involvement in part-time work can entail benefits to students as it provides a source of added income that can help defray these costs and make education feasible for them.

5 Conclusion

This paper examines the impact of part-time child work on dropout behavior immediately after the mandatory schooling years in Indonesia. It looks into whether working in primary school or working in junior high school can help forecast dropout behavior, and finds that working during junior high school can be used in forecasting dropout behavior with students who work being more likely to drop out.

Additionally, this paper follows the literature to treat child work as endogenous and proposes a Linear Probability Model (LPM) with Instrumental Variables (IV) to derive causal effects of working during primary or junior high school on the likelihood of dropping out. I propose that studies that choose to exclude unemployment rate variables from the structural equation are likely to have imposed an incorrect exclusion restriction given the predictive power of the variable. In addition, after the use of a lagged variable, smoothed unemployment, as an instrument indicated issues of weak instrument, I propose the logarithm of provincial minimum legislated wage as an instrument. Using this instrument, we get more robust results that suggest that working during either primary or junior high school leads to a **lower** probability of dropping out. Citing relevant studies from child labor literature on Indonesia, I postulate that working part-time during schooling years enable children to help households defray the costs of education and therefore make education feasible. In this way, the results in this paper suggest that child work can have a positive impact on a child's overall development and as such, not all child work is bad with context being the key to unboxing the effects.

6 References

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Appendices

Appendix A

	First Stage Results work_prim	Second Stage Results dropout
smoothunem	-0.047	
	(0.150)	
fatheduc	-0.002	-0.034
	(0.001)***	(0.058)
motheduc	-0.002	-0.042
	(0.001)***	(0.086)
male	0.027	0.269
	(0.004)***	(0.941)
vill_decision	0.005	0.150
	(0.004)	(0.194)
unem_t	0.119	1.951
	(0.140)	(2.959)
work_prim		-10.655
		(34.179)
_cons	0.056	0.950
	(0.007)***	(1.914)
F stat	.	6.81
N	10,922	10,922

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 10: IV Regression results of dropout on working during primary school with current unemployment in the structural equation.

Appendix B

	First Stage Results work_jhigh	Second Stage Results dropout
smoothunem	0.072	
	(0.211)	
fatheduc	-0.004	0.012
	(0.001)***	(0.083)
motheduc	-0.005	0.018
	(0.001)***	(0.100)
male	0.084	-0.613
	(0.006)***	(1.746)
vill_decision	0.010	0.025
	(0.006)	(0.202)
unem_d	0.013	0.595
	(0.197)	(1.626)
work_jhigh		6.995
		(20.725)
_cons	0.114	-0.447
	(0.010)***	(2.374)
F stat	.	7.98
N	10,922	10,922

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 11: IV Regression results of dropout on working during junior high school with current unemployment in the structural equation.