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EFFECT OF GROWING UP POOR ON LABOR MARKET OUTCOMES: EVIDENCE FROM INDONESIA

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Abstract

This paper investigates the long-term effect of child poverty on labor market outcomes using a 14-year span of data from the Indonesian Family Life Survey. Our instrumental variables estimation shows that a child who lived in a poor family when aged between eight and 17 years old suffers from an 87% earnings penalty relative to a child who did not grow up in a poor family. The direct effect remains large after we account for a large set of mediators. Depending on the set of mediators that we use, we estimate an earnings penalty of between 85% and 90%. Similarly, we do not find any evidence that receiving various government transfer programs mediates the effect of growing up poor on earnings as adults.

Keywords: child poverty, Indonesia, instrumental variable, labor market outcomes

JEL Classification: J13, I32, J31

Contents

1. INTRODUCTION

An economic crisis hit Indonesia in the fall of 1997. The most prominent consequence of this crisis was the abrupt escalation of the poverty rate from 17% to 24% (Hadiwidjaja et al. 2012). Around 14 million out of the 200 million population in Indonesia fell into poverty, resulting in the number of poor reaching almost 48 million people, including children. As the crisis slowed down ten years later, the number of poor declined to 33 million but children still accounted for 42% (UNICEF 2013). Children experience a higher risk of poverty than adults because poor households generally consist of more children than non-poor households (World Bank 2011). The proportion of children living in the lowest quintile is 15% higher than those in the richest quintile, indicating that children suffer disproportionately from poverty (UNICEF 2013).

Researchers have established that conditions during childhood, even conditions in utero (Almond and Currie 2009; Currie 2009), have significant effects on adult outcomes, either directly through the conditions themselves or indirectly through, for example, educational attainment and life opportunities (Duncan et al. 1998). The phenomenon appears to be uniform in developed countries (for example, Currie 2009) and developing countries (for example, Maccini and Yang 2009). More importantly, the direct channel between childhood conditions and adult outcomes remains significant even after various mediators are controlled for (Case, Fertig, and Paxson 2005; Maika et al. 2017). This implies that once an individual experiences a negative shock during childhood, the effects on adult outcomes would likely remain even when receiving various government social transfers or other safety net programs.

Parental background, mainly income, plays a key role in determining conditions of children relative to the poverty threshold. Mayer (1997) pointed out that this role of parental income may influence further outcomes of children by two main competing hypotheses – the investment theory and the good parent theory. The first emphasizes parents investing time and money in their children through education, health, or a good home environment. The second says that low income induces greater parental stress and hence, poor parenting.

The empirical literature attempting to causally estimate the link between parental income and children's outcomes suggests that income has short- and medium-term effects, specifically on education (Duncan et al. 1998; Blau 1999; Levy and Duncan 1999; Chevalier et al. 2005; Dahl and Lochner 2012), health, and cognitive aspects (Loken et al. 2012; Maika et al. 2017) of the children. Few have investigated the long-term effects. Cho and Heshmati (2015), Lesner (2017), and Bellani and Bia (2019) investigated its impact on labor market outcomes and found the effects were consistent with the literature on short- and medium-term outcomes. Additionally, studies in the US found that income seems to matter more at the earlier ages of a child's life (Duncan et al. 1998; Levy and Duncan 1999), while studies in Northern Europe found that the impact is at its greatest when the child is in its teens (Jenkins and Schluter 2002; Lesner 2017).

However, both geographic streams of study differ in terms of the observed outcomes. Duncan et al. (1998) and Levy and Duncan (1999) focused more on the trait of ability, while Jenkins and Schluter (2002) and Lesner (2017) on achievement. According to Guo (1998), ability is a more stable trait and tends to be determined by both environmental and genetic factors early in life. Achievements like earnings on the other hand are more acquired. In Indonesia, both early- (at age < 7 years) and later-life (at age 7–14 years) poverty has equal effects on the cognitive ability of children (Maika et al. 2017). This paper adds to the literature by not only providing empirical work

on the long-term effect of childhood poverty but also capturing the effect when the timing of the low-income spell is deemed to have a more detrimental effect on the achievement of children. We examine whether poverty status at age 8–17 years old has any consequences on the hourly wage of individuals in the labor market sector 14 years later.

We use data from Indonesia to estimate the effects of being poor as a child on earnings as adults. We examine a large set of mediators, including home environment, parent characteristics, and more salient measures of human capital: performance in cognitive and numeracy tests as proxies for education and lung capacity and height as proxies for health. We use the economic crisis that Indonesia experienced in 1997–1998 as the exogenous shock. Indonesia's economy shrank by 14% in 1998 relative to the previous year (Bank Indonesia 2000) and 36 million individuals were pushed to absolute poverty over a period of less than one year (Suryahadi, Sumarto, and Pritchett 2003), making it one of Indonesia's worst economic downturns since the 1960s. Indonesia also makes an especially interesting case given the large social protection programs that the government launched as a response to the economic crisis (Sumarto, Suryahadi, and Widyanti 2002), many of which have since expanded to the current suite of government social protection programs (Sumarto and Suryadarma 2007).

We find that the effect of growing up poor on earnings as adults is large, negative, and statistically significant. Our instrumental variables estimation shows that a child who lived in a poor family when aged between eight and 17 years old suffers from an 87% earnings penalty relative to a child who did not grow up in a poor family. The direct effect remains large after we account for a large set of mediators. Depending on the set of mediators that we use, we estimate an earnings penalty between 85% and 90%. Similarly, we do not find any evidence that receiving various government transfer programs mediates the effect of growing up poor on earnings as adults.

We organize the rest of this paper as follows. The next section describes the data sources and how we set up the data. Section 3 presents poverty rates in Indonesia and wage distribution in 2014 by poverty status in 2000. Section 4 discusses the estimation strategy, while Section 5 provides the results. Sections 6 and 7 provide further results, and Section 8 concludes.

2. DATA

We use data from the 2000, 2007, and 2014 Indonesian Family Life Survey (IFLS). IFLS is an ongoing longitudinal survey in Indonesia conducted by the RAND Corporation in collaboration with several institutions. The first wave (IFLS1) was conducted in 1993 with a sample size of more than 22,000 individuals from 7,224 households. Although the samples were taken only from 13 of the 27 provinces in the country, it represents about 83% of the population (Strauss et al. 2009). In its latest wave (IFLS5), the recontact rate of original IFLS1 dynasties was 92%, while the recontact rate of individual target households was 90.5% (Strauss et al. 2016).

Our analysis is based on the latest three waves of IFLS since we aim to observe the long-term impact of children's exposure to poverty in 2000 compared to their adult outcomes in the labor market. We restrict the sample to respondents aged 8–17 years old who were not employed in 2000 but completed information on their wages in the 2014 labor module. The poverty lines used to construct children's poverty status in 2000 and 2007 were based on a method developed in Suryahadi et al. (2003). We define child poverty when they were included in a family where its per capita consumption was below the poverty line. Consumption expenditure data are used as a

basis to calculate poverty since income data could suffer from underreporting. So far, consumption is the best proxy for income in a developing country like Indonesia.

IFLS conducted mathematics and cognitive tests for its respondents. The results were provided in the cognitive assessment module, named the EK module. There are two types of EK module: EK1 and EK2. The former was designed for respondents aged 7–14 years old and the latter for 15–24 year-old-individuals. Both EK1 and EK2 consist of five numeracy problems but the shape matching problems are only eight in EK2 while there are five in EK1. The numeracy problems in EK2 are more complex than those in EK1 as they were designed for older respondents. In this paper, we only use the EK2 module in IFLS4 as the education aspect of human capital variable since the 8–17 year-old-individuals in 2000 had already reached the 15–24-year age range in 2007.

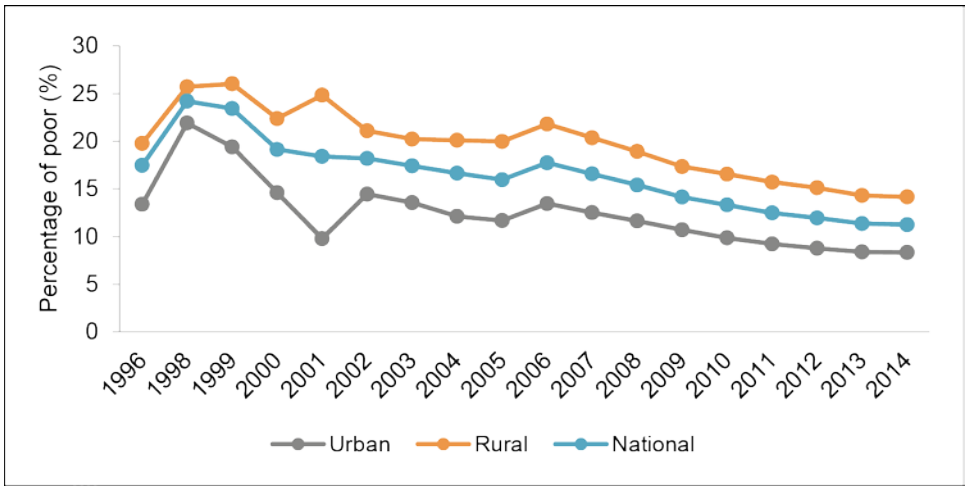
We use lung capacity for the health aspect of the human capital variable. Sim et al. (2017) argued that lung capacity is a better measure of health than height. This is due to the fact that height's trajectory is usually determined early in life. In contrast, lung capacity in adolescence can still be adversely affected by external variables like low air quality or hard physical activities.

Finally, we use National Socioeconomic Survey (Susenas) and gross domestic product (GDP) 1997 and 2000 data from Statistics Indonesia to create a shift-share instrument that would capture shocks on poverty during the Indonesian economic crisis in 1997/1998.

3. GROWING UP POOR IN INDONESIA

Figure 1 presents the headcount poverty in Indonesia between 1996 and 2014, the period relevant to our study, nationally and separated into urban and rural categories. In 1996, the year before the onset of the crisis, Indonesia was at the tail end of a sustained and significant poverty reduction. The crisis wiped out the gains in poverty reduction by a few years. Official statistics estimate that headcount poverty increased from 17% to 24% between 1996 and 1999.

Figure 1: National Poverty Rates, 1996–2014



Source: BPS.

Urban areas experienced a sharper increase in poverty between 1996 and 1998. According to Sumarto and Bazzi (2011), more than half of the increase in poverty

between 1996 and 1998 was caused by an increase in chronic poverty.[1] Specifically, in urban areas, there was an increase in the proportion of the high vulnerability group by more than fourfold (Suryahadi and Sumarto 2003. This increase was merely attributed to the sharp increase in the proportion of the low level of consumption (LLC) group. The LLC group are those belonging to the poor and non-poor who have expected consumption levels below the poverty line and have a high vulnerability to poverty. In other words, it consists of the chronic poor plus the very high vulnerability non-poor. Since an increased chronic poor was the major cause of increased poverty during the crisis and the very high vulnerability non-poor were also prone to poverty, a sharper increase in the proportion of this LLC group in urban areas explains the phenomenon of the severe impact of the crisis in urban areas.

Poverty was already on a downward trajectory in 1999 and continued to decrease. In 2001, urban headcount poverty was at around 10%, lower than the 1996 rate. In contrast, poverty in rural areas was still on an increasing trajectory until 1999, and only began declining in 2000. Between 2000 and 2014, poverty in both rural and urban areas was on a generally declining trend, although the rate of decline was small.

Table 1: Poverty Dynamics of Panel Data Households

Poverty Pattern	**2000**	**2007**	**Incidence** (%)	
Twice poor	Poor	Poor	2.23	
Once poor	Poor	Not poor	15.05	17.41
	Not poor	Poor	2.37	
Never poor	Not poor	Not poor	80.35	
Number of observations (N)			1,522	

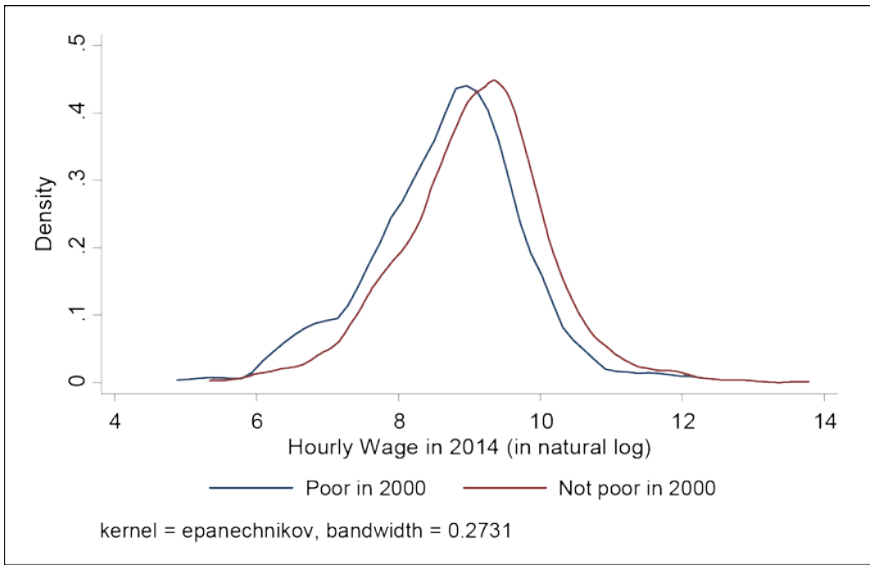
Source: Authors' calculation using IFLS data.

The transition matrix of poverty status between 2000 and 2007 can be seen in Table 1. The first row of the table shows the percentage of children in the sample (1,522 children) who were poor in both years (2.23%). Those who experienced poverty dynamics are in the second row (17.41%), while those who moved out of poverty (15.05%) are larger than those who fell into poverty (2.37%). This means that sample children who were poor in 2007 comprised 2.23% of children who were poor in 2000 and 2.37% of children who fell into poverty in 2007.

Figure 2 shows the hourly wage distribution, in 2014, of individuals aged between 22 and 31 years old by their household poverty status in 2000. These individuals were between eight and 17 years old in 2000 and are our main sample of interest. As shown in Figure 2, the hourly wage in 2014 of individuals who were living in a poor household in 2000 was significantly lower than individuals who were not living in a poor household. The unconditional average wage difference between the two groups is 32% (Table 4, Column 1) but, more importantly, the 2014 wage distribution of those who were not living in a poor household in 2000 has a first order stochastic dominance over the wage distribution of those who were living in a poor household in 2000.

[1] Chronic poverty is the condition where the currently poor have expected consumption levels below the poverty line and hence, most likely will remain poor in the future (Suryahadi and Sumarto 2003).

Figure 2: ln (Hourly Wage) Distribution of 22–31-Year Olds by 2000 Poverty Status, 2014 (N = 1,522)



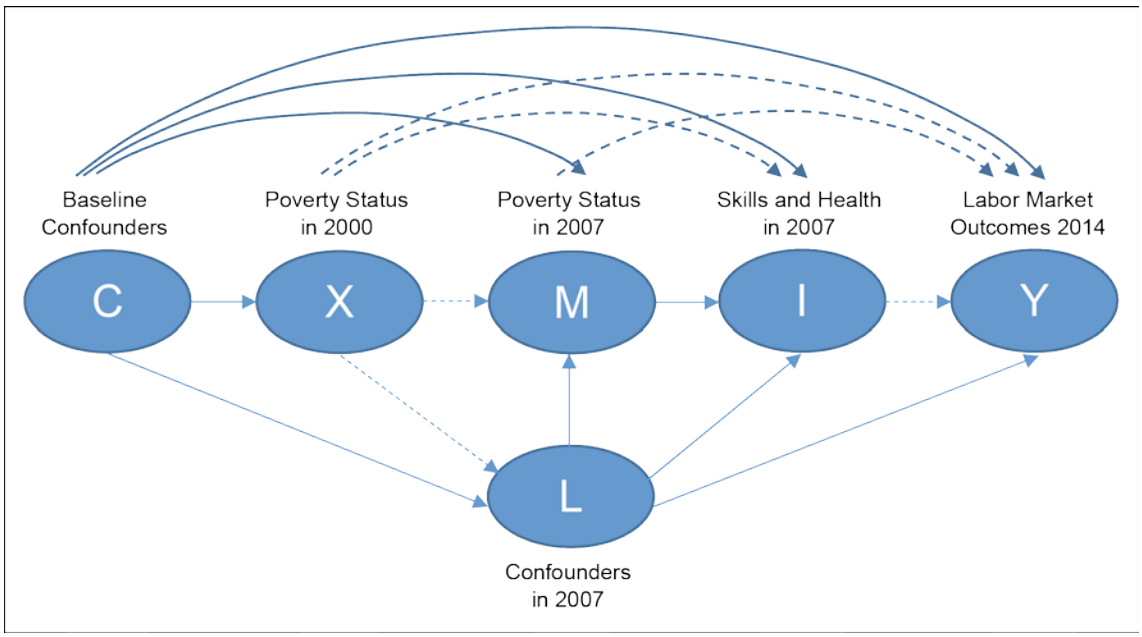
Source: Authors' calculation using IFLS data.

4. ESTIMATION STRATEGY

The strategy to estimate the long-term effect of childhood poverty relies on the directed acyclic graph which was used by Maika et al. (2017) to decompose the effect of early-life poverty (at age < 7 years) and poverty in later childhood (at age 7–14 years) on cognitive ability at age 7–14 years. The estimation shows that being poor before the age of seven years had a larger direct effect on child cognitive function at age 7–14 years than the indirect effects mediated through later poverty at age 7–14 years and school attendance/home environment at age 7–14 years. However, the direct effect was small and both interventions during early life and later childhood seemed equally important. The mechanism by which poverty under the age of seven affects cognitive function was largely mediated through schooling/home environment and subsequent childhood poverty at age 7–14 years rather than through poverty at age 7–14 years alone. This supports the argument that family financial resources contribute to children's developmental outcomes through direct parental investments of time and attention and through expenditure on children's skills, health, and education.

Our strategy used an extension of the directed acyclic graph by Maika et al. (2017) to represent the associations between confounders, exposure, mediators, and outcomes (Figure 3). Assuming there is no unmeasured confounder the graph shows that exposure to poverty in 2000 (X) has a direct effect on individual's hourly wage in 2014 (Y). The path from X to Y is potentially mediated by poverty in 2007 (M) and human capital during adulthood, which is the child's cognitive/math's skills and health (I). In addition, schooling/home environment (L) is a mediator-outcome confounder, which is also affected by the exposure, opening a potential path from X→L→Y in addition to X→M→Y and X→I→Y.

Figure 3: Possible Associations between Baseline Confounders, Poverty in 2000 and 2007, Home Environment, Cognitive/Math Skills and Health Function, and Labor Market Outcomes (22–31 Years Old)



Dashed arrows represent causal pathways; solid arrows represent biasing pathways.

The magnitude of associations along all paths between X, M, I, L, and Y were characterized using regression analysis. Given that the focus is on the effect of growing up poor in 2000 on the labor market outcomes in 2014, the main sample consists of children aged 8–17 years old who were poor in 2000 while the comparison group consists of those who were not poor in 2000. The base econometric specification is shown in Equation (1):

$$\ln hourlywage_{i2014} = \beta_0 + \beta_1 poor_{i2000} + \beta_2 X_i + e_i \quad (1)$$

where the dependent variable is the child's hourly wage (in natural logarithmic form) in market work in 2014 (Y). The main independent variable is $poor_{i2000}$, the child's exposure to poverty in 2000, which is equal to one if they lived in a poor family and zero otherwise. X_i is a vector of covariates consisting of child and household characteristics, which include age, gender, location, parental education, household size etc. in 2000, 2007, and 2014.

Figure 3 shows that there are mediators (poverty status in 2007, cognitive/math's skills and health, and schooling/home environment) induced by the exposure. In this case, the hypothesis is that the extent of a family's financial resources in 2000 could plausibly influence whether a child was exposed to poverty in 2007, possessed low skills and health, or living in a poor home environment. Due to these mediators, Equation (1) becomes:

$$\ln hourlywage_{i2014} = \beta_0 + \beta_1 poor_{i2000} + \beta_2 poor_{i2007} + \beta_3 humcap_{i2007} + \beta_4 X_i + u_i \quad (2)$$

where $poor_{i2007}$ child's exposure to poverty in 2007, $humcap_{i2007}$ the human capital development in the aspects of education or health (mathematics/cognitive skills or lung capacity), and X_i the vector of covariates of home environment are now included in the model. Table 2 provides summary statistics for the variables used in this paper.

Table 2: Summary Statistics

	Full Sample			Poor in 2000			Not Poor in 2000			
Variables	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	p-Value
Hourly wage, 2014 (ln)	1,522	9.01	1.04	263	8.69	1.04	1,259	9.07	1.03	***
Child in 2007:										
Poor (=1)	1,522	0.05	0.21	263	0.13	0.34	1,259	0.03	0.17	***
Cognitive score (0–12)	1,522	6.33	1.67	263	5.83	1.88	1,259	6.43	1.61	***
Math's score (0–5)	1,522	2.49	1.59	263	2.03	1.43	1,259	2.58	1.61	***
Schooling (years)	1,522	9.83	3.74	263	8.39	3.48	1,259	10.13	3.72	***
Lung capacity (l/min)	1,522	357.91	100.55	263	348.35	99.51	1,259	359.91	100.69	*
Age in 2014	1,522	27.07	2.58	263	26.79	2.60	1,259	27.12	2.57	*
Male (=1)	1,522	0.61	0.49	263	0.65	0.48	1,259	0.60	0.49	*
Urban (=1)	1,522	0.70	0.46	263	0.64	0.48	1,259	0.71	0.46	**
Mother in 2000:										
No schooling (=1)	1,522	0.46	0.50	263	0.68	0.47	1,259	0.41	0.49	***
Elementary (=1)	1,522	0.29	0.45	263	0.27	0.44	1,259	0.30	0.46	No
Junior high (=1)	1,522	0.11	0.31	263	0.04	0.19	1,259	0.12	0.33	***
Senior high (=1)	1,522	0.11	0.31	263	0.02	0.12	1,259	0.12	0.33	***
Diploma (=1)	1,522	0.03	0.18	263	0.00	0.00	1,259	0.04	0.19	***
University (=1)	1,522	0.01	0.08	263	0.00	0.00	1,259	0.01	0.09	No
Work (=1)	1,522	0.65	0.48	263	0.62	0.49	1,259	0.65	0.48	No
Household in 2000:										
Household size	1,522	5.58	1.92	263	6.32	2.10	1,259	5.43	1.85	***
Electricity (=1)	1,522	0.92	0.28	263	0.85	0.36	1,259	0.93	0.25	***
Safe drinking (=1)	1,522	0.88	0.32	263	0.86	0.34	1,259	0.88	0.32	No
Improved sanitation (=1)	1,522	0.45	0.50	263	0.24	0.43	1,259	0.50	0.50	***
Modern cook fuel (=1)	1,522	0.11	0.31	263	0.02	0.14	1,259	0.13	0.34	***
Television (=1)	1,522	0.67	0.47	263	0.37	0.48	1,259	0.73	0.44	***

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.1 Instrument

As is already widely discussed in the literature on poverty, using Ordinary Least Squares (OLS) on Equations (1) or (2) usually produces biased estimates. Linking poverty and its impacts require further efforts to convince readers that they have a causal relationship (Mayer 1997; Duncan and Brooks-Gunn 1997). They might reveal correlations but poor families usually have a worse home environment or other characteristics that the researchers do not observe. Some studies used fixed-effects estimation to control for biases caused by permanent family or child characteristics (Blau 1999; Duncan et al. 1998; Levy and Duncan 1999; Blanden and Gregg 2004). A second set of studies used instrumental variables to control for endogenous transitory shocks (Shea 2000; Chevalier et al. 2005; Black et al. 2005; Oreopoulos et al. 2008).

In this paper, we opted for the second line of research that used instrumental variables to create variation on income. This is because, although permanent characteristics were removed in fixed-effect strategies, they might still suffer from severe attenuation bias since income is measured noisily (Dahl and Lochner 2012). Therefore, we construct an instrument for poverty flows in the agricultural sector during 1997 to 2000. This instrument is adapted from Bartik (1991) and defined as "shift-share" (or "enclave-based"). In this context, the instrument aims at isolating supply-driven changes in the proportion of poor in agriculture.

The crisis in 1997/1998 is used as a natural experiment to create poverty variability in the agricultural sector across the provinces in the sample. Almost 70% of the total poor population had their household heads working in the agricultural sector (Suryahadi et al. 2009). The poverty rate in this sector was also much higher than other sectors, both in urban and rural areas, and in the periods before and after the crisis. In terms of employment, this sector made up more than half of total employment in Indonesia. This was also the only sector that experienced an increase in labor force participation because the crisis induced a shift of workers from urban services to rural agriculture (Feridhanusetyawan 1999).

To create a proxy for agricultural-driven growth in the proportion of poor in agriculture, let us define z_{ijt^0} as the share of poor people in agriculture (j) in province i at time t^0 or 1997, and g_{jt} as the national growth in agriculture at time t or 2000. The expected inflow rate of poor people in agriculture p_{it} is therefore a weighted average of the national growth rate in agriculture (the "shift"), with weights that depend on the distribution of earlier poor people at time t^0 (the "shares"). This proxy will be defined as:

$$p_{it} = z_{ijt^0} g_{jt}$$

The main identification idea is to use the fact that shocks to poverty are exogenous to local conditions in the province. These local conditions are reflected in the proportion of poor in the agricultural sector and that it interacted with the national growth in the agricultural sector. The instrument was used to control for regional variation of poverty following the 1997/1998 Indonesian economic crisis. A substantial effect in the proportion of poor in the agricultural sector brought by the crisis would create income variation among low- and high-income families, and this has no correlation with parental abilities and other factors potentially affecting children's outcomes.

There are two conditions in order for the shift-share in the agricultural sector during the crisis to become a valid instrument. First, it must be relevant or have a statistical relationship with the endogenous poverty status. Secondly, it must not have a direct causal relationship with the dependent variables or be correlated with the residuals in Equations (1) or (2).

The results of the relevance test are displayed in Table 3 Columns (1)–(3). Actually, testing for the relevance of the instrument is the first-stage regression in the two-stage least square (2SLS) estimation. There is a positive and statistically significant correlation between the instrument and poverty status, which means that a shifting in the share of poverty in the agricultural sector matters for the child poverty status in 2000. This correlation remains after we control for individual and household characteristics.

Table 3: Relevance of Instrument and Exclusion of Restrictions, OLS

	Poverty Status in 2000 (Poor=1)			Hourly Wage in 2014 (ln)		
	(1)	(2)	(3)	(4)	(5)	(6)
Shift-share instrument in agriculture	0.0008***	0.0006***	0.0005***	1.861	1.141	2.061
	(0.00026)	(0.00026)	(0.00025)	(2.689)	(2.677)	(2.736)
Age		−0.0117***	−0.00819**		0.0201**	0.0155
		(0.00375)	(0.00358)		(0.0101)	(0.0103)
Male (=1)		0.0239	0.0183		0.289***	0.296***
		(0.0190)	(0.0184)		(0.0537)	(0.0535)
Urban (=1)		−0.00805	0.00709		0.285***	0.229***
		(0.0221)	(0.0214)		(0.0613)	(0.0626)
Constant	0.133***	0.546***	0.353***	9.021***	7.954***	7.909***
	(0.0159)	(0.106)	(0.113)	(0.0321)	(0.279)	(0.304)
Additional controls	No	No	Yes	No	No	Yes
Obs.	1,522	1,522	1,522	1,522	1,522	1,522
Adjusted R-squared	0.00549	0.0683	0.15	0.000345	0.0904	0.113

Additional controls include baseline confounders in 2000: mother's characteristics, household size, access to electricity, safe drinking water, improved sanitation and cooking fuel, and television.

Standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Although fundamentally untestable, we also test for the exclusion restriction to make sure that the shifting in the share of poverty in the agricultural sector is unlikely to have a direct correlation with the dependent variable, hourly wage in 2014. The results show that the instrumental variable has no statistically significant effects on hourly wage. This implies that the shift-share instrument satisfies the exclusion restriction condition.

5. EFFECT OF GROWING UP POOR ON LABOR MARKET OUTCOMES

We provide the OLS and 2SLS estimation results of Equation (1) in Table 4. The sign and the significance level of the poverty status in 2000 variable remains the same in both the OLS and 2SLS estimation results, even after controlling for other variables. The difference is in the magnitude of the coefficients. Based on the OLS estimation, a child who lived in a poor family in 2000 earns 19% (=exp(–0.211)–1 x 100%) less than one who did not live in a poor family. The coefficient is considerably higher when the 2SLS is used for the estimation, in that a child who lived in a poor family in 2000 earns 87% (=exp(–2.071)–1 x 100%) less than one who did not. The first-stage F-statistics for the 2SLS estimation reflects that the instrument is strong enough (F-stat=14.737 or more than 10) when the full controls are taken into account (Table 4, Column (6)).

Table 4: Effect of Growing Up Poor on Labor Market Outcomes

	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty status in 2000 (poor=1)	−0.383***	−0.260***	−0.211***	−2.747**	-2.765**	−2.071**
	(0.0705)	(0.0712)	(0.0762)	(1.261)	(1.648)	(1.028)
Age		0.0170*	0.0138		−0.0117	−0.000991
		(0.0101)	(0.0102)		(0.0229)	(0.0168)
Male (=1)		0.296***	0.301***		0.356***	0.336***
		(0.0535)	(0.0533)		(0.0796)	(0.0676)
Urban (=1)		0.278***	0.224***		0.258***	0.239***
		(0.0594)	(0.0611)		(0.0827)	(0.0740)
Region:						
Sumatera		0.101	0.125*		−0.1095	−0.2536
		(0.0671)	(0.0703)		(0.1411)	(0.2947)
Kalimantan, NTB, Sulawesi		−0.123	−0.15*		−0.1271	−0.1256
		(0.0768)	(0.0768)		(0.1306)	(0.1295)
Constant	9.074***	8.118***	8.018***	9.483***	9.552***	8.721***
	(0.0291)	(0.281)	(0.305)	(0.218)	(1.006)	(0.682)
Additional controls	No	No	Yes	No	No	Yes
Obs.	1,522	1,522	1,522	1,522	1,522	1,522
Adjusted R-Squared	0.0192	0.0986	0.118	.	.	.
First-stage F-statistics	–	–	–	8.228	14.901	14.737

Additional controls include baseline confounders in 2000 and 2007: mother's characteristics, household size, access to electricity, safe drinking water, improved sanitation and cooking fuel, and television.

Standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Using panel data from the Korean Labor and Income Panel Study, Cho and Heshmati (2015) showed that those who had been less fortunate during their childhood had a reduction of about 15 percentage points in wages, on average, compared to those from a middle class background. This effect is 4% lower than our OLS result. This made sense since we used a 14 year span of data while the Korean study only used ten years of panel data. Meanwhile, a study by Mani et al. (2018) in Indonesia shows that those who have a severe physical limitation worked 19% less hours than those without a severe physical limitation. This reflects that the effect of growing up poor on labor market outcomes is similar to the effect of having a severe physical limitation or being unable to complete at least one of activity of daily living, such as standing up from a sitting position without help. This effect is large since our observations are those of younger cohorts and that the poverty was experienced during childhood while the severe physical limitation was experienced in adulthood.

When we take into account the mediators (poverty status in 2007, cognitive/ mathematics skills, years of schooling, and average lung capacity), the OLS estimation shows a slight difference (Table 5, Columns (1)–(3)). The range of the decrease in hourly wage for a child who lived in a poor family in 2000 lies between 16–17 percentage points for the OLS result. This effect is slightly lower compared to the previous effect when we do not include the mediators in the OLS estimation (19%).

Table 5: Effect of Growing Up Poor and Human Capital on Labor Market Outcomes

	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty status in 2000 (poor=1)	−0.181**	−0.185**	−0.177**	−2.371**	−2.468**	−1.912**
	(0.0760)	(0.0768)	(0.0772)	(1.582)	(1.681)	(1.705)
Poverty status in 2007 (poor=1)	−0.107	−0.125	−0.139	0.359	0.375	0.240
	(0.133)	(0.130)	(0.133)	(0.387)	(0.416)	(0.410)
Cognitive score, standardized	0.105***			0.0608***		
	(0.0267)			(0.0455)		
Math's score, standardized		0.141***			0.115***	
		(0.0268)			(0.0392)	
Schooling (years)			0.0299			0.0188
			(0.00824)			(0.0142)
Avg. lung capacity, standardized	0.0224	0.0115	0.0216	−0.0241	−0.0362	−0.0147
	(0.0354)	(0.0353)	(0.0354)	(0.0540)	(0.0554)	(0.0522)
Age	0.0141	0.0167	0.00595	−0.000875	0.000998	−0.00295
	(0.0104)	(0.0104)	(0.0106)	(0.0167)	(0.0174)	(0.0149)
Male (=1)	0.257***	0.319***	0.280***	0.367***	0.421***	0.359***
	(0.0734)	(0.0731)	(0.0735)	(0.116)	(0.114)	(0.110)
Urban (=1)	0.215***	0.201***	0.214***	0.244***	0.232***	0.238***
	(0.0607)	(0.0607)	(0.0606)	(0.0793)	(0.0813)	(0.0744)
Region:						
Sumatera		0.1302*	0.1089		−0.273	−0.2714
		(0.0695)	(0.0706)		(0.3292)	(0.3363)
Kalimantan, NTB, Sulawesi		−0.1009	−0.1561**		−0.0915	−0.1257
		(0.0771)	(0.076)		(0.134)	(0.1358)
Constant	8.096***	8.037***	8.013***	8.774***	8.759***	8.580***
	(0.317)	(0.318)	(0.318)	(0.639)	(0.677)	(0.673)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,522	1,522	1,522	1,522	1,522	1,522
Adjusted R-squared	0.128	0.135	0.129	.	.	.
First-stage F-statistics	–	–	–	14.959	14.598	13.651

Additional controls include baseline confounders in 2000 and 2007: mother's characteristics, household size, access to electricity, safe drinking water, improved sanitation and cooking fuel, and television.

Standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Our effect does not change much when we use instrumental variable specification and include the mediators in the estimation (Table 6, Columns (4)–(6)). A child who lived in a poor family in 2000 earns 85–92% less than one who did not live in a poor family. This effect is similar to previous effects when we do not take into account the mediators (87%).

Among the mediators, only cognitive and mathematics skills are positively associated with hourly wage (Table 5, Columns (4)–(6)). A one standard deviation increase in cognitive or mathematics score implies an increase of equal to 6% and 12% in hourly wage, respectively. This reflects that the effect of mathematics skill on labor market outcomes is worth about twice that of the cognitive skill effect.

6. SOCIOECONOMIC STATUS BASED ON EXPENDITURE DISTRIBUTION

One may argue that a measure of socioeconomic status cannot rely on poverty status only. In this paper, poverty status is defined based on a national standard line that distinguishes those who are considered as poor and not poor. However, we lack information on what the distribution really looks like. To check for what happened with those in a certain sample distribution, we divided the per capita expenditure (variable used to measure poverty status) into five ranking groups where each group consists of a consistent number of observations based on an ordered per capita expenditure. Therefore, if there are 1,522 observations in the sample, there will be five groups consisting of around 304 observations ordered by their per capita expenditure. The first group consists of 304 observations with the lowest per capita expenditure (Quintile 1), followed by the second lowest, and up to the highest 20th of per capita expenditure distribution (Quintile 5).

Table 6: Effect of Growing Up Poor and Socioeconomic Status on Labor Market Outcomes

	2SLS					
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty status in 2000 (poor=1)	−2.071**					
	(1.528)					
Lowest 20th (quintile 1=1)		−1.583**				
		(0.744)				
Second fifth (quintile 2=1)			−2.370*			
			(1.304)			
Third fifth (quintile 3=1)				2.501		
				(1.551)		
Fourth fifth (quintile 4=1)					3.102	
					(1.747)	
Highest 20th (quintile 5=1)						1.522**
						(0.735)
Age	−0.000991	0.0135	−0.0113	0.0133	0.0610	−0.000092
	(0.0168)	(0.0106)	(0.0286)	(0.0115)	(0.0373)	(0.0160)
Male (=1)	0.336***	0.330***	0.251***	0.255***	0.356***	0.358***
	(0.0676)	(0.0585)	(0.0886)	(0.0657)	(0.0769)	(0.0742)
Urban (=1)	0.239***	0.205***	0.241***	0.225***	−0.165***	0.163*
	(0.0740)	(0.0652)	(0.0926)	(0.0675)	(0.0859)	(0.0851)
Region:						
Sumatera	−0.2536	0.00987	0.181*	−0.0897	0.2190	0.201**
	(0.2947)	(0.0974)	(0.0968)	(0.181)	(0.0927)	(0.0810)
Kalimantan, NTB, Sulawesi	−0.1256	−0.151*	−0.0608	−0.210*	−0.1345	−0.0774
	(0.1295)	(0.0845)	(0.117)	(0.112)	(0.1063)	(0.0909)
Constant	8.721***	8.408***	8.714***	7.445***	7.421***	7.834***
	(0.682)	(0.409)	(0.606)	(0.506)	(0.419)	(0.338)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,522	1,522	1,522	1,522	1,522	1,522
Adjusted R-squared	–	–	–	–	–	–
First-stage F-statistics	14.737	17.386	12.2	9.14	14.901	15.644

Additional controls include baseline confounders in 2000 and 2007: mother's characteristics, household size, access to electricity, safe drinking water, improved sanitation and cooking fuel, and television.

Standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6 shows how the effect of children's socioeconomic status in 2000 – based on the quintile distribution – differs from each other. Surprisingly, those who are in the second quintile suffer the most, with an effect of having an hourly wage of 91% (=exp(–2.370)–1 x 100%) less than those who are not in the second quintile. Those growing up in the lowest 20th of per capita expenditure distribution have a 79% (=exp(–1.538)–1 x 100%) earnings penalty compared with those who did not belong to that group. A counter argument for this unstable result among the lower distributions might be that those in the second quintile are the vulnerable who move from a year of non-poverty to a year of poverty. This movement causes them to be more psychologically affected than those who experience their second year of poverty (Lesner 2017). Finally, the richest children or those who are living in the highest 20th earn 78% more than those who are not the richest.

7. POSSIBLE MECHANISMS

At this stage, we have shown that children who lived in a poor family in 2000 earn less than their counterparts. The next task is to find the channel that mediates the effect. We come with several mediators ranging from later poverty status (in 2007), human capital including cognitive and mathematics skills and years of schooling, lung capacity, information on how the individuals get the jobs, and the mental health aspects measured by the Center for Epidemiologic Studies Depression Scale (CES-D) score on depressive symptoms.

We find that the direct effect of poverty status in 2000 remains even after removing the effect of the above channels. This could be an indication that the direct effect of poverty during childhood on earnings as adults is large and no single channel could offset it (Table 7). This indicates that growing up poor makes a difference to labor market outcomes. Children from low-income families earn less in part because they are poorer, not just because they have lower skills and live in a less conducive schooling/home environment. As McKnight (2015) pointed out, becoming high earners in later adult life is not simply due to different levels of ability, since children from low-income families who have better skills appear to be less successful. There remains an unexplained additional advantage associated with higher social class background.

Table 7: Effect of Growing Up Poor and Human Capital on Labor Market Outcomes after Removing the Effect of Mechanisms, OLS

	Hourly Wage in 2014 (ln)						
Possible Mechanisms	**Poverty Status in 2007** **(1)**	**Cognitive Score in 2007** **(2)**	**Math's Score in 2007** **(3)**	**Years of Schooling in 2007** **(4)**	**Lung Capacity in 2007** **(5)**	**Getting the Job through Relatives** **(6)**	**Depressive Symptoms Score in 2007** **(7)**
Poverty status in 2000	−0.193**	−0.185**	−0.189**	−0.178**	−0.202**	−0.203**	−0.205**
	(0.0825)	(0.079)	(0.0798)	(0.0807)	(0.0803)	(0.0804)	(0.0804)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,522	1,522	1,522	1,522	1,522	1,522	1,522
Replications	500	500	500	500	500	500	500

Additional controls include confounders in 2000 and 2007: mother's characteristics, household size, access to electricity, safe drinking water, improved sanitation and cooking fuel, and television.

Standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Effect of Growing Up Poor and Human Capital on Labor Market Outcomes by Government Transfer, OLS

	Hourly Wage in 2014 (ln)					
	(1)	(2)	(3)	(4)	(5)	(6)
Poverty status in 2000 (poor=1)	−0.168**	−0.173**	−0.166**	−0.154**	−0.159**	−0.153**
	(0.0767)	(0.0774)	(0.0779)	(0.0760)	(0.0768)	(0.0772)
Poverty status in 2007 (poor=1)	−0.0671	−0.0860	−0.0996	−0.0370	−0.0567	−0.0709
	(0.135)	(0.132)	(0.135)	(0.135)	(0.132)	(0.135)
Cognitive score, standardized	0.104***			0.104***		
	(0.0266)			(0.0265)		
Math's score, standardized		0.139***			0.137***	
		(0.0268)			(0.0266)	
Schooling (years)			0.0290***			0.0282***
			(0.00821)			(0.00820)
Avg. lung capacity, standardized	0.0190	0.00835	0.0183	0.0207	0.0102	0.0202
	(0.0355)	(0.0354)	(0.0356)	(0.0354)	(0.0353)	(0.0354)
Age	0.0125	0.0151	0.00460	0.00981	0.0124	0.00212
	(0.0104)	(0.0104)	(0.0105)	(0.0104)	(0.0104)	(0.0105)
Male (=1)	0.268***	0.329***	0.290***	0.265***	0.325***	0.286***
	(0.0733)	(0.0729)	(0.0735)	(0.0731)	(0.0727)	(0.0733)
Urban (=1)	0.221***	0.207***	0.220***	0.203***	0.190***	0.203***
	(0.0611)	(0.0611)	(0.0611)	(0.0608)	(0.0608)	(0.0608)
Receiving:						
BLT in 2007 (=1)	−0.172**	−0.167**	−0.166**			
	(0.0686)	(0.0687)	(0.0687)			
Rice for the poor in 2007 (=1)				−0.263***	–0.257***	–0.255***
				(0.0558)	(0.0557)	(0.0557)
Cash/Rice for poor in 2000 (=1)	0.0907	0.0764	0.0735	0.0855	0.0714	0.0686
	(0.128)	(0.128)	(0.128)	(0.125)	(0.126)	(0.126)
Constant	8.194***	8.133***	8.111***	8.349***	8.286***	8.263***
	(0.319)	(0.319)	(0.320)	(0.319)	(0.320)	(0.320)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,522	1,522	1,522	1,522	1,522	1,522
Adjusted R-squared	0.132	0.139	0.133	0.141	0.147	0.141

Additional controls include baseline confounders in 2000 and 2007: mother's characteristics, household size, access to electricity, safe drinking water, improved sanitation and cooking fuel, and television.

Standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

We also looked at the effect when we controlled for several government transfers. Given the data period used in this paper, we were able to include the variable of whether household of the children receive the unconditional cash transfer (BLT) and rice for the poor (Raskin) programs. BLT served as a temporary protection by providing just-in-time cash assistance to poor households affected by an economic shock. Raskin, on the other hand, provided monthly rice consumption needs at subsidized prices, leaving poor households additional income to spend on other budget items. BLT and Raskin share a

similar characteristic of government transfers that can achieve national coverage very rapidly. They also deliver universally usable benefits to address acute consumption difficulties immediately after crisis or policy changes.

The magnitude effect of child poverty on hourly wage decreased as we controlled for BLT and Raskin programs (Table 8). Similar with other mediators, we did not find any evidence that receiving these programs mediates the effect of growing up poor on earnings as adults. However, the Indonesian government have implemented programs aimed at breaking the intergenerational cycle of poverty. The program is called Program Keluarga Harapan (PKH). It is a conditional cash transfer program aimed at poor households. The size of the transfer is about 15%–20% of annual household expenditure. The conditions include ensuring school-age children in the household go to school, pregnant women conduct regular checks, and children under six years get complete immunization. Cahyadi et al. (2018) evaluated the PKH program in an RCT setting six years after implementation. They found large effects on the usage of trained healthcare professionals during childbirth. The program also halves the share of children not enrolled in school. Considering our sample, we need data with a longer time frame to analyze the long-term effect of PKH.

8. CONCLUSION

This paper investigates the long-term impact of living in a poor family during childhood on adult labor market outcomes. We used hourly wage as the measure of income earnings. Our instrumental variables estimation shows that a child who lived in a poor family when aged between eight and 17 years old suffers an 87% earnings penalty relative to a child who did not grow up in a poor family. The magnitude effect on labor market outcomes is similar to individuals who have a severe physical limitation in adulthood. Those who are in the second quintile suffer the most. However, the direct effect remains large after we account for a large set of mediators. Depending on the set of mediators that we use, we estimate an earnings penalty between 85% and 90%. Similarly, we did not find any evidence that receiving various government transfer programs mediates the effect of growing up poor on earnings as adults. However, the Indonesian government have implemented programs aimed at breaking the intergenerational cycle of poverty, called PKH. Whether the PKH could have long-term benefits is an important future research area.

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