Household Income, Joint Work-Schooling and Human Capital in Indonesia

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This paper uses a natural experiment with IV estimation to investigate the influence of household income on joint work-schooling behavior for Indonesian children, 6 – 15. Child labor is studied in terms of i) work within the household and schooling ii) work outside the household and schooling and iii) hours worked outside and schooling. Children choose from different schooling types – formal education, non-formal school for child workers and home schooling. The results show that income shifts the child towards more work and less schooling. But income has a negligible effect on the number of hours of wage work. From age 12 onwards, children especially boys transition from work in the household to work outside the household and to wage work that is likely to separate them from the family. But interruptions to human capital accumulation and separation from the family are less likely if the child is home schooled.

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1. Introduction

This empirical paper studies the phenomenon of joint child work-schooling decisions in Indonesia from the view of human capital theory. Productive skills are developed in childhood for generating future returns. Human capital can be accumulated not just by attending formal schooling but also through informal schooling such as learning skills from the family. In Indonesia the national labor force starts at age 10 and this consists of economically active children who have either never attended school or who combine work with schooling. For children who are in the labor force while simultaneously attending school, this raises the question as to the extent that the child's labor supply affects the amount of time available to develop skills. To address this, consideration has to be given to the timing of schooling, whether this timing conflicts with work and the extent of this conflict. If there is conflict this arises from the joint work-schooling decision that is influenced by whether the child's income augments household income and possibly the social norms towards children working.

This paper studies Indonesian child workers aged 6 – 15 who simultaneously attend school. Two questions are asked. 1) Does a reduction in parental income change simultaneous work-schooling behavior? 2) If yes, do these changes impair human capital accumulation? In this paper, I view child labor in terms of economic work and unpaid household production / domestic work and I use the terms schooling and skill formation interchangeably. I sequence the behavior of simultaneous work-schooling as a child who first works and then second attends school. As child labor and school decisions are joint outcomes out of a single time allocation problem, I analyze the joint decision-making by studying the children's types of work and learning activities in and outside of the household and time allocated to these activities.

Using the Indonesian education system which recognizes the phenomenon of child labor and provides skill development alternatives for child workers, I study three sources of skill formation. The first is the formal and mainstream system of primary school and junior high. The second is non-formal school which consists of alternatives to the mainstream system that target child workers. Educational service delivery for non-formal schooling includes the use of privately managed religious schools; learning time is flexibly built around the child's working time. The third is informal school which consists of the provision of independent

study modules to complement the skills acquired from education within the home. Households that typically have informal schooling are parents who are traders or entrepreneurs and have children who act as apprentices. Apart from skill development, children who work in the household should face fewer safety and health risks compared to children working outside without parental supervision or monitoring.

In the literature on household income and child labor, Basu, Das, and Dutta (2007) provide a discussion on child labor responses to variations in household income. These responses include whether the child shifts from work within the household to work outside the household. Work within the household is more likely if the household has its own business as discussed by Edmonds and Turk (2004) for Vietnamese households. In the overwhelming majority of cases, the work performed by children takes place within the household – usually household chores and work on the family farm (Basu and Ray, 2002). Wage work and work in small enterprises which take place outside the household remains an exception (ILO, 2002). The UNICEF definition of child labor reflects the distinction made between working outside and in the household as well as recognizing that the intensity of child labor is higher when the child is older[1]. In Asia, a further distinction is made where child labor is primarily regarded as an urban as opposed to rural phenomenon (Fafchamps and Wahba, 2006). However it is unclear whether the activities carried out in the household necessarily constitute child labor if the child is an apprentice in the family enterprise, building skills through on-the-job learning. If there is skill development then the time allocated to household production does not impair human capital accumulation. Work and learning activity can then occur concurrently.

The rest of the paper is organized in the following way. In Section 2 I describe national level child labor trends in Indonesia and how this changed over the period of the financial crisis. In Section 3 I describe the components of the national education system that have been designed to promote an alternative education for child workers. Section 4 describes the natural experiment and a description of the dataset, the RAND Corporation Indonesia Family Life Surveys (IFLS). Limitations arising from the observed data i.e. child labor as the dependent variable is a censored variable (Basu et al, 2007) are discussed. Section 5 details the child and

[1] UNICEF definition of child labor: children aged 5 – 11 who work at least 1 hour of economic work or 28 hours of domestic work per week; children aged 12 – 14 who work at least 14 hours of economic work or 28 hours of domestic work per week

household characteristics associated with work-schooling behavior which we use for our estimations. Section 6 reports the results. Conclusions are in Section 7.

2. National Child Labor and Schooling Trends

The Asian Financial Crisis (AFC) occurred at the end of 1997 with effects in the financial markets felt until the beginning of 2000. For the household, much of the impact of the aggregate shock was felt in the 52.16 percentage point or eightfold increase in inflation rates from 1997 to 1998. With reference to Table 1, annual inflation rates increased from 6.23% in 1997 to 58.39% in 1998 and then improving to 20.49% in 1999 before resuming a considerably lower rate of 3.72% in 2000. Inflation rates were then less substantial in 1999. The significant increases in inflation rates for the two years 1998 and 1999 compared to 1997 and 2000 severely weakened household purchasing power of all goods including education.

In terms of schooling indicators, between 1997 and 1998[2] the percentage of 13-19 year olds that were not currently enrolled in school rose. The percentage not enrolled increased more in urban centers - from 33 percent in 1997 to 38 percent in 1998, a change that is statistically significant. Children from poorer households in general were more likely to be out of school than children from better off households — a phenomenon that intensified between 1997 and 1998. The change is also reflected in drop-out rates. Younger children were less likely to be in school in 1998 as well. This is especially true for the poorest. The percentage of 7 - 12 year olds in the bottom quartile of the distribution of per capita expenditure that were not enrolled implying delayed starting in school doubled, from about 6% in 1997 to about 12% in 1998. But based on an empirical investigation carried out by Cameron (2001) in Indonesia declines in schooling do not appear to be accompanied by a rise in formal employment amongst children.

In terms of the occurrence of child labor, the Indonesian Census Bureau of Statistics, BPS national labor force surveys SAKERNAS show that at least 1% of children starting from age 5 to 9 are economically active (SAKERNAS 1998; Asra et al 1995 and 1997). However detailed information is not available for this age group. Using SAKERNAS, available data shows that the percentage and absolute number of economically active children in Indonesia becomes noticeable when the child is aged 10 onwards. With reference to Figure 4, it can be

[2] World Bank Indonesia Statistics

seen that there is a trend where there are children who simultaneously work and attend school. While children at age 10 are less inclined to work while attending school, the time series in Figure 4 shows that for each additional year of aging up to 17, the percentage that reports working full time increases and inversely the percentage that reports combining work with schooling decreases. Within this age range of 10 – 17, it can be seen that at the legal minimum employment age of 15, 0.7% of the children work and within this age group 0.2% points or 71% of them attend school and the remaining 29% work full time. The relationship between working and schooling changes further when the individual is aged 17 where 0.3% of all those aged 17 work. Within this group, 0.5% points or 40% attend school while the remaining 60% work full time. As such these national labor survey trends suggest that as child workers become older, they attend school less and work more or leave school completely and work full time.

According to SAKERNAS, child labor is a naturally occurring trend that is gradually shifting away from rural areas to urban centers. Possible explanations for this have been offered by Pardoen et al (1996). First, as the contribution of the agricultural sector to the gross domestic product has become smaller over time, employment opportunities in rural areas have become fewer. Second, the informal sector in urban, economic growth centers tends to attract unskilled laborers like children in the age group of 10 – 14 and this is prior to the child reaching the legal employment age of 15 where labor laws can afford protection to the child. Also when comparing urban employment with rural employment opportunities, it has been reported that the urban informal sector provides higher and more stable incomes for child workers. Particularly over the period of the financial crisis, Imawan (1999) documented that in urban centers the number of working children rose from 1% to 1.5% in the period of August 1997 to December 1998. Although the majority of the children observed in this period still worked in the agricultural sector (64.4%), it is reported that 14.7% worked in the manufacturing sector and 20.9% worked in the services sector which includes street children who will provide services for a fee (BPS, 1998).

The gradual shift from the primary (agricultural) sector to secondary (manufacturing) and tertiary (services) sectors has also gradually reduced the number who work for less than 24 hours a week (Pardoen et al, 1996). This is associated with children shifting from non-wage employment to wage employment. Non-wage employment tends to occur when the child is engaged in work in the household such as family farm production or home production /

domestic work. As a result, their working status as classified by BPS and SAKERNAS as changing from unpaid family workers to laborers is when they shift from non-wage employment to wage employment. With reference to the publicly available BPS household survey SUSENAS 2000 as detailed in Table 2, the working status of children can be defined as being i) self employed without family assistance ii) self-employed with family assistance iii) self-employed with non-family assistance iv) paid worker and v) unpaid worker in the family. For definitions i) to iii), the child worker may or may not receive a wage. Definitions i) and ii) when contrasted against iii) suggests recognition that the child worker faces higher safety and health risks without the presence of the family. From Table 2, it can be seen that the vast majority of child workers are unpaid workers in the family located in rural areas. Also both female and male child workers tend to be unpaid workers in the family.

The labor surveys also show that the proportion of male children who are economically active has tended to rise over time (SAKERNAS 1998 – 1993, Pardoen et al, 1996). However, according to Irwanto et al (2001) the national level trends may be under-reporting the incidence of girls working. This is because they tend to engage in home production / domestic production for the family and are not remunerated.

3. Alternative Education for Child Workers

Primary school consists of six grades and junior high school has three grades. In the formal and secular school system, these two levels are administered by the Ministry of National Education (MONE). Table 3 provides a description of the formal school curriculum structured by academic hours per week which we will use later to analyze time allocation patterns. At the end of the primary school level there standardized achievement tests that enable transition to junior high. This standardized achievement tests are known as EBTANAS.

For disadvantaged children who have fewer educational opportunities, the education system provides two alternatives to the formal or mainstream system. As can be seen in Figure 3, this alternative education is known as out-of-school education and consists of i) the non-formal school and ii) the informal school / family education.

The non-formal school system consists of equivalency educational programs and vocational training programs provided by non-governmental organizations. Private religious schools

funded from charitable contributions are also included in the non-formal system. Children who attend non-formal schools do not sit for EBTANAS. As a substitute they take the primary school level or junior high level equivalency tests which are set at a lower level than EBTANAS. The timing of taking the equivalency tests is independent of the child's school age. This means that the child can sit for the primary school equivalency tests even though s / he is older than the school age of 7 – 12. Likewise the child can sit for the junior high equivalency tests even though s / he is older than the school age of 13 – 15. Because of the structure of equivalency tests in the national education system, one of the tradeoffs for the child choosing this source of skill formation is the s / he falls behind children of the same school age in the formal system. Another tradeoff is that the child forgoes the EBTANAS credential for entering the labor market. This is unless the child enters the formal system and starts the education process from the beginning at grade 1.

The informal school is a source of skill formation that is derived from education or skill development in the home. This includes apprenticeships, learning-on-the-job or home production / domestic work. Children from informal schools also do not sit for EBTANAS. However like children attending religious schools, they sit for the equivalency tests. Children who make this schooling choice experience different tradeoffs from children in non-formal schools. On the one hand, these children are developing productive skills within the family business or trade and these skills may also have private returns in the economy. The acquisition of such skills is consistent with Becker's theory of human capital accumulation. On the other hand the tradeoff is that these skills may be valued in the economy as unskilled or low skilled wages in comparison to the premium that skilled wages receive in the labor market. However the wage premium for skilled labor in the economy is dependent on the characteristics and relationships of the formal and informal sectors in Indonesia. Another tradeoff of skill acquisition from the informal school is that if parents perceive a higher value from the children working and learning within the family business, their children will spend more time in the household and be less inclined to allocate time for attending school.

4. Empirical Strategy & Data

My research design is a natural experiment where I exploit the timing of the RAND Corporation Indonesia Family Life Surveys (IFLS) wave 2 (1997) and wave 3 (2000) to identify an exogenous source of variation in income - the Asian Financial Crisis. This instrument enables me to study the variations to simultaneous work-schooling behavior.

I define child work as i) a child aged 6 – 15 who works outside the household and may or may not receive a wage and ii) a child aged 6 – 15 who works in the household and does not receive a wage. I define schooling in terms of the three sources of skill formation – formal, non-formal and informal. I have the two definitions for work outside and in the household which follows from the analytical model by Edmonds (2008) and the generalized child labor model by Cigno and Rosati (2005). Both models imply that for most children the return to time for work in the household (household production) is at least as large as the value the family places on the child's wage contribution from working outside the household. These two labor definitions are also operationally similar to the UNICEF definition of child labor and the information that I have concerning the work status of children as defined in Table 2 particularly that the vast majority of children are unpaid workers in the household. Work activities in the household include participating in the family enterprise, farming, home production and domestic work. I only consider the age range of 6 – 15 because children in the formal education system start basic education either at end of age 6 or beginning age 7 and complete their education at the end of age 14. Starting age 15, the child can legally enter the labor market.

There are three different specifications for the dependent variable, child labor for its response to a reduction in household income. This is because I would like to capture different dimensions of child labor to prevent understating the magnitude of child labor. Also these specifications enable me to study the dynamics of child time allocation between work and learning activity. Using these specifications, I explore i) the changes to the shift between work activity and schooling activity, ii) changes between working outside the household and within the household; and iii) if the child works outside the household, changes to the number of hours worked per week. I match the children in the 1997 wave and the 2000 wave using the same household characteristics, child characteristics and schooling type / source of skill formation. These characteristics and how they relate to my two research questions are detailed in Section 5. Only biological parent – child relationships are considered. The estimates for child labor are then specified in the following reduced form:

$$y_{it} = \alpha_0 + \beta_1 m_{it} + \beta_2 c_{it} + \beta_3 s_i + \beta_4 f_t + \varepsilon_{it} \qquad \ldots(1)$$

where y_{ic} is the dependent variable with three different specifications for work by child *i* i) if child works and attends school then 1 and if child attends school full time then 0,
ii) if child works outside the household and attends schools then 1 but if child works in the household and attends school then 0 and
iii) if child works outside the household and attends school, the number of hours worked per week; m_{it} represents household characteristics that vary before and after the financial crisis – income and educational expenditures; c_{it} captures child characteristics over time *t*; s_i is a dummy variable that represents each of the three schooling types / sources of skill formation and f_t is a dummy variable for the financial crisis.

Since I can only observe child and household behavior in 1997 and 2000, it is acknowledged that I cannot observe anything spread across 1998 and 1999 given data unavailability; this is where there is severe unpredictability in behavior. Consequently, I carry out instrumental variable estimation to isolate the relationship between parental income and simultaneous work-schooling behavior. The IV approach is used to manage the omitted variable bias problem that is faced from not being able to observe child and household behavior over the period of 1998 and 1999 as well as to enable a discussion of alternative explanations for variations in child labor. As the instrument I use is the financial crisis, this instrument works through the value of child time where the variation in child labor is owing to the family's need for the child's contribution to household income or the relative return to work rather than school. This is written as equation (2) where the endogenous explanatory variable income m_{it} is a linear function of the exogenous variable the AFC z_4, a dummy variable and an error term.

$$m_{it} = \pi_0 + \pi_1 z_1 + \pi_2 z_2 + \pi_3 z_3 + \pi_4 z_4 + \upsilon_{it} \qquad \ldots(2)$$

I run OLS and IV regressions using the three different specifications for the dependent variable. An alternative method considered would have been a multinomial logit (MNL). But I do not choose this alternative because I am unable to determine or order the hierarchy of choices for MNL. In the first restricted sample, the dependent variable consists of both children who combine work with school or who combine zero work with school full time. In the second restricted sample, the dependent variable consists of both children who work

outside the household or in the household and gain a skill from one of the schooling types – formal, non-formal and informal. Children who attend school full time are not included in this second restricted sample. The size for the second sample is larger than for the first sample because in the data there are more children who demonstrate the behavior of work combined with schooling compared to children attend school full time. In the third restricted sample, I then proceed to focus only on children who work outside the household who report the number of hours worked while simultaneously attending one of the school types. This is because in IFLS waves 2 and 3 only children who work outside the household report the number of hours worked. The sample size becomes substantially smaller which then inevitably reduces the power of the analysis. However by comparing the direction and magnitude of the relationship between the main variables of interest using all 3 samples, I will have more information for analysis and interpretation.

A limitation of IFLS which is unavoidable and I account for this in my empirical strategy is the possibility of household break-up in longitudinal study designs. This limitation arguably cannot simply be explained away in terms of attrition. As explained by Rosenzweig and Foster (2001)[3] this design problem stems in part from the relative absence of attention in the theoretical and empirical literature to the determination of household structure. I try to address this problem by looking at the data in terms of household splitting. That is, there may be children who out-migrate for employment reasons. But none of the children aged 6 – 15 report leaving the household to start a new household in another area.

5. Child and Household Characteristics in Work-Schooling Behavior

The allocation of child time is an important component of a household's decision-making process. The household must weigh the value of child time spent in many activities including schooling, wage work, work inside the household, and work in household chores or other components of household production. The value of child time in any of these activities depends on both child and household attributes. In this section I consider how observable child and household characteristics are associated with the degree to which household income is improved over the period of the financial crisis. To do this I carry out semi-parametric estimation and I assume a normal distribution.

[3] This is also based on a very helpful discussion with Mark Rosenzweig

To capture child characteristics I use the variables gender, age and schooling type or source of skill formation. But there is a limitation where there is no data available on the type of work activity that the child carries out outside the household or in the household. As detailed in Section 3, these are the characteristics that are associated with the value of child time. National level trends show that boys tend to work outside the household and this work can be waged or non-waged. Wage work can be valued in terms of hourly wages or a fixed wage for a given amount of work. In contrast girls tend to work in the household or also known as attending informal school, primarily in farming, home production or domestic work which is unremunerated. It is then difficult to monetize the value of their work and how it improves family welfare. It is also difficult to measure the number of hours girls allocate to work because there is no incentive to determine the monetary value of an hour's work. Because of these intrinsic differences in how the work effort of boys and girls are viewed, there will also be differences in terms of how boys and girls shift more towards work and less towards schooling given joint work-schooling decisions. I capture these differences using the two definitions of child work – work outside the household and work in the household.

In terms of household characteristics, I focus on the variables annual total household income and household educational expenditures. Household income is proxied by household reported expenditures on all market valued goods and services. Educational expenditures consist of spending in the whole school year related to learning activity such as books, private tuition and transportation to school or the learning center. Because of the unanticipated reduction in household income, adjustments to household expenditures may necessitate reducing or foregoing educational expenditures entirely. However scholastically motivated parents may likely continue to allocate a proportion of the household budget to learning activity.

In relation to child and household attributes, I consider too the regional differences. This is because of the vastness of the country and its different socio-economic characteristics. To capture the regional differences, I use two variables – all households residing in Java and Bali Islands and households split by urban and rural in each of the main islands. With reference to Map 1, there is an urban / rural split and this is defined by BPS and government as a Java-Bali Islands / Outer Islands split. Because of modernization and consequently urbanization, Java and Bali Islands have attracted the majority of the population. Java and Bali based on BPS estimates in 2003 are home to 60% of the total country population but represent only 7%

of the total land mass in Indonesia. In contrast the Outer Islands are considered to have less industrialization, are less developed and have a lower population density.

5.1 Distribution of Time for Work and Schooling

I present the distribution of hours worked per week while attending school and one of the sources of skill formation. The kernel densities presented in Figures 4 – 6 represent child work outside of the household but not child work in the household. Based on the survey question asked in IFLS, children report on actual number of hours worked in the previous week and the hours reported do not reflect any other related activity such as travel time to work. Figure 4 presents children who work and attend the formal and mainstream education system where children in 1997 have a lower spread of hours per week compared to 2000. In 1997 there is a peak in the range of 0 – 20 hours but this peak disappears for in 2000. While the density is higher in the range of 0 – 30 hours in 1997 compared to 2000, this becomes different after 30 hours. The density is then higher in the range of 30 – 80 hours in 1997 compared to 2000. As such it can be seen from Figure 4, the children in 2000 work more hours a week than the children in 1997 while attending formal schooling. The total time allocation for work and at least 42 hours a week for classroom learning as dictated by the national curriculum for 11 – 15 year olds (see Table 3) is in the range of 72 hours – 142 hours a week in 2000. In contrast the total time allocation for joint work-schooling in 1997 is in the range of 42 hours – 72 hours a week for 11 – 15 year olds. The total time allocation is less for children aged 7 – 8 as the national curriculum requires a fewer 30 hours per week of classroom instruction. But classroom learning time increases to 38 hours for 9 year olds and 40 hours for 10 year olds.

Figure 5 presents child workers who attend Packet A and Packet B equivalency programs. The density of hours worked in 1997 peaks at 0 – 20 hours. In comparison, the distribution is further spread out in 2000 where children work from 20 – 80 hours after the financial crisis. However information on the total time allocated to work and skill formation is not available for this segment. This is because the equivalency programs are designed by the Ministry of Education in a flexible manner where the children can decide how much time to allocate for curriculum learning.

From Figure 6, it can be seen that children who work and attend informal school also known as education within the home have similar distributions as the children attending the other

two sources of skill formation. However the time allocated for work and the time allocated for skill development cannot be disentangled because it is most likely that both activities are synonymous. Both activities build productive skills as viewed by the family. As can be seen in Figure 6, the density in 1997 is in the range of 0 – 30 hours and is higher than 2000. This pattern reverses for the higher range of hours from 30 – 80 hours where the density in 2000 is higher than in 1997.

When studying these kernel densities, the caveat is that the distributions only represent children who work outside the household and this understates the full extent of child labor. The substantial increase in the number of hours worked per week in 2000 merits further investigation and this means exploring other dimensions of child labor which I do using the three specifications for child labor. How simultaneous work-schooling behavior changes given the different aspects of labor including hours worked is presented in Section 6.

5.2 The Relationship between Simultaneous Work-Schooling and Household Income

On the basis of Figures 4 – 6, it can be seen that child workers in 1997 worked a higher number of hours than in 1997. How does this pattern of increased working outside the household and in the household relate to household income? From Figure 7, it can be seen that as a result of the Asian Financial Crisis and the extreme inflation levels affecting purchasing power, household income (proxied by market value expenditures) in 2000 was severely reduced compared to 1997. The distribution of household income per capita in log terms shifted left from the range of slightly more than 12 log points – 22 log points to the range of less than 12 log points – 19 log points. The distributions show that higher income households in 2000 were more negatively affected by the crisis than the lowest income households. Also the spread of the income distribution becomes narrower in 2000 compared to 1997. By comparing Figures 4 – 6 that depict the distribution of simultaneous work-schooling by source of skill formation with Figure 7 that depicts income, it can be seen that children worked more hours per week when income fell.

Given these distributions from Figures 4 – 7, I pool the observations of child labor and their family's income for 1997 and 2000. Figure 8 presents the estimated fit between the two main variables where there is a slope that is nearly flat. This suggests that the contribution of child time for wage work to household income is minimal. It appears that a small proportion of child income is endogenous to household income which is generated by working outside the

household. This in turn implies that the time value of children working is higher in the household than the market value of working outside the household. This time value working in the household may also be reflected in the terms of child work viewed as skill formation.

5.3 Descriptive Statistics

With reference to Table 4 which provides information on working children and where they build their skills, I see that in both 1997 and 2000 a majority of the children attend informal school to learn independent courses to complement work for the family. The statistic is 77% in 1997 and 75% in 2000 which is in similar proportion. 20% in 1997 and 22% in 2000 work and attend the formal mainstream education system. 3% in 1997 as well as in 2000 work and attend non-formal school where the curriculum consists of an equivalency program designed to accommodate child workers who might then return to the mainstream system. These statistics are then disaggregated by the two definitions of children working outside the household and in the household. From Table 5, 51% in 1997 and a reduced 44% in 2000 who report working outside the household attend informal school. 41% in 1997 and an increased 51% in 2000 work and attend formal school. Exploring further this 10 percentage point difference, it is found that a higher proportion of older children in 2000 are attending formal junior high. 7% in 1997 and a slightly smaller 5% in 2000 outside the household and attend non-formal school. Proceeding to Table 6 which provides the statistics for children who work in the household, the pattern of the majority attending informal school is similar to that of children who work outside the household. 78% in 1997 and a similar proportion of 76% in 2000 work in the household and simultaneously build their skills within the home. 19% in 1997 and 21% in 2000 work in the household and attend the formal, mainstream system. For both periods, 3% work and attend non-formal school.

By exploring further the characteristics of the child and the household for those who work outside the household, it is observed in Table 7 that the children in 1997 report working an average of 22.19 hours per week. Also it is observed that the minimum number of hours worked per week is 2 hours and a maximum of 72 hours. Average household income per capita is 16.18 log points with a minimum of 14.20 log points and a maximum of 18.12 log points. Parents of children who work outside of the household invest on average 10.28 log points in educational spending. In 1997, 62% of the children are boys and 38% are girls. The majority at 70% of children are in rural areas and 60% are located in the Outer Islands where there is less economic development compared to Java and Bali Islands. Given the national

trend that child workers work more as they age (see Figure 2), the observed data shows that in 1997 children aged 6 – 9 make up a smaller percentage of child workers. Older children age 12 – 14 make up a higher proportion of workers.

In contrast, for the characteristics of the child and the household in 2000 it can be seen that the mean hours worked per week increased to 30.26 hours per week. Compared to 1997 this is an increase of 36% of hours worked per week. Also the range of hours worked has a far greater spread in 1997 to 2000. The minimum number of hours worked in 2000 is 1 hour and the maximum if 84 hours which raises the question whether the child workers are allocating more hours for work than what is possibly conceivable given the number of hours available in the day. The child workers in 2000 have on average a household income per capita of 13.69 log points which is lower than for the child workers in 1997. The reduction in average household income is 2.49 log points. Despite this severe reduction in income, parents in 2000 on average increased educational spending to 10.34 log points compared to 1997 at 10.28 log points (calculated in real terms using a self-constructed price deflator for education based on teacher wages). In 2000, the composition of girl and boy workers has changed compared to 1997. In 2000, girls make up 58% of workers and boys make up 42%. In terms of the urban / rural split, the majority of child workers in 2000 at 59% are from rural areas and this is similar in 1997. However like results from the SAKERNAS labor surveys, there is a shift towards child employment in urban centers in 2000 where the percentage of workers in the urban centers is a larger 41%. When looking at the incidence of child labor by islands, in 2000 63% of child workers are from Java and Bali. This pattern is the reverse of what is observed in 1997 before the financial crisis when the majority of child workers were in the Outer Islands. As there is more economic development in Java and Bali where there is a higher concentration of the tertiary services sector, the observed data appears to follow the national level trends of child work shifting away from the primary agricultural sector to the tertiary services sector. When looking at the age distribution of child workers in 1997 the pattern is similar to 2000 in terms of younger children ages 6 - 11. The pattern becomes different in 2000 for older children particularly aged 14 and 15 who work more instead of the spread of ages 12 – 15 as seen in 1997. The higher incidence of 15 year old children working in 2000 after the financial crisis coincides with the legal minimum age for employment in the country.

Proceeding to Table 8 which provides the descriptive statistics for child who work in the household, these children do not report the number of hours worked in IFLS. They only report that they do work and the work is for the family. The non-reporting of hours worked is most likely related to not having the need to recall hours worked because they do not receive hourly wages. In 1997, mean household income per capita is 11.27 log points and the range covers 8.79 – 16.65 log points. Mean educational expenditures is 10.55 log points with a minimum of 6.21 log points and a maximum of 16.65 log points. Mean household income and mean educational spending is slightly higher for children who work in the household compared to children who work outside the household. There is even split of girl and boy workers in 1997. Like children who work outside the household in 1997, the majority who work in the household at 56% are from rural areas. But 59% are located in Java and Bali and 41% are located in the Outer Islands. This is the reverse of children who work outside the household. In terms of the age distribution, the children ages 6 – 14 are evenly spread out in 1997 where there does not appear to be any difference whether a younger or older child works in the household. The slight exception is that a smaller percentage of 15 year olds work in the household.

As a comparison, in 2000 for children who work in the household, average household income per capita is higher than in 1997. After the crisis, average household income is 11.87 log points with a minimum of 9.86 log points and a maximum of 14.78 log points. However mean educational investments at 10.34 log points are lower in 2000 for children who work in the household compared to 1997. Also the range for educational investments has severely deteriorated after the crisis in terms of the minimum value is at a low of 1.39 log points. However the range has a greater spread compared to 1997 with the maximum value at a high of 13.21 log points. In terms of gender and the urban / rural split, there is the same pattern in both 1997 and 2000. The incidence of child labor in 2000 shows the same pattern as in 1997 in terms of the majority who work in the household being located in Java and Bali Islands. The age distribution for the children who work for the family in the 2000 remains the same as in 1997 including 15 year old children working less at home compared to the children aged 6 – 14.

6. Results

In Table 10, I present the results for the first sample that consists of children who work and attend school and children who do not work and only attend school full time. Full time schooling is in terms of any of the three sources of skill formation. In columns (i) and (ii) the regressions do not include the endogenous explanatory variables, schooling expenditures and schooling type. I find that the OLS estimate in (i) for household income per capita is negative and comparable in magnitude to the IV estimate in (ii). However the IV estimate is statistically significant at the 1% level and the OLS estimate is not significant. As expected when income is lower, the child combines work with schooling and does not attend school full time. Correspondingly, an increase in schooling related expenditures increases the likelihood that the child will attend school full time. However the effect of schooling expenditures on the child's work – schooling behavior is smaller than the effect of income. In columns (iii) and (iv) the coefficient size for schooling expenditures is smaller than for income. While the OLS estimate for these expenditures is statistically significant it is no longer the case for the IV estimate. In terms of the age effect, I find that across columns (i) to (iv), the older the child is, the higher the propensity for the child to work. This is similar to the national level trend highlighted in Figure 1. The OLS and IV estimates for age are similar in magnitude across the four columns and all are statistically significant at the 1% level. As the OLS and IV estimates are similar, there is very little bias. I also find that children who reside in urban centers have the propensity to attend school full time and not work. This is a statistically significant result across (i) to (iv) which is when the endogenous explanatory variables are not included and when included. I do not find any other significant results to explore further in terms of child attributes. This includes the gender of the child which suggests there is minimal bias whether a boy or a girl attends school full time or works full time. When I focus on the three sources of skill formation, I find that the provision of non-formal schooling by non-governmental organizations including religious schools increases the propensity of joint work-schooling. This is consistent with the design of non-formal schools for accommodating the skill development needs of child workers. However this result is not statistically significant. In contrast, when the source of skill development comes from the family, there is a positive relationship between attending school full time and not working. The OLS and IV estimates have similar coefficients and are statistically significant at the 5% level.

Next in Table 11, I change the specification of child labor and present the results for children who work outside the household combined with attending school and children who work in the household while attending school. The role of income in affecting child labor now changes. With income decreases the incidence of children working outside the household increases. The size of the income coefficient as reported by OLS and IV is similar to the size of the income coefficient when the dependent variable is specified as whether a child attends school full time (Table 10). However only the IV estimate is statistically significant and this is at the 5% level. Household investment in schooling as represented by schooling expenditures in columns (iii) and (iv) have the same relationship as income in terms of how it relates to child labor. With a fall in schooling expenditures, the incidence of children working outside the household increases. The OLS and IV estimates for spending are similar in magnitude and statistically significant. More importantly, the size of the coefficients for schooling expenditures is now larger than for household income. The significance of schooling expenditures when child labor is now specified in terms of working outside or within the household suggest that when parents choose to keep their children working in the home, there are likely to be elements of skill formation. As described in Section 3, children complement learning in the informal school with individual courses provided by the Ministry of Education. Parents can make these investments in their children when they are in the home enterprise but this may be less likely when the child works outside of the household for an employer.

In comparing the relationship between an income reduction and the incidence of joint work-schooling (Table 10) with the relationship between an income reduction and the incidence of working outside of the household (Table 11), decreases in income drive the shift towards joint work-schooling. But the reduction in income does not determine if the child will have a higher likelihood of working outside the household or in the household. This can be interpreted as a fall in income causes simultaneous work-schooling decisions but working can just as likely take place outside the household or in the household.

The relationship between the age of the child and the incidence of working is also borne out in Table 11 but now specifically in terms of an older child is more likely to work outside the household while attending school. This result is statistically significant at the 1% level. This finding is consistent with the intuition that when older the child is expected to be better equipped to manage the safety and health risks of working outside without parental

supervision. In Table 11, I now have a new result that I did not have from Table 10 which is related to the child's residential location. On the one hand residence in Java and Bali Islands does not play a substantial role in determining whether a child is in school or at work full time. But on the other hand, location becomes important for whether a child works outside the household or in the household. From Table 11, across columns (i) – (iv) it can be seen a child worker residing in Java and Bali Islands will work outside the household and attend school and this is statistically significant. This strongly suggests that there are more economic opportunities available in Java and Bali compared to the Outer Islands that have lower levels of economic development. As such when the child has to work, it is more likely that the child will work outside of the household because the relative returns will likely be higher than what is gained by working for the family in the household. I also find that the source of skill formation that now plays a noticeable role is non-governmental organization run schools for child laborers. This coefficient has a negative relationship with children working outside the household which can be interpreted as non-formal schooling reduces the incidence of working outside the household while attending school. This is consistent with the design and availability of this school type to accommodate the needs of child laborers. Schooling time is structured around the working hours of the child laborers so as not to deprive them of the opportunities for skill development. However the negative relationship between non-formal schooling and working outside the household is not statistically significant. The relationship between informal schooling and working outside the household is also negative and not statistically significant. However the size of the coefficient for informal school is smaller than for non-formal school. This implies that non-formal schools have a more important influence than informal schools in the skill development of children working outside of the household.

I now move to the specification of child labor in terms of the number of hours worked per week outside the household while attending school. The results can be seen in Table 12. Given the kernel densities from Figures 4 – 6, it was found that children in 1997 worked more hours per week while attending school compared to children in 2000. This raises the question of how much time is available for a child to work and to learn while contributing to household income. From column (i) in Table 12, the OLS estimate for income is positive and statistically significant at the 10% level. When household income decreases by one log point, a child works nearly four hours less per week. The IV estimate in column (ii) negates this relationship where when household income decreases by one log point, the child works one more hour per week. But this result is statistically insignificant. In comparing the OLS and IV

estimates, there is selection bias in the observed data where lower income households have children who work fewer hours outside the household. The different directions of the OLS and IV estimates for household income also hold in columns (iii) and (iv) when the endogenous explanatory variables are included. In terms of schooling expenditures, its effect on the number of hours worked outside the household is miniscule. This appears to be consistent with the findings in Table 11 when child labor is specified in terms of working outside or in the household. This implies that parents are less inclined to invest in the skill formation process when the child works outside for an employer.

As per the previous two specifications for the dependent variable, the OLS and IV estimates for age reinforce the finding that as the child is older, the incidence and intensity of child labor increases. The results across columns (i) – (iv) show that when the child is older by a year, the child works over three hours more per week. This is statistically significant at the 1% level. This strongly suggests that it is more the age of the child worker that shifts a child's time more towards work outside the household than variations in household income. In terms of geographical factors, I find that children in urban centers across all the main islands work on average four hours more per week and this is statistically significant at the 1% level. This result can be seen across columns (i) – (iv). The IV estimates are a half hour to an hour higher than the OLS estimates for each week of work and this is most likely due to attenuation bias.

Because of the statistically results from the age and urban center exogenous covariates, I now interact the two covariates and run the regressions from columns (v) – (viii) in Table 12. I now have different results for the main relationship of interest which is income and hours worked per week. The OLS estimates for income are positive and larger than for the IV estimates which mean that the OLS estimates are overstating the relationship between income and hours, due to omitted variables. Using the IV estimates from (vi) and (viii) and comparing them with the IV estimates from (ii) and (iv), it can be seen that when income decreases by one log point, the child works two hours more per week controlling for the child's age and urban location. This estimate is statistically significant at the 5% level. This finding also reflects the selection bias that lower income households have children who work fewer hours outside the household. When I study the interaction between age and urban center, I see that the IV estimates in (vi) and (viii) are slightly higher than the OLS estimates in (v) and (vii) which are likely to related to attenuation bias. It can be seen that when the child is older by a year and residing in an urban center, the child works thirty minutes more

per week and this finding is statistically significant at the 5% level. This interaction produces coefficient sizes that are noticeably smaller compared to the prior separate estimates on age and urban center in (i) – (iv). Another new finding from this additional specification can be seen in columns (vii) and (viii) where boys tend to spend more time outside the household working compared to girls. The OLS estimate is six additional hours of work per week, statistically significant at the 5% level and the IV estimate is at a lower 4.5 hours of more work per week statistically significant at the 10% level. This strongly implies that there is a gender bias where boys tend to work outside the household compared to girls and while working outside for a wage or an in-kind transfer, boys increase hours worked more than girls. However if the child worker is combining work outside with gaining skills from informal schooling, hours worked per week fall substantially. When schooling type as endogenous explanatory variables are included into the additional specification of the interaction of age and urban center, accounting for attenuation bias, the child works seven hours less per week. This finding can be seen in the IV estimate in column (viii) which is statistically significant at the 5% level. An interpretation for this finding is that the practice of the family enterprise with child apprenticeships downplays the need for the child's market income to complement household income when there is reduced income. The returns to work for the family appear to be higher than the returns to work in the market. In addition, by being an apprentice, the child's skill formation process continues and this is less likely when the child works outside the household.

7. Conclusions

This empirical paper has provided evidence on the variations in simultaneous work-schooling behavior when income falls. I used different operational definitions for the joint work-schooling decision: joint work and schooling, joint work within the household and schooling, joint work outside the household and schooling; and number of hours worked per week and schooling. A fall in income results in a shift away from full time schooling to joint work-schooling. An income decrease is also found to increase the propensity to shift away from schooling and towards more work for children who demonstrate joint work-schooling behavior. But it is not clear whether the increased incidence of working takes place outside or within the household. When isolating only child work behavior outside the household for wages or in-kind transfers, it is found that an income reduction increases the number of hours worked per week but the increase is small. A one log point decrease in income only increases work by 2 hours in a week which is not likely to conflict with time for schooling. To

reconcile these findings, a fall in income does increase the propensity of simultaneous work-schooling behavior. However this does not appear to be captured by the child's contribution to household income. Instead the reduction in income may be compensated by a higher relative value of child time used for work. As such, income does not appear to be the main influence for the incidence and intensity of child labor.

The main influence driving joint work-schooling is the age of the child. It is more likely that the child who already demonstrates simultaneous work-schooling behavior from an age as young as 6 is driven to work more when s/he is older. When the child is 12 years old, there is a higher propensity for the child to work outside the household while attending school. In addition this appears to be an urban phenomenon in Indonesia where wage opportunities are higher in areas with economic development. As the 12 year old child becomes older until s/he reaches the legal employment age of 15, the hours worked per week increase and there is a greater shift towards full time work. This strongly implies that if the child is in the formal school system in an urban center, the age range of 12 – 15 is where there is the highest risk that the child will fail to complete junior high. This then implies that human capital accumulation will peak at the completion of primary school at age 12.

This paper has also provided insight into the schooling choices of child workers – formal school, non-formal school or informal school. First, consider that the extent of child labor is arguably overstated if the child is an apprentice in the family enterprise where work and learning activity are occurring simultaneously. Hence both types of activity are the one and the same where work is carried out within the household. As there are productive skills built during the apprenticeship which provide social returns to the household, human capital accumulation does not appear to be impaired. The child's health and safety are also more likely to be assured as compare to the child working outside the household unsupervised by the parents. Second, it is also possible that the extent of child labor is likely to be understated because in this paper, a main limitation is that there is no data available on the types of activity carried out. Activities in the household that can be physically harmful or do not require any skills such as mundane, repetitive tasks are not observed in the data. As such the child who shifts more towards work and away from learning may be less likely to build human capital.

From the perspective of the national education system, the institutional recognition of both the informal school and non-formal school suggests that the relative value of time working outside or within the household is higher than schooling for some families. This then implies that in certain areas particularly urban centers, parents perceive that the returns to schooling are low. The presence and development of the informal school and non-formal school may then be an appropriate educational policy response to ensure that economically active children aged 6 – 15 are guaranteed some form of schooling. However another limitation of this paper is that there is no wage data available to assess to what extent the returns to schooling are lower than the returns to work outside or within the household.

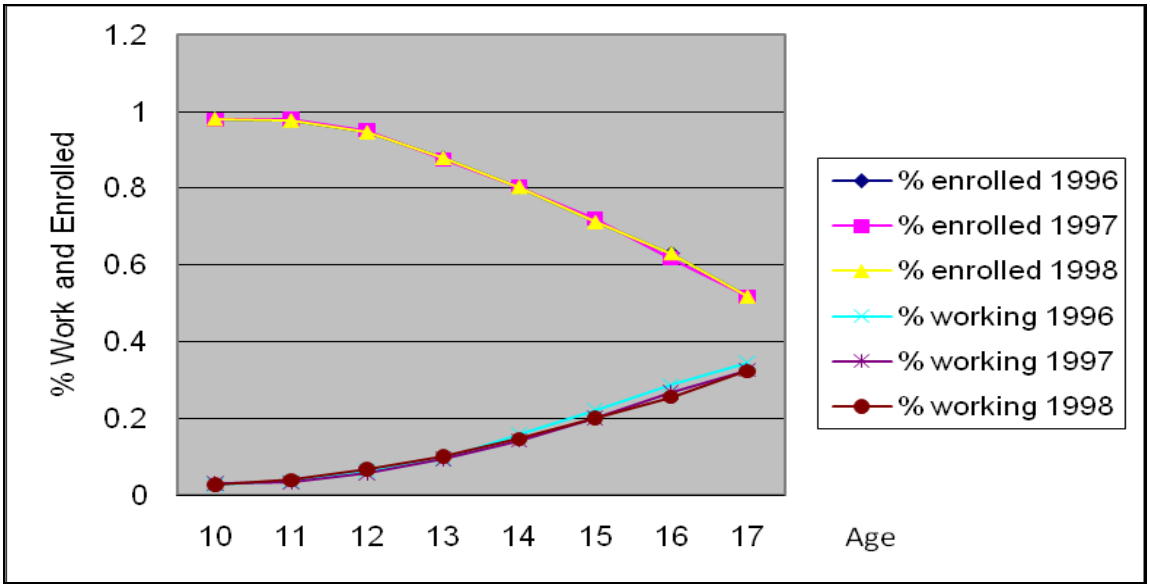
Appendix

Table 1 Indonesia Macroeconomic Variables Time Series 1997 – 2000

	1997	1998	1999	2000
GDP Growth (Annual %)	4.70	-13.13	0.79	4.92
GDP Per Capita Growth	3.27	-14.30	-0.55	3.55
Inflation, Consumer Prices (Annual %)	6.23	58.39	20.49	3.72
Real Interest Rates (%)	8.21	-24.60	11.83	8.05
Gross Domestic Savings (% GDP)	31.48	26.53	19.45	25.56
Foreign Aid (%GNI)	0.39	1.41	1.64	1.19

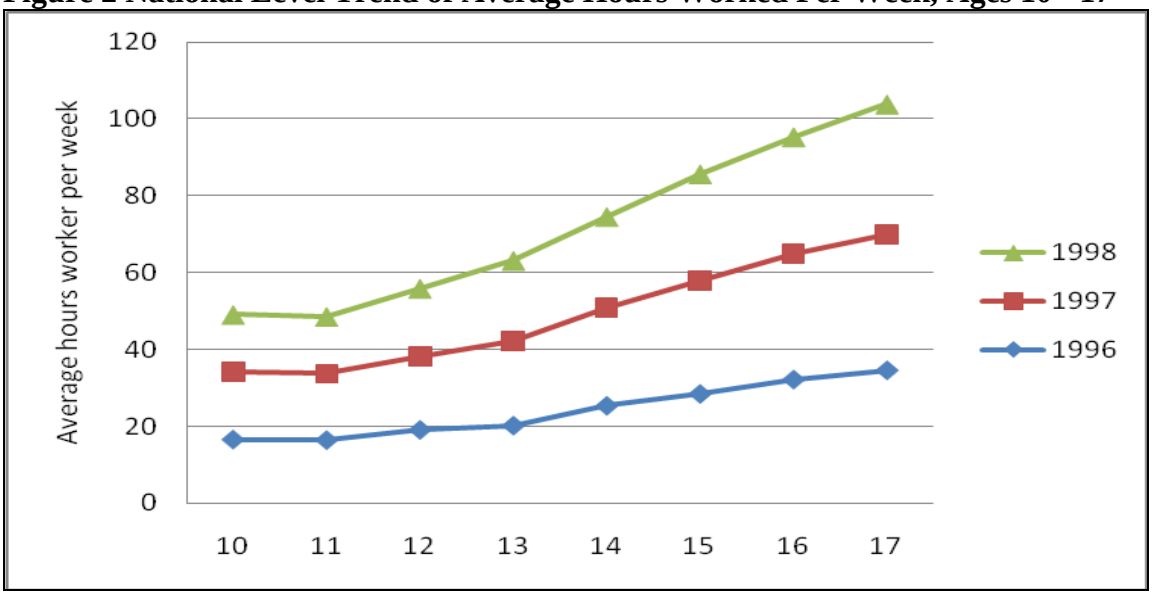
Sources: Development Research Institute, New York University; Global Development Finance, World Development Indicators

Figure 1 National Level Trend of Simultaneous Work – Schooling Behavior, Ages 10 - 17



Source: Census Bureau of Statistics BPS National Labor Force Surveys SAKERNAS
Notes: These national labor force surveys interview individuals who are economically active from age 10 onwards. The respondent is first asked if s / he is working and then asked if s / he is enrolled in school. Responses are then aggregated and reported by the age of the individual. The formula for calculating school enrollment is the individuals at age x are currently in school divided by all individuals aged x who have never been in school or or who have finished school. Illustration: individuals aged 10 make up a miniscule number who are economically active at a point in time and of this sub-group 1% are enrolled in school at the same point in time. In contrast individuals aged 17 make up 0.3% of all individuals who work at a given point in time and within this group 0.5% of all individuals are enrolled in school at the same point in time. Data is only available to the author for the period of 1996 – 1998.

Figure 2 National Level Trend of Average Hours Worked Per Week, Ages 10 - 17



Source: Census Bureau of Statistics BPS National Labor Force Surveys SAKERNAS
Notes: This figure shows the time series for the group of children who simultaneously work and attend school. This figure corresponds to the same sample of children from Figure 4. Data is only available to the author for the period of 1996 – 1998.

Table 2 Working Status of Children by Urban / Rural and Gender (% and Count is in Parentheses)

	Urban	Rural	Girl	Boy
Self-employed without family assistance (paid and unpaid)	9.4 (63)	5.7 (287)	5.0 (107)	6.8 (243)
Self-employed with family assistance (paid and unpaid)	3.9 (26)	4.0 (202)	3.6 (77)	4.2 (151)
Self-employed with non-family assistance (paid and unpaid)	0.3 (2)	0.2 (8)	0.6 (6)	0.4 (4)
Paid worker	32.1 (216)	7.5 (375)	12.3 (265)	9.2 (326)
Unpaid worker in the family	54.5 (366)	82.7 (4,160)	78.8 (1,693)	79.6 (2833)
Total	100 (673)	100 (5,032)	100 (2,143)	100 (2,889)

Source: Census Bureau of Statistics BPS Household Survey SUSENAS 2000.
Notes: Given restrictions on accessing data, this is the only nationally representative sample publicly available on child labor

Figure 3 Indonesian Education System

<table>
<tr><td>Age</td><td colspan="4">In-School Education</td><td colspan="3">Out-of-School Education</td></tr>
<tr><td></td><td colspan="4">Formal</td><td>Non Formal</td><td colspan="2">Informal</td></tr>
<tr><td>>22</td><td colspan="4">Higher Education / Religious Higher Education Post Grad</td><td></td><td rowspan="5">Courses</td><td rowspan="5">Family Education</td></tr>
<tr><td>19 - 22</td><td colspan="4">Higher Education / Religious Education Grad / Diploma</td><td></td></tr>
<tr><td rowspan="3">16 - 18</td><td colspan="4">Senior High</td><td rowspan="3">Apprenticeship Packet C (General or Religious School Provision)</td></tr>
<tr><td colspan="2">General</td><td colspan="2">Vocational</td></tr>
<tr><td>General</td><td>Religious Education</td><td>General</td><td>Religious Education</td></tr>
<tr><td rowspan="2">13 - 15</td><td colspan="4">Junior High</td><td rowspan="2">Junior High Equivalent Packet B (General or Religious School Provision)</td></tr>
<tr><td colspan="2">General</td><td colspan="2">Religious Education</td></tr>
<tr><td rowspan="2">7 - 12</td><td colspan="4">Primary School</td><td rowspan="2">Primary School Equivalent Packet A (General or Religious School Provision)</td></tr>
<tr><td colspan="2">General</td><td colspan="2">Religious Education</td></tr>
</table>

Source: Ministry of National Education

Table 3 Structure of Academic Hours for the National Curriculum by Primary School and Junior High School

		Primary School Grade						Junior High Grade		
	Subject	1	2	3	4	5	6	1	2	3
1	Pancasila Education	2	2	2	2	2	2	2	2	2
2	Religion	2	2	2	2	2	2	2	2	2
3	Indonesian Language	10	10	10	8	8	8	6	6	6
4	Math	10	10	10	8	8	8	6	6	6
5	Sciences	-	-	3	6	6	6	6	6	6
6	Social Sciences	-	-	3	5	5	5	6	6	6
7	Handicraft and Arts	2	2	2	2	2	2	2	2	2
8	Health and Sport	2	2	2	2	2	2	2	2	2
9	English	-	-	-	-	-	-	4	4	4
10	Local Indigenous Content	2	2	4	5	7	7	6	6	6
	Total	30	30	38	40	42	42	42	42	42
	School Age	6/7	8	9	10	11	12	13	14	15

Source: Ministry of National Education

Notes: This is a full description of the national curriculum structure by academic hours. We are unable to use this whole structure for the analysis of time allocation patterns because IFLS does not cover outcomes related to *Pancasila* education (the Suharto regime propaganda promoting unification and nationalism); handicraft and arts; health and sport; English language education and local content. According to the IFLS User Guide notes, the household surveys could not be designed in a manner that would be able to cover all these subjects that represent the diverse interests of the polyglot nation. But nonetheless this structure provides us with useful information concerning the average number of hours per week used for teaching the formal curriculum.

Figure 4
Kernel Density for Number of Hours Worked Per Weeks outside the Household and Attending Formal School

Figure 5
Kernel Density for Number of Hours Worked Per Weeks outside the Household and Attending Non-Formal School

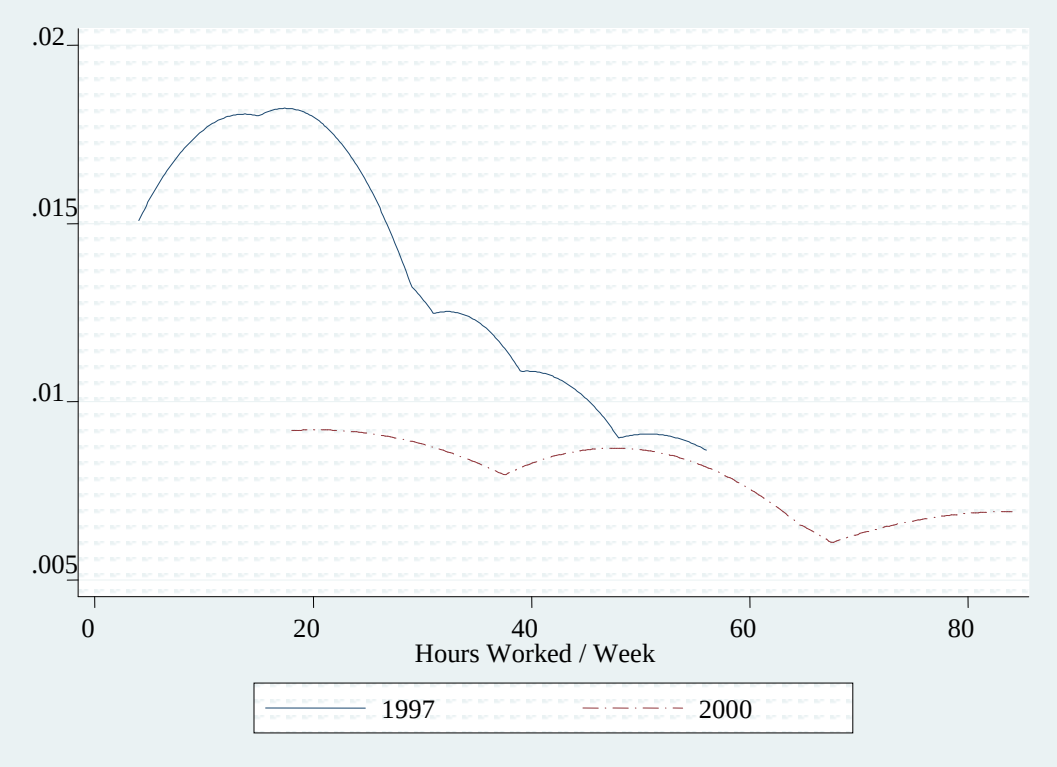


Figure 6
Kernel Density for Number of Hours Worked Per Weeks outside the Household and Attending Informal School

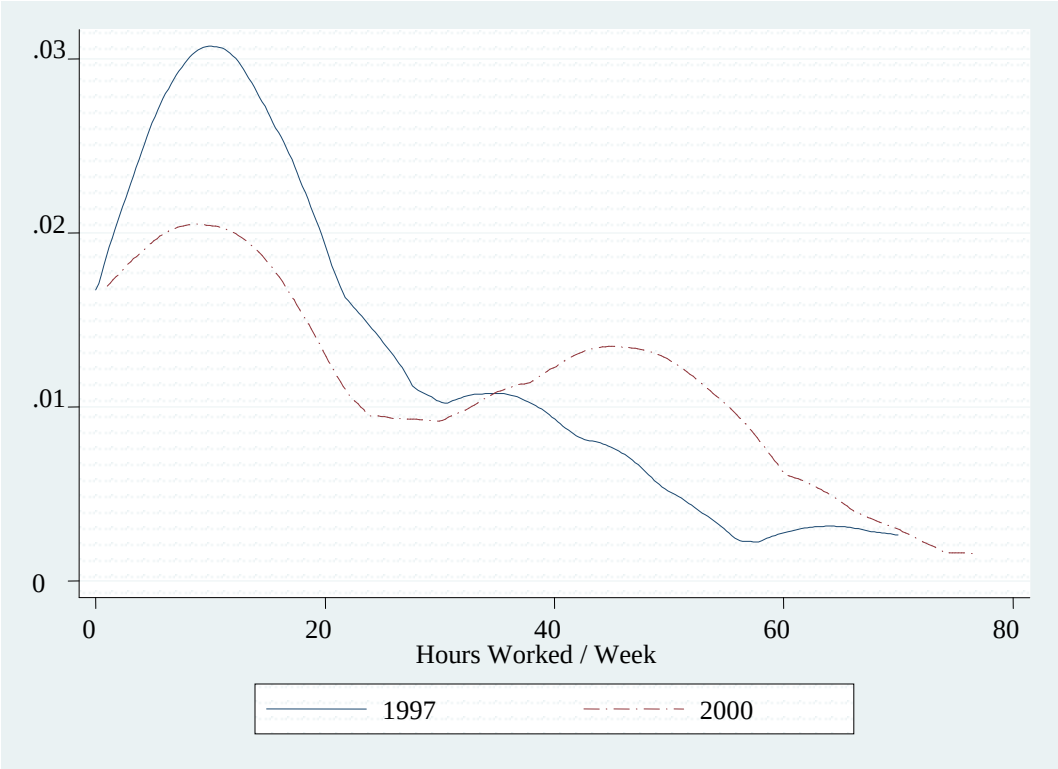


Figure 7 Distribution of Household Income

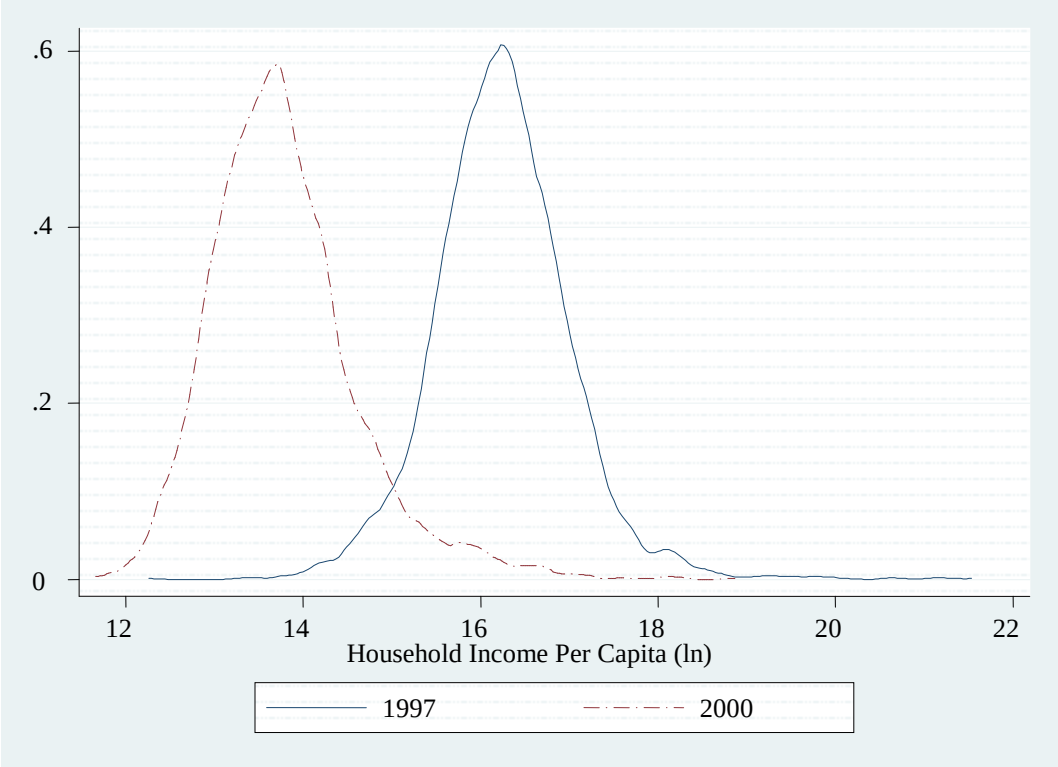


Figure 8 the Relationship between Child Labor and Household Income

Table 4
Children Working & Different Sources of Skill Formation

Number & Percentage of Children Attending Different Sources

	Before-Group	Percentage	After-Group	Percentage
Formal	1,638	0.20	1,616	0.22
Non-Formal	229	0.03	196	0.03
Informal	6,518	0.77	5,511	0.75
Observations	8,399		7,323	

Notes: This table provides statistics on children who report working for a wage outside the household and children who report working in the household which includes the family business or farm and home production / domestic production and they do not receive any wages. All children are reported as being registered in one school type / source of skill formation. I do not have comprehensive information concerning children deriving skills from more than one source or overlapping sources.

Table 5
Children Working outside the Household & Source of Skill Formation

Number & Percentage of Children

	1997	Percentage	2000	Percentage
Formal	50	0.41	85	0.51
Non-Formal	9	0.07	7	0.05
Informal	63	0.52	75	0.44
Observations	122		167	

Notes: This table provides statistics on only children in the observed data who report working outside the household and may or may not receive a wage.

Table 6
Children Working in the Household & Source of Skill Formation

Number & Percentage of Children

	1997	Percentage	2000	Percentage
Formal	1,588	0.19	1,531	0.21
Non-Formal	220	0.03	189	0.03
Informal	6,456	0.78	5,436	0.76
Observations	8,277		7,156	

Notes: This table provides statistics on only children in the observed data who report working in the household which includes the family business or farm and home production / domestic production and they do not receive any wages.

Table 7
Characteristics of Children Working outside the Household

1997

Variable		Mean	SD	Min	Max
Hours Worked / Week		22.19	17.68	2	72
Household Income (ln)		16.18	0.61	14.20	18.12
Educational Expenditures (ln)		10.28	0.84	7.71	11.98
		Percentage			
Girl		0.38			
Boy		0.62			
Urban		0.30			
Rural		0.70			
Java and Bali Islands		0.40			
Outer Islands		0.60			
Distribution by Age		Percentage			
	6	0			
	7	0.008			
	8	0.04			
	9	0.06			
	10	0.08			
	11	0.09			
	12	0.16			
	13	0.25			
	14	0.31			
	15	0			

Characteristics of Children Working outside the Household

2000

Variable		Mean	SD	Min	Max
Hours Worked / Week		30.26	23.04	1	84
Household Income (ln)		13.69	1.08	12.30	18.86
Educational Expenditures (ln)		10.34	0.89	1.39	13.21
		Percentage			
Girl		0.58			
Boy		0.42			
Urban		0.41			
Rural		0.59			
Java and Bali Islands		0.63			
Outer Islands		0.37			
Distribution by Age		Percentage			
	6	0			
	7	0.01			
	8	0			
	9	0.01			
	10	0.08			
	11	0.05			
	12	0.11			
	13	0.08			
	14	0.31			
	15	0.34			

Table 8
Characteristics of Children Working in the Household

1997

Variable		Mean	SD	Min	Max
Household Income (ln)		16.24	0.77	12.25	21.53
Educational Expenditures (ln)		10.55	0.87	6.21	12.68
		Percentage			
Girl		0.49			
Boy		0.51			
Urban		0.44			
Rural		0.56			
Java and Bali Islands		0.59			
Outer Islands		0.41			
Distribution by Age		Percentage			
	6	0.11			
	7	0.10			
	8	0.11			
	9	0.10			
	10	0.11			
	11	0.10			
	12	0.11			
	13	0.11			
	14	0.10			
	15	0.07			

Characteristics of Children Working in the Household

2000

Variable		Mean	SD	Min	Max
Household Income (ln)		13.78	0.82	11.66	18.16
Educational Expenditures (ln)		10.34	0.89	1.39	13.21
		Percentage			
Girl		0.50			
Boy		0.50			
Urban		0.39			
Rural		0.61			
Java and Bali Islands		0.75			
Outer Islands		0.25			
Distribution by Age		Percentage			
	6	0.08			
	7	0.11			
	8	0.11			
	9	0.10			
	10	0.11			
	11	0.11			
	12	0.10			
	13	0.11			
	14	0.10			
	15	0.05			

Notes: Respondents when asked if they work in the household which includes domestic production, the family business or the farm reported either Yes or No but they do not provide the number of hours per week used to carry out these activities in the household. As such this table only reports on children who have the status of working in the household and the household's total annual expenditures and annual educational expenditures.

Table 10

DV = Child Works and Attends School is 1
Otherwise Child Does Not Work, Child Attends School Fulltime is 0
(Robust SE is in Parentheses)

	(i) OLS	(ii) IV	(iii) OLS	(iv) IV
Household				
Income	-0.0030	-0.0288***	-0.0013	-0.027***
	(0.0021)	(0.0015)	(0.5850)	(0.0015)
Asian Financial Crisis	0.0624***		0.0628***	
	(0.0062)		(0.0066)	
Schooling Expenditures			-0.0093***	-0.0029
			(0.0024)	(0.0024)
Child				
Age	0.0144***	0.0145***	0.0122***	0.0119***
	(0.0007)	(0.0007)	(0.0009)	(0.0009)
Boy	0.0012	0.0013	-0.0001	0.0003
	(0.0034)	(0.0034)	(0.0036)	(0.0036)
Urban	-0.0217***	-0.0124***	-0.0163***	-0.0109**
	(0.0036)	(0.0034)	(0.0039)	(0.0039)
Java and Bali	0.0023	0.0031	0.0057	0.0044
	(0.0036)	(0.0036)	(0.0038)	(0.0038)
Schooling Type				
Non-Formal School			0.0216	0.0212
			(0.0195)	(0.0194)
Informal School			-0.0242**	-0.0279**
			(0.0082)	(0.0082)
Constant	-0.0737	0.3389	0.9635	0.5975
	(0.0353)	(0.0229)	(0.0446)	(0.0354)
R^2	0.06	0.05	0.06	0.06
Observations	14,338	14,338	13,145	13,145

Statistically significant at the *** 1%, ** 5% and * 10% level
Notes: The instrumental variable for income in (ii), (iv), (vi) and (viii) is the Asian Financial Crisis. In Table 10, the number of observations for children who attend one of the sources of skill formation full time and does not work is smaller than the observations in Table 11. In Table 11, there are more children observed with joint work-schooling behavior.

Table 11

DV = Child Works outside the Household and Attends School is 1,
Child Works in the Household and Attends School is 0
(Robust SE is in Parentheses)

	(i) OLS	(ii) IV	(iii) OLS	(iv) IV
Household				
Income	-0.0021	-0.0024**	-0.0011	-0.0022**
	(0.0015)	(0.0009)	(0.0017)	(0.0009)
Asian Financial Crisis	0.0009		0.0026	
	(0.0042)		(0.0045)	
Schooling Expenditures			-0.0047***	-0.0044**
			(0.0013)	(0.0013)
Child				
Age	0.0070***	0.0070**	0.0068***	0.0068***
	(0.0004)	(0.0004)	(0.0006)	(0.0006)
Boy	0.0006	0.0006	-0.0006	-0.0006
	(0.0021)	(0.0021)	(0.0021)	(0.0021)
Urban	-0.0038*	-0.0036	0.0024	0.0026
	(0.0023)	(0.0022)	(0.0025)	(0.0025)
Java and Bali	-0.0048**	-0.0048**	-0.0047*	-0.0047*
	(0.0024)	(0.0024)	(0.0026)	(0.0026)
Schooling Type				
Non-Formal School			-0.0147	-0.0147
			(0.0095)	(0.0095)
Informal School			-0.0022	-0.0023
			(0.0050)	(0.0050)
Constant	-0.0173	-0.0111	0.0192	0.0342
	(0.0256)	(0.0138)	(0.0290)	(0.0192)
R^2	0.02	0.02	0.02	0.02
Observations	15,780	15,780	14,151	14,151

Statistically significant at the *** 1%, ** 5% and * 10% level
Notes: The instrumental variable for income in (ii), (iv), (vi) and (viii) is the Asian Financial Crisis. In Table 11, the number of observations for children with joint-work schooling behavior is larger than the observations in Table 10. In Table 10, there are fewer children observed who attend school full time.

Table 12

DV = Hours Worked per Week by Child who Works Outside the Household and Attends School
(Robust SE is in the Parentheses)

	(i) OLS	(ii) IV	(iii) OLS	(iv) IV	(v) OLS	(vi) IV	(vii) OLS	(viii) IV
Household								
Income	3.8942*	-1.1584	4.7490**	-0.7716	4.3767**	-2.8036**	4.3481**	-2.1690**
	(1.4325)	(0.9115)	(1.6619)	(1.0492)	(1.4240)	(0.9315)	(1.6531)	(1.0133)
Asian Financial Crisis	13.2350*		14.1238**		18.4696***		16.9530**	
	(4.4960)		(5.1700)		(4.4740)		(5.1349)	
Educational Expenditures			-2.4292	-0.4769			-2.0781	0.1734
			(1.5806)	(1.6623)			(1.7007)	(1.7359)
Child								
Age	3.3777***	3.6226***	3.8610***	3.7045***				
	(0.5498)	(0.5570)	(0.7066)	(0.7468)				
Urban	4.5600*	5.5944**	4.3567*	4.8990*				
	(2.4285)	(2.5239)	(2.6236)	(2.6721)				
Boy	1.2854	0.1775	3.3175	2.2183	3.1432	1.7303	6.1470**	4.6857*
	(2.3503)	(2.3984)	(2.6302)	(2.6496)	(2.4033)	(2.4812)	(2.6569)	(2.7041)
Java and Bali	-0.7978	0.2939	2.4529	2.6115	0.2015	1.8755	2.7737	2.9772
	(2.3830)	(2.4183)	(2.7960)	(2.7878)	(2.4812)	(2.5524)	(2.8841)	(2.8905)
Age_Urban					0.4270**	0.5569**	0.4792**	0.5406**
					(0.1978)	(0.2083)	(0.2111)	(0.2140)
Schooling Type								
Non-Formal School			15.5007	16.1736			10.7181	11.6532
			(9.5063)	(10.4752)			(10.3714)	(11.4138)
Informal School			3.2484	1.2770			-5.6427**	-7.5099**
			(3.1050)	(3.1981)			(2.6598)	(2.6163)
Constant	-83.6161	-5.1189	-82.7386	-9.8121	-51.9938	63.6304	-30.1724	54.0313
	(23.9826)	(16.7404)	(28.4779)	(22.9103)	(23.0753	(14.3800)	(25.9993)	(19.4853)
R^2	0.16	0.12	0.20	0.15	0.09	0.002	0.14	0.07
Observations	290	290	252	252	290	290	252	252

Statistically significant at the *** 1%, ** 5% and * 10% level

Notes: Only children who work outside the household report the number of hours worked per week. The instrumental variable for income in (ii), (iv), (vi) and (viii) is the Asian Financial Crisis

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