

Child Labor and Economic Development

Handbook of Labor, Human Resources and Population Economics

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Abstract

218 million children work in the world today. 70 percent are in activities classified as child labor under local laws. While in policy circles child labor is often viewed as a rights issue, it is also an economic issue. Working children are both a cause and a consequence of a lack of economic development. Widespread child employment dampens future economic growth through its negative impact on child development and depresses current growth by reducing unskilled wages and discouraging the adoption of skill-intensive technologies. Child employment also appears to result from a lack of economic growth. Rising incomes are associated with improvements in the family's ability to triage economic shocks without child labor, shifts in production to outside of the home, and greater demand for education and leisure. These factors all lead to declines in the economic activity of children.

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Introduction

218 million children work in the world today, with 152 million classified as child laborers under local laws (ILO 2017). Historically, policy attention towards working children has focused on it as a human rights issue. The United Nations (UN) Sustainable Development Goals list the ending of child labor in all its forms as one of its measurable targets. Is there a place for attention to child labor in sustainable economic development? This essay reviews the literature on the interaction of child labor and economic growth and concludes that child labor is both a cause and a consequence of a lack of economic growth.

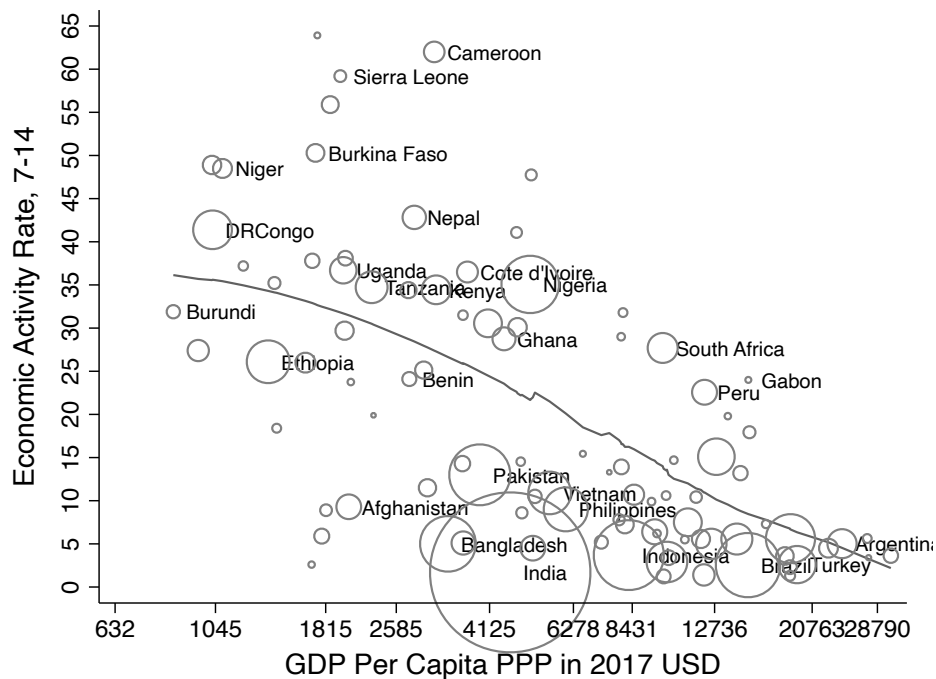


Figure 1: The Economic Activity of Children and National Income

Notes: Figure plots the fraction of children who are economically active between the ages of 7 and 14, inclusive, against gross domestic product per person adjusted for purchasing power parity and expressed in 2017 dollars. The size of each circle reflects the population of children under 15 in the country (larger circle = more children). The curve is a local kernel smoother. Source: World Development Indicators for most recent year with economic activity information available in each country, downloaded July 2020.

Figure 1 illustrates the close connection between child employment and national income. Policy generally distinguishes between child employment and child labor (work that is harmful or illegal under local laws), but national statistics and most academic research generally do not distinguish between the two. The figure contains a plot of the child employment rates in the *World*

Development Indicators (WDI) against gross domestic product per capita.¹ Each country is represented by a bubble with a size proportional to its population under 15. The curve pictures average child employment in countries across the national income spectrum. Wealthier countries have less child employment. More than half of the cross-country variance in child employment can be accounted for by differences in GDP per capita.²

In this essay, *economic growth* refers to the process by which poor countries grow richer. *Economic growth* is used interchangeably with economic development or progress, and, for this paper, does not refer to a transitory, short term burst in economic activity nor a long-run rate of economic expansion. The striking relationship in Figure 1 illustrates the interconnection of economic growth and child employment, but the figure does not depict a causal relationship. Figure 1 does not show what would happen to child employment if countries grew richer. It does not show that countries would grow if child employment was reduced. Countries differ in income and child employment for many reasons, and interactions between child labor and economic growth are complex. The existing literature shows that high levels of child employment impede economic development and that economic development leads to declines in child labor.

The impact of child employment on economic growth arises through two main channels: child development and local labor markets. Child employment impacts child development by interfering with schooling and physical and mental health. With a finite amount of time in the day, inevitable tradeoffs exist between work and school time. There is also evidence of both physical and mental health consequences of working as a child that arise in adulthood. Although popular opinion seems to hold that some work experiences are advantageous for children, the academic literature has not documented this, finding that even common work experiences can be harmful. The impact of child employment on child development has long term consequences as it impacts the capacity of the next generation of adults. There is compelling evidence of intergenerational persistence: child laborers become adults with children who are also child laborers.

The impact of child employment on local labor markets is straightforward. When more workers are willing to work at a given wage than there are jobs, workers will compete and drive

¹ Because the data in the WDI on child employment come from household surveys and such surveys with child employment information are not available every year, the data come from different years of data. The most recent year of data available for each country is selected and matched to GDP per capita in that year. Not every country has child time allocation data available, and tabulations regarding child time allocation from the WDI should not be considered representative. That said, it is the best data available to provide a global picture.

² Using the data from figure 1, a regression of child employment on GDP per capita has an R^2 of 0.41.

down wages. Hence, the more child workers in the economy, the lower the wages of jobs that children engage in (unskilled work). This creates a cycle of poverty: child labor leads to low wages, which leads to the need for more income in poor households, which leads to the need for child labor. Low unskilled wages also have long-term consequences for economic growth, as an abundance of inexpensive, unskilled labor discourages the adoption of skill intensive technologies. Countries adopt the technology that is complimentary to factors they are abundant in. Hence, the more child labor, the more unskilled labor, and the less likely countries are to adopt technologies that take advantage of skilled labor. The resulting lack of skilled labor market opportunities further discourages the accumulation of human capital, leaving countries worse off over the long term.

Child labor impacts growth, but it is also an artifact of a lack of growth, especially among the very poor. Most working children are involved in agriculture, usually on their own family's farm. However, the fact that children are mostly involved in family-based agriculture does not imply that family-based agriculture causes them to work. These agricultural, unspecialized households are poorer, and there is little to suggest a relationship between industrial composition and child labor beyond the correlation between industrial composition and poverty. While the introduction of new productive assets into very poor families can lead to more child employment, child employment appears to decline rapidly as family incomes increase.

Economic growth reduces child employment through several channels. Children are an important part of how poor households triage economic shocks. With growth, shocks become less meaningful in the lives of the global poor and the poor develop more capacity to cope with shocks without expansion of child labor. Children are important workers in household-based production. With growth, households specialize, moving production away from the home, and children are less apt to work outside of the home. Of course, families also care about their children, and growth may overcome constraints that limit a family's ability to facilitate play, healthy development, and education. Families may also simply desire to have more of these luxuries that are alternatives to child labor when they grow richer. Some popular writings express concern that economic growth will lead to more child labor through new employment opportunities for children, and in the short run, there is some evidence that children may work more to take advantage of transitory employment opportunities. However, there does not seem to be any representative evidence to suggest any merit to these concerns over the long run. Thus, development appears to reduce the level of child labor in the lives of the poor through a variety of mechanisms.

Policy also plays a role in the relationship between child labor and economic growth. While the literature suggests that labor regulation is ineffective at reducing child labor, positive alternatives to child labor tend to expand with economic growth, and the country's capacity to encourage these positive alternatives expands as well. Similarly, as countries become richer, social safety nets expand, credit markets develop, and insurance improves, all mitigating many of the causes of child labor. Policy may evolve endogenously with development to discourage child labor, or policy may explicitly hasten the decline in child labor. Either way, there is ample reason to view child labor as an important issue in the broader discussion of sustainable development.

1. The Impact of Child Labor on Economic Growth

The UN Sustainable Development Goals list the elimination of child labor as a practical and measurable target for sustainable development under Goal 8: "Promote inclusive and sustainable economic growth, employment, and decent work for all." Child labor has the potential to undermine economic growth through its impact on child development, wages, and technology adoption.

1.1 Impact on child development - Education

Each day has a fixed number of hours. As such, the time children spend working necessarily trades off with other uses of time: such as playing, studying, or schooling. Ensuring sufficient playtime for children was at the forefront of concerns about child labor in the early 20th century U.S. (Fuller 1922, Pangburn 1929), but education is more central in modern discussions of the cost of child employment. Guarcello et al. (2006) provide a nice discussion of the significance of child labor in the context of UNESCO's Education for All movement.

Employed children are less likely to attend school compared to children who are not economically active, but most working children also attend school. In fact, for some children, work allows them to afford school costs or helps their families pay for schooling (Manacorda 2006). While working to attend school can be relevant in some circumstances, Edmonds (2008) documents that working children are less likely to attend school in each of the 34 low-income economies examined. Some work is more difficult to combine with school than others. DeGraff et al. (2016) document that children in hazardous occupations in Brazil are especially unlikely to

combine work with schooling. This may owe to differences in hours worked, side effects of the work, or it may reflect selection in who participates in hazardous activities.

There is also a strong negative association between school test scores and child employment, even for the most common forms of work. Beyond its impact on attendance, work reduces the child's time available for study and the child's capacity to devote attention to school or homework. Some of the most compelling evidence on this comes from Brazil, where Emerson et al. (2017) follow the same children over time, observing each child's performance in school and labor status. Consider two children with equivalent educational backgrounds; both are in the same year and have identical performance measures. The child who starts working while still attending school does not test as well; the working child's lower test scores are equivalent to one quarter to three fifths of a year less knowledge accumulation than the child who did not start working.

Perhaps as a result of reduced test scores and disruptions to school attendance, working children tend to have substantially diminished school progression. Ray (2002) observes that an additional hour of wage work in Ghana is associated with more than a year's less completed educational attainment. Psacharaopoulos (1997) notes that children in wage work in Bolivia complete nearly a year less schooling than non-working children. He also discovers that working children in Venezuela have almost two years less attainment than their non-working counterparts.

Thus, the more prevalent child labor is in a country, the less educated its future workers.

1.2 Impact on child development - Health

The impact on individuals later in life from their work as a child appears to extend beyond the impact of work on educational attainment. In addition to the negative impact work has on schooling (discussed above), early work exposure has important consequences for physical and mental health outcomes later in life.

Engaging in work while young can impact health through numerous channels. Work induced illness and injury may directly worsen the health status of child laborers. Machinery designed for adult bodies and minds can be particularly dangerous for children. Working children typically face greater caloric demands than nonworking children. When these are not met with increased nutrient intake (either because of the circumstances of the child's work, the parent's lack of awareness about nutrition related concerns, or a lack of adequate and nutritious food), work may leave the child more vulnerable to illness, injury, and a lifetime of health issues. Working children

may also suffer health consequences by foregoing the health and nutritional knowledge usually acquired in school.

Of course, work does not necessarily reduce child health. Work may bring in additional resources that foster health. Work may induce increased health investments in the working child, such as improved nutrition or routine medical care.

Evidence that working children have worse health at the time of their work is generally absent from the literature. Owen O'Donnell and co-authors (2002) look at data from 18 developing countries and observe that across these countries, self-reported health status appears unrelated to whether the child is employed, in school, both, or neither. It is unclear whether the absence of evidence reflects a lack of relationship, measurement problems, or heterogeneity in the effect of working on health.

However, much more evidence links working while young to poor adult health. A child's labor status may influence adult health through two basic classes of mechanisms. First, physical injury at work may lead to health problems that survive into adulthood. The injuries may be immediately evident to the child (e.g. a broken foot) or may take years to become evident (e.g. exposure to toxins). Second, psychological stress or trauma at work in childhood may lead to health problems in adulthood. Speculation about this second mechanism owes to the psychology literature that shows a strong correlation between stress in childhood and the persistence of mental disorders—such as depression, anxiety, panic disorders, and schizophrenia— or even health problems such as diabetes, heart disease, and immune disorders (see Heim and Nemeroff 2001 for a review).

The most compelling evidence on the link between employment while young and long-term negative health consequences is from Brazil, where data on the age of first employment can be combined with adult outcomes (Emerson and Souza 2011). Kassouf et al. (2001) observe that individuals who start work earlier have worse self-reported health status as adults. Orazem and Lee (2010) show that some of the worst self-reported health status owes to a lack of education, but that working while young is associated with back problems, arthritis, and reduced strength and stamina in adulthood beyond work's impact on education.

Thus, child employment may have lingering effects throughout the working child's lifetime due to lasting physical and mental health challenges, as well as diminished education as outlined in the previous section. Not all work is harmful to child development, but the evidence of negative

effects of child labor is enough to cause concern in any discussion of sustainable growth and development.

1.3 Poverty persistence – Child labor breeds child labor

Child laborers are disadvantaged in their youth in ways that lead to reduced education and diminished physical and mental health. Hence, when they become adults, they will be poorer than their peers who did not work as children (Emerson and Souza 2011). In addition, evidence from high-income countries indicates that wages and job types are persistent over the life cycle (e.g. Oreopoulos et al. 2012). Because children are almost universally unskilled, they start in unskilled occupations with low wages. This poor start tends to lead to a lifetime in an unskilled occupation with low wages for that worker.

In fact, several studies document that child laborers are more likely to be parents of child laborers themselves. In Egypt, Wahba (2006) shows that the children of child laborers are 10 percent more likely to be child laborers themselves, holding everything else equal. In Brazil, Emerson and Souza (2003) show that the impact of having a parent who was a child laborer increases the probability that the child works. The magnitude of the increases in the probability the child works is large. Having a parent who was not a child laborer reduces the probability a child works by about the same amount as adding ten years to the parent's education. These studies tend to associate this perpetuation of child labor as being something about norms: "I worked as a child, so too should my child." Norms may matter, but as discussed below, child labor responds to small changes in living standards, suggesting that norms can change quickly with development. Moreover, Bharadwaj et al. (2020) document in India that having a working sibling reduces the chance other siblings work, an observation that is hard to explain if strong social norms drive the intergenerational transmission of child labor.

1.4 Poverty persistence – Child labor depresses unskilled wages

Children are generally employed in tasks that require little education or training. These low skilled jobs tend to have low wages. As long as unskilled labor is not infinitely elastic in a local labor market and labor demand is decreasing in wages, then the increased supply of unskilled labor from the presence of child labor will depress unskilled wages. The most relevant evidence illustrating that an increase in unskilled labor may lead to lower wages comes from the immigration literature

and uses exogenous changes in migrant availability to vary the prevalence of unskilled labor, all else equal (Friedberg and Hunt 1995). As we will discuss below, lower adult wages lead to more child labor. Hence, there is an unhappy circle: low wages lead to child labor, which depresses wages further, thus leading to more child labor.

1.5 Poverty persistence – Child labor discourages the adoption of skill intensive technologies

Through its impact on education and labor markets, child labor reduces incentives for the adoption of new, skill intensive technologies. Acemoglu (2002) argues that technology and human capital are relative complements. Hence, child labor deters technological investment if it reduces human capital levels through decreased education. Even without decreasing education directly, more abundant unskilled labor induces the adoption of production methods that are unfavorable to skill accumulation. Hornbeck and Naidu (2014) show that the prevalence of unskilled, low-wage black labor in the American South delayed the modernization of agriculture and hindered agricultural development. Similarly, Clemens et al. (2018) show that the termination of the Bracero program for temporary agricultural workers from Mexico reduced the availability of unskilled labor and led to the subsequent adoption of agricultural technology. Further, the technologies that are adopted when unskilled labor is abundant will be those complementary to unskilled labor. This trend has a dual effect: it further depresses average wages (Kiley 1999) and also reduces the efficiency of capital and skilled labor (Caselli and Coleman 2006). It is well documented in the literature that a shortage of skill-intensive technology adoption has deleterious consequence for economic growth (e.g. Galor and Weil 2000).

2. The Impact of Economic Growth on Child Labor

To understand how economic growth impacts child labor, it is useful to have a simple analytical framework in mind. Poor families balance the child's potential economic contribution in each possible activity against alternative uses of child time, such as schooling or leisure. Different activities vary in their potential economic contribution. Families also may have preferences about these activities beyond the economic contribution. Children work when their family's valuation of the child's economic contribution is at least as large as the family's valuation of other uses of child time.



Figure 2: Pay Status of Working Children

Source: Authors' Calculations from the World Development Indicators for children 7-14 using the most recent year's data available for each country in the WDI. July 2020 download.

What is the child's potential economic contribution? Figure 2 is a tabulation of the pay status of working children based on the WDI data. Among the countries with information available, 74 percent of employed children are in unpaid economic activities. The working child's primary economic contribution comes through the help the child offers her family. Most often, this help is in agriculture or in providing domestic services that free up the adult for income-generating pursuits. When a family business or farm is present, the children often help. Working in the family business or farm is the most prevalent economic activity of children.

It should be obvious that the child's potential economic contribution, whether it is a wage or a contribution to household production, depends on the child's local economic environment. In this section, we review how the changes in the child's economic environment influence child employment. Overwhelmingly, the empirical literature emphasizes that family living standards appear to be the primary factor influencing how children spend their time.

2.1 Industrial Composition of Employment, Technological Change, and Child Labor

Economic growth is associated with changes in the industrial composition of employment. Baldwin et al. (2001) emphasize the importance of industrialization in fostering growth, and Johnston and Mellor (1961) highlight that the process of economic growth tends to be associated with a decline in the agricultural labor force and the share of national income in agriculture.

Changes in the industry mix impact growth, and growth impacts the industrial composition of employment.

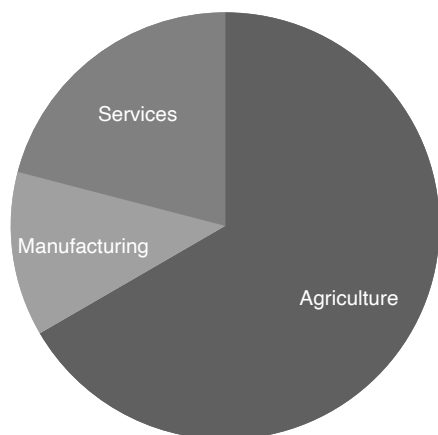


Figure 3: Distribution of Working Children by Sector

Source: Authors' Calculations from the World Development Indicators for children 7-14 using the most recent year's data available for each country in the WDI. July 2020 download.

Children are not uniformly distributed across industrial sectors. Figure 3 plots the distribution of working children across sectors for the data available across countries in the WDI data. 65 percent of working children are in agriculture, 13 percent in manufacturing, and 19 percent in services.

The salient question here is whether changes in the industrial composition impact child labor directly. It is plausible. Children are better at some tasks than others. Skill intensive work excludes children who have not been able to accumulate the necessary skills. Similarly, activities that require strength and physical development tend to be relatively difficult for young children. In fact, it is widely believed that child labor is an artifact of industrialization. In chapter 15 of *Kapital*, Karl Marx writes: “In so far as machinery dispenses with muscular power, it becomes a means of employing laborers of slight muscular strength, and those whose bodily development is incomplete, but whose limbs are all the more supple. The labor of women and children was, therefore, the first thing sought for by capitalists who used machinery.”

Yet there seems to be a discrepancy between what Marx and others have suggested and what the evidence indicates. Industrialization, the adoption of machine power, and the advancement of new technologies all go hand in hand with economic development, and we know that child labor is much lower in more developed economies. Of course, it could be the case that

industrialization and technological change puts upward pressure on child labor, but that pressure is masked by the strong relationship between child labor and income. So, it seems reasonable to ask: is there evidence of a link between industrialization and child labor in the data?

If anything, child labor is lower when manufacturing is more prominent. Figure 4 contains a plot of the economic activity rates of children against the importance of manufacturing to each country's economy (measured as the share of GDP that owes to value added in manufacturing). Overwhelmingly, countries with greater reliance on manufacturing have fewer working children. Of course, nations with relatively larger manufacturing sectors are also wealthier, and in fact the correlation between child employment and the importance of manufacturing is much weaker after one controls for the relationship between GDP per capita and child employment. After controlling for income, manufacturing value added can account for 4 percent of the remaining cross-country variation in child employment. While the explanatory power is minimal, the conditional correlation is negative, meaning that child employment is lower when manufacturing accounts for a larger share of GDP.

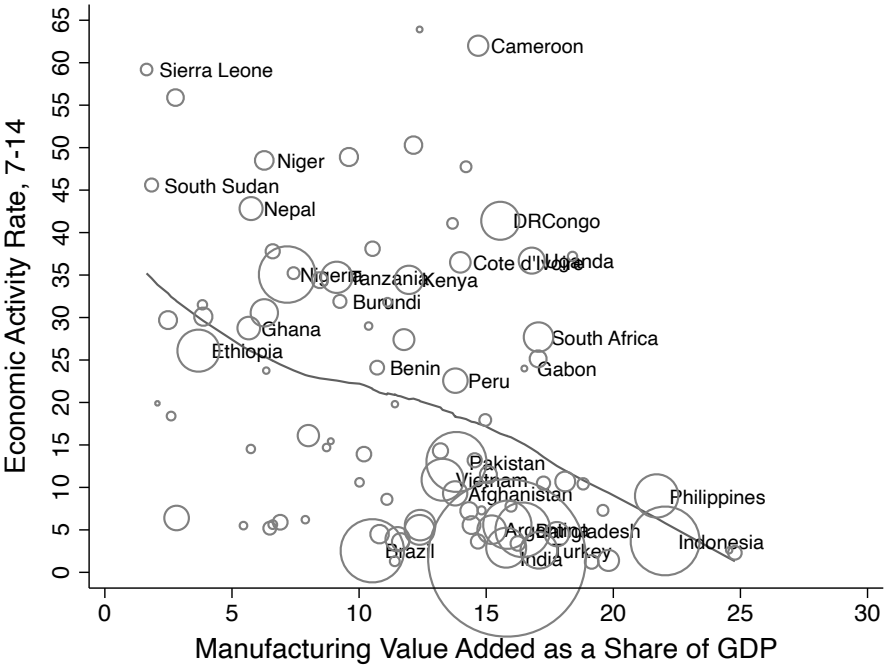


Figure 4: The Economic Activity of Children and Value Added in Manufacturing

Notes: Figure plots the fraction of children who are economically active between the ages of 7 and 14 (inclusive) against share of GDP that owes to manufacturing value added. The size of each circle reflects the population of children under 15 in the country (larger circle = more children). The curve is a local kernel smoother. Source: World Development Indicators for most recent year with economic activity information available in each country. Swaziland and Thailand excluded as outliers in manufacturing value added.

Technological advancement with growth does not need to be limited to changes in the industrial composition of employment. Changes in the technology of production can affect child labor even without changes in the industrial composition of employment. For example, Brown et al. (1992) document technological changes in the U.S. Fruit and Vegetable canning industry that led to adult workers replacing child workers in the industry. Levy (1985) shows a relationship between the mechanization of Egyptian agriculture and the decline of child labor in cotton. Two important technologies he emphasizes are the spread of tractors and irrigation pumps. While Marx might have been right to emphasize that industrialization diminished the return to stature, technological advancement creates technologies that require skills to manipulate productively. Children are often not capable of providing these skills.

While the body of evidence on child labor and technology describes examples where technology eliminates child labor, technological change may not always discourage child labor. This depends largely on the type of technology that is adopted, and this choice will be influenced by which factors of production are relatively more abundant in supply. Acemoglu (2007) shows that economies will develop or adopt technologies that take advantage of a factor that is relatively prevalent. Hence, more unskilled labor leads to the adoption of unskilled labor-intensive technologies, weakly increasing demand for that factor. This may lead to increased demand for child labor. Acemoglu (2002) emphasizes the “poverty trap” nature of this dynamic: low skill-intensive technologies then induce the accumulation of unskilled labor by slowing demand for skilled labor. Thus, while technological advancement may proceed with growth, it is not inevitable that this will result in a decline in child labor.

While technology adoption may influence labor demand as described above, the literature examining the impact of labor demand on child labor is limited. The one exception appears to be how child employment responds to labor demand shocks caused by transitory output price changes. A temporary increase in output prices leads to higher child wages during the episode of high prices. Child employment seems to increase when there is a temporary growth in child wages. In her study of Brazil, Kruger (2007) finds that short term increases in coffee prices led to more children working while prices were high. In this case, children did not appear to be picking beans. Instead, they were helping fill in for their parents in other activities given that parents temporarily increased their work to take advantage of higher coffee prices. This phenomenon of children

working to take advantage of increased transitory earning opportunities is also apparent in Shah and Steinberg's (2013) study of how children respond to transitory rainfall shocks in India.

While child employment may be elastic to transitory earnings variation, when the changes are longer-term, child employment is more responsive to living standards and adult wages than to child wages. Some of the most interesting evidence on this trend comes from studies that explore the link between international trade and child labor. A study from Vietnam by Edmonds and Pavcnik (2005) examines how households are impacted by the liberalization of rice trade in the 1990s. One in five Vietnamese children were involved in rice production before liberalization. Real rice prices rose dramatically during liberalization, and child labor was expected to increase to take advantage of potentially higher wages in the rice sector. Instead, it appears that roughly 1 million fewer children worked as a result of rising rice prices in Vietnam, despite possibly more lucrative employment opportunities. The difference between this evidence from Vietnam and Kruger's evidence from Brazil may owe to the permanent nature of the rice price changes in Vietnam. The government of Vietnam was actively suppressing the price of rice, and liberalization led to a permanent increase in rice prices and the income of rice farming families.

This example in Vietnam is not unique. Cogneau and Jedwab (2012) report very similar findings from Cote d'Ivoire, where child labor is pervasive in the cocoa industry. A permanent reduction in cocoa prices should have reduced child labor by reducing the value of a child's time spent in cocoa production. Instead, they document an increase in child labor and a decline in schooling because of the decline in family income.

In addition to changes in prices, child labor responds to the composition of employment opportunities. In a study the impact of India's trade liberalization in the 1990s, Edmonds et al. (2010) find that there are substantive changes in the industrial mix of employment. These changes in the industry mix should have changed the employment opportunities open to children, but again, similar to the price literature, the only detectable impacts on child employment come through changes in living standards. These findings from India are mirrored in Kis-Katos and Sparrow's (2011) study of child labor during Indonesia's trade liberalization. In Peru, Dammert (2008) documents changes in employment opportunities due to anti-coca policy, which substantially reduced coca production. She finds that children work more in response to this decline in coca production. Like Kruger's work in Brazil, children appear to fill in for parents in domestic work rather than entering wage work. In general, the literature seems to concur that employment

opportunities change, but rising family incomes are the driving force behind changes in child employment.

While the main effect of changes in employment opportunities on child labor may be driven by the impact of those employment opportunities on household incomes, within this dominant channel, there is heterogeneity in the experience of children that can be incredibly important. For example, while Dammert shows that children work more when coca production collapses in Peru, Sviatschi (2020) finds that growth in coca brings more children into illegal drug work. While this is just one example, it illustrates an important point. Findings that hold at the mean need not hold for everyone. Hence, on average, child labor is more responsive to living standards than child wages, but higher child wages will draw some children into work who otherwise would not and some of that work might be especially undesirable for children. Unfortunately, little progress has been made in understanding the underlying heterogeneity in child work environments and in how some of those worst work environments change with development.

2.2 Living Standards and Child Labor

Economic growth is generally defined as improvements in average per capita income. Child labor is overwhelmingly concentrated in the poorest of households. Hence, growth can impact child labor through changes in living standards when growth benefits the poor. While there is considerable nuance in the literature, it seems reasonable to assume that growth in average per capita income will typically raise the living standards of the poor (Dollar and Kraay 2002). This section argues that improvements in the standard of living of the poor influence child labor by changing how households cope with economic shocks, how households organize their production and consumption, and how households make decisions regarding child time allocation.

2.2.1 Growth, Shocks, and Child Labor

There is more volatility in the lives of the world's poor. They face more frequent economic shocks, and the welfare consequences of these shocks are greater because of the diminishing marginal utility of wealth. While the world's poor use many mechanisms to buffer income shocks, they do not perfectly insure consumption against income risk (Dercon 2002), especially for the poorest of the poor (Jalan and Ravallion 1999). Economic risk is not the only source of risk in the lives of the world's poor. Health shocks can have enormous consequences, and Miguel et al. (2004) add that

civil conflict is negatively correlated with economic growth as well. Thus, growth should reduce the extent and frequency of shocks in the lives of the world's poor.

This reality is important for child employment because child employment is a meaningful component of how households manage negative economic shocks. In studying how Indian families deal with unanticipated rainfall shortfalls, Jacoby and Skoufias (1997) find that families self-insure by varying child employment and school attendance. Specifically, they observe declines in schooling and increases in child employment in households that experience both household-level and aggregate shocks. Moreover, they decompose variation by separating predictable seasonal variation in income from unpredictable variation in income. They find that small farm households adjust schooling and work in response to both predictable and unpredictable variation in income. Hence, they argue that small farms are not well-insured *ex-ante*, and they do not have access to seasonal borrowing and lending. A similar study in Tanzania was conducted by Beegle et al. (2006). They correlate self-reported crop shocks with changes in child employment. They observe a significant increase in child employment in households that report experiencing a crop shock, and that this shock is larger among households with fewer assets.

Insurance failures and child labor are not just interconnected in rural agrarian societies. Using data from urban Brazil, Duryea et al. (2007) compare households in which the male head becomes unemployed to households in which the head male is continuously employed. They find that an unemployment shock significantly increases the probability that a child enters the labor force (by as much as 60 percent) and decreases the probability that a child attends school. They do not observe changes in labor supply in anticipation of shocks. Hence, they conclude that the child's labor supply in part compensates for the lack of unemployment insurance. Moreover, Duryea et al. observe a strong negative correlation between schooling completion and unemployment of adults in the household. For girls in particular, it seems that the loss of employment for the male household head often triggers a complete and permanent withdrawal from school.

The idea that child labor is part of the household's self-insurance strategy seems broadly supported in the literature. Yang's (2008) study of how Philippine households with overseas migrants were affected by the 1997 Asian financial crisis is especially useful for understanding the insurance component of child labor supply. Migrants from the Philippines work in dozens of countries. Thus, the financial crisis was broadly felt in the Philippines, but there was a great deal of heterogeneity in how families were impacted by the crisis depending on in which country their

migrant members lived. Yang observes that a 10 percent appreciation in the Philippine / foreign exchange rate is associated with a 6 percent increase in remittance flows. Schooling increases, schooling expenditures increase, and work declines in households that benefited from the appreciation. Schooling is an investment, and families seem to be “saving” transitory income through increased schooling and less work. Similarly, Theoharides (2020) finds that when barriers to migration eliminate lucrative migration channels for Filipinos working in Japan, child employment increases in response. In El Salvador, Duryea and Morales (2011) study the child labor response to the global financial crisis and find that school attendance decreased for both girls and boys, while child employment increased for boys ages 10 to 16.

When families experience an economic crisis and do not have opportunities for their children at home, they sometimes send their children away for work. Without a parent, this can place children in particularly vulnerable situations (Edmonds and Shrestha 2013). Akresh (2009) examines child fostering decisions in Burkina Faso and finds that the family may benefit from this sort of arrangement due to reduced food demand from the child. For adolescents migrating from Bolivia to Argentina for employment, these migratory experiences provide wage support for their families in Bolivia (Punch 2007).

Aside from economic shocks, health shocks can have important consequences for child labor. Extreme health events like parental disability seem to be strong predictors of vulnerable children transitioning into worst forms of child labor (Edmonds 2010). Similarly, when household members become sick or die, it is common for children to take over their roles. Nepal and Nepal (2012) document this phenomenon in Nepal, while Dillon (2013) similarly shows that children fill in for the mother in terms of household work when the household faces illness. This may be because the work of mothers and children are often intertwined (Francavilla and Giannelli 2010). Conversely in Tanzania, Alam (2015) finds that parental illness affects education, but not through increased child labor. Monitoring children also appears to matter for engagement in schooling, and Bratti and Mendola (2014) show that when mothers are ill and cannot monitor their children, schooling falls and there is some evidence that children increase work. Health shocks can also lead to engagement in the worst forms of child labor. Kamei (2018) finds that paternal mortality is correlated with hazardous child labor in Nepal.

Overall, children appear to increase work in response to both economic shocks and health shocks. This observation that children tend to work more during economic downturns, when the

economic contribution of children is lower, may seem surprising. Even when the net economic contribution of the working child is small, it may be important to the welfare of a poor family and may help the household cope with these shocks. We have previously mentioned that children also seem to work more during transitory positive shocks to their earnings potential. Thus, child employment can be an important component of how families respond to transitory changes in their environment, whether the shock is positive or negative.

2.2.2 Growth, Household Production, and Child Labor

Most working children do so within the home. Hence, the economic organization of the home is tremendously important for how children spend their time. In this section, we argue that growth discourages child employment if production shifts out of the household but has the opposite effect if it brings productive assets inside households that previously lacked such assets. As such, children in extremely poor households may become more likely to work when incomes rise, but child employment appears to fall as subsistence concerns abate.

Economic growth expands the extent of the market, creating opportunities for household specialization and demand for higher quality products than could be self-produced at home (Locay 1990; Goodfriend and McDermott 1995; Kelly 1997). Research on household specialization and child labor has largely focused on urbanization or trade. Fafchamps and Shilpi (2005) observe that in Nepali data, there appears to be greater household specialization as proximity to urban areas increases. Fafchamps and Wahba (2006) argue that children are more likely to attend school and not work as specialization increases with urban proximity. Interestingly, Fafchamps and Wahba note that while work in the household is reduced with urban proximity, child labor rises outside of the household. That is, the nature of child employment changes. Fafchamps and Wahba observe that this increase in hours worked outside the household is not enough to offset the total decline in hours worked.

In the study of rice trade liberalization mentioned above, Edmonds and Pavcnik (2005) document that growth in the rice trade in Vietnam led to increasing incomes and a resulting decline in child labor. In a companion paper, Edmonds and Pavcnik 2006 argue that a rise in household specialization underlies much of this decline. Rising income leads to demand for better quality goods than can be produced within the household. The shift in demand for goods produced outside the household reduces the employment opportunities within the home.

While household specialization discourages child employment within the home, economic growth may also bring productive assets into the home. The availability of land, livestock, and other productive assets within the household can be an important influence on the child's potential net economic contribution. Children can only work in family businesses when there is one. Given that wage child labor is rare in most countries, studies frequently find that children are more likely to work if their household owns a business (e.g. Edmonds and Turk 2002). Hence, growth could increase child employment if it brings more productive assets into the household.

Many poor households also lack available labor other than children. When the household needs additional labor in order to work new productive assets, the household turns to children. Edmonds and Theoharides (2020) examine a productive asset transfer in the Philippines for families of child laborers. Productive asset transfers are a common tool used by policy makers to try to reduce child labor by improving the household's earning potential. While households experience improved food security and adolescents report increased life satisfaction in response to the productive asset transfer, children not engaged in child labor at baseline are more likely to be in child labor, including hazardous child labor. de Hoop et al. (2020) find a similar increase in child labor when production grows inside the home in Malawi and Zambia in response to an unconditional cash transfer. In Bangladesh, children spend more time working after asset distribution from an Ultrapoor Graduation Program (Sulaiman 2015, Hossain et al. 2017), including four years later in self-employment (Bandiera et al. 2017). The evidence is not uniform, however, and Emran et al. (2014) do not find an increase in child labor in response to Ultrapoor Graduation Program asset distribution in Bangladesh.

Some types of businesses and productive household assets are more conducive to child involvement than others. Cockburn and Dostie (2007) observe that children in Ethiopian families are more likely to work on the farm when there is small livestock present than large livestock. Of course, families that own productive assets are often wealthier than families without productive assets. A recent study from North India by Basu et al. (2010) documents that the relationship between family landholdings and child labor follows an inverted U-shape. Poor children work more as their family adds productive assets, but at some point, child labor declines with the addition of productive assets as the family becomes sufficiently wealthy to avoid child labor.

In fact, this story from Basu et al. is probably the most useful for understanding the complex interactions between growth, the economic organization of the household, and child employment.

At very low living standards, growth can bring in productive assets and employment opportunities for children that would not otherwise have been available. However, as living standards improve, the technology of production may shift away from children. Household's demand for home produced goods declines in favor of higher quality goods available in the market. Combined with the family's general desire to keep their children out of labor, discussed in the next section, child employment declines with increases in living standards.

2.2.3 Growth, the Demand for Education and Leisure, and Child Labor

The canonical child labor model is Basu and Van's (1998) "Economics of Child Labor." In that model, they build from the assumption that the absence of child labor in a family is a luxury good for parents. In particular, they postulate that child labor occurs if and only if parents cannot provide the family with an above subsistence living standard absent child labor. This theory is called the "luxury axiom." This view of preferences about child labor is extreme, but it appears consistent with the findings of several recent papers.

In studying changes in child labor in Vietnam during its rapid growth of the 1990s, Edmonds (2005) uses data from the early 1990s to understand what families perceive as subsistence. He compares the changes in living standards observed in the 1990s to these subsistence perceptions. Child labor levels were cut in half in Vietnam during this time, and Edmonds finds that the progression of living standards from below to above subsistence levels in Vietnam can account for 80 percent of the decline in child labor.

In a study in Ecuador, Edmonds and Schady (2012) examine the impact of a randomized unconditional cash transfer provided to families in the poorest 40 percent of the population. The lottery led to a transfer that was equivalent to 7 percent of monthly expenditures, and it was associated with a 78 percent reduction in paid employment of children. The transfer is less than foregone earnings from child labor. Because families use the cash transfer to keep children in school and out of the labor market, the cash transfer leads to a reduction in household income. This is consistent with the luxury axiom. The transfer is enough that, between the transfer and adult income, families can meet their subsistence needs without child labor. Hence, families forego child labor even though that leads to a reduction in total household income.

Additional income might also solve other household problems, like an inability to transfer resources over time, that contribute to child labor. In a paper in South Africa, Edmonds (2006)

documents that illiquidity has an important influence on child labor decisions. This is consistent with the observation that income growth reduces child labor, as households are better able to afford things like school fees where liquidity is important. Along with Pavcnik and Topalova (2010), Edmonds argues that both illiquidity and school fees cause poor families to experience a relative increase in child labor and decline in schooling when family incomes fall. Illiquidity can also explain why child labor rises in temporary economic downturns as discussed above. Families resort to child labor to cope with transitory events, if they cannot easily borrow against future earnings.

Of course, the decision to work does not depend on the potential economic contribution of the child alone. It also depends on the perceived returns to other available activities. Schooling is important, and economic growth may change the returns to schooling (either in the future or through improving current school quality). It may also change how the family values schooling. Schooling is not the only alternative use of a child's time outside of work. Leisure and play are important components of how children spend their time and may be critically important for child development. The family's value of play and leisure may also change with growth. Hence, many forces may be working against child employment in the course of economic development.

3. The Role of Governments

A review of how governments can foster growth- or how growth impacts the functioning and activities of governments- is beyond the scope of this essay. This section presents a brief overview of the types of actions that governments take in the process of economic development that will directly impact child labor. Specifically, how does child labor related policy change with growth? Each topic could be worthy of its own separate review, and this is not intended to be a complete review of policy responses to child labor.

3.1 Regulation

Encouraging the adoption of anti-child labor regulations and minimum age of employment laws was the center of 1990s global child labor policy. As such, now nearly every country in the world has a minimum age law. This process of regulation differs from the historical process of the regulation of child employment that took place in many of today's high-income countries where regulation followed large societal declines in child employment (Moehling 1999).

Edmonds (2014) has argued that contemporary minimum age of employment laws in low and middle income countries appear to largely be unenforced. Doepke and Zilibotti (2009) argue that unenforced laws run the risk of undermining demand for real, meaningful regulation. Partially enforced laws may even have negative effects. Manacorda (2006) documents that enforced child labor laws in the US in 1920 may have decreased schooling of the siblings of child laborers. Bharadwaj et al. (2020) document that the data are consistent with declines in child wages after India banned child labor. They argue that imperfectly enforced laws decrease child wages because of the risk of a fine and that lower wages for children lead to more child labor.

There are no encouraging signs in the literature that economic growth will lead to either improvements in this current regulatory environment or in the enforcement of regulation and thereby a reduction in child labor. Further, the focus of regulation is typically based on a child rights framework rather than an economic framework. As such, the focus of regulation is usually too limited to prevent the negative consequence child employment has on economic development. For example, the United Nations Convention on the Rights of the Child (UN-CRC) emphasizes the importance of protecting children from "work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development" (1989, Article 32). The public's general understanding of the concept of child labor applies to activities that violate this standard, and this general idea of child labor as work that is undesirable for the child is also in ILO Convention 182 on the Worst Forms of Child Labor (C182) that followed the CRC. Child labor regulations attempt to reflect CRC and C182. The most common forms of work that interfere with economic development may not fall within this limited definition of harmful work.

Moreover, this rights-based definition of child labor is built on a lot of ambiguity. Whether work is hazardous depends on the tasks performed in the work and working conditions, and one can debate what hazardous means. When does work interfere with education? When is it harmful to the child? The ambiguity inherent in this approach to regulation may in part contribute to its lack of enforcement.

The economics literature, the focus of this study, uses a broader definition of child labor. Economics is the study of decision-making under constraints, and the definition of child labor in the academic literature takes into account that there is a constraint on child time. Hence, child participation in any activity has a cost to the child in terms of foregone opportunities. In the same

way, child participation in any activity also has a return or benefit to the child. Researchers cannot distinguish between child employment and child employment that is net harmful (which would seem more consistent with the rights definition of child labor). As a result, the economics literature often uses child employment and child labor interchangeably much as adult employment and adult labor are used.

The implications of this for child labor policy are important. If labor regulation is focused on a child rights definition of child labor, even effective labor regulation will ignore the types of child employment that may be most important for the impact on child development discussed in section 1. The idea of promoting positive child activities discussed in the next section then seems like a more practical approach for avoiding the negative effects of child labor on growth.

3.2 Promoting Positives

As countries develop, they develop social assistance infrastructures, and many countries have begun doing so with conditional transfers that incentivize families to invest in human capital. Some of the strongest evidence of an impact of policy on child time allocation comes through studies of conditional transfers. Given the close connection of poverty and child employment, taking punitive action against those engaged in child employment runs the risk of punishing the poor for being poor. This, coupled with the fact that political will for the regulation of child employment appears directed against a subset of activities, suggests that anti-child labor efforts stand the best chance of improving welfare if they focus on encouraging positive actions by parents and children rather than discouraging negative.

What types of policies, programs, and projects raise the value of child time outside of child labor? The options are vast. Conditional transfer programs give poor families additional resources for sending their children to school. Programs like Mexico's Progresa, which provides cash transfers, have been shown to substantively alter child time allocation, increasing schooling and sometimes decreasing child labor at the same time. Fiszbein et al. (2009) have assembled an exceptional review of conditional cash transfer programs and their effect on the welfare of the world's poor. de Hoop and Rosati (2014) review this literature as it relates directly to child labor. By increasing returns to education and reducing poverty, conditional cash transfers appear to both reduce the net economic gain from having the child work and diminish the family's need for that economic contribution.

Children in hazardous forms of child labor are often both negatively selected in that they come from the most disadvantaged families (Edmonds 2010; DeGraff et al. 2016) and tend to receive greater compensation for their work, perhaps as a compensating differential for the hazards of the work. Hence, it is reasonable to be skeptical about the scope for conditional transfers to be effective against hazardous forms of child labor. The evidence seems to suggest otherwise. Discouraging child labor does not require full earnings replacement with the transfer (de Hoop and Rosati 2014). In Nepal, Edmonds and Shrestha (2014) evaluated a conditional transfer to children associated with carpet factories in Kathmandu. The value of the transfer was 20 percent of the income children could earn as weavers, and they found that it nearly eliminated child participation in weaving during the period of the incentive.

Conditional transfers are expensive and may not be affordable in low-income economies. Short-term projects providing conditional transfers may not provide lasting impacts. In Edmonds and Shrestha's Kathmandu study, for example, they revisited subjects after a year and a half and found no lasting evidence of an impact of the program on schooling or child labor. Thus, using conditional transfers may require enduring support that is unaffordable in many settings.

Smaller scale versions of the same idea (raise the net return to alternatives to child labor) may be more sustainable and still impactful. This might include the reduction in school fees, investments in school quality, or improvements in school access (Guarcello et al. 2006). All three of these seem to generally accompany the process of economic development, so there is scope for them to directly influence child employment and child labor beyond the general changes we expect to see as a result of rising living standards. That said, Jafarey and Lahir (2005) point out that when households face liquidity constraints, resource transfers to the household might reduce child labor more than equivalent resources transferred to the schools for quality improvement.

The direct promotion of vocational skills and job training is another avenue through which positive alternatives to child labor could decrease the prevalence of child employment. It seems that historically, economic development is associated with a rise in availability and interest in vocational education (which may then fall as development continues, Benavot 1983). There seems to be a lot of optimism about this in the child labor policy world at the moment, and Attanasio et al. (2017) find long-term benefits to vocational education, at least in Colombia, while other studies find little to no benefit from these programs (McKenzie 2017). Direct

evidence of an impact of vocational skills or job training on child labor is not available at the time of writing.

3.3 Social Safety Nets, Credit and Insurance

As countries grow wealthier, it is not unusual to see the emergence of social safety nets beyond just conditional transfers, and these safety nets protect the most vulnerable from the circumstances that lead to child labor. To the extent that child labor is motivated by subsistence concerns as in the canonical model of child labor, social safety nets that ameliorate poverty can eliminate motives for child labor.

Some social safety nets include conditional cash transfers as discussed in the previous subsection. The impact of positive incentives such as conditional cash transfers alone might not be enough to protect children from working when the family faces an economic crisis. de Janvry et al. (2006) study the impact of the conditional cash transfer in Mexico on child employment when families face idiosyncratic shocks. They find that, while families protect child school attendance during a crisis (the transfer is conditioned on schooling), they also turn to the children for assistance through child labor. Interestingly, Fitzsimons and Mesnard (2014) study the impact of a father's permanent departure in Colombia. There, they find that conditional transfers can compensate for the loss of the father, without causing the family to turn to child labor. The contrast between their study in Colombia and the Mexico study highlights that the extent to which social assistance can mediate an event may depend on how permanent the shock is and the context for the transfer.

Many social safety nets rely on unconditional cash transfers (UCT) rather than conditional transfers. When the policy goal is protecting household well-being, the flexibility of the unconditional cash transfer allows households to select what is best for them. As discussed above, at very low levels of development, households may invest in bringing in productive assets as in the evaluation of UCTs in Zambia and Malawi (de Hoop et al. 2020), resulting in a growth in child labor. A very different result is in Edmonds and Schady's (2012) study from Ecuador where households seem to spend the entire UCT to keep children in school, effectively eliminating children from entering paid employment at the end of primary school. Social assistance programs are more than CCTs and UCTs. De Silva and Sumarto (2015) review the wide range of social

assistance programs in place in Indonesia and argue that these programs play an important role in discouraging child involvement in paid work.

Of course, with development comes improvements in credit markets that may help families transfer resources across time without relying on child labor. Both Baland and Robinson (2000) and Ranjan (2001) present theoretical models showing that market imperfections can lead to child labor. In the study in South Africa discussed above, Edmonds (2006) finds that families are unable to smooth consumption against anticipated changes in income and that this leads to more child employment. Hence, functioning credit markets can prevent some instances of child labor. Bandara et al. (2015) document that families with bank accounts in Tanzania seem to be able to avoid relying on child labor when farming families face a negative crop shock. In Guatemala, Guarcello et al. (2009) find that exposure to negative shocks induces children to start working, but when coping mechanisms like insurance are available, child labor is reduced and education increases. Alvi and Dendir (1998) document a similar phenomenon in Bangladesh, where child labor only increased after the 1998 floods if households did not receive credit. Across countries it appears to be the case that those with more developed credit markets experience less child labor (Dehejia and Gatti 2005).

This positive link between credit and the absence of child labor does not imply that microfinance projects can be presumed to decrease child labor. If successful, they change the economic structure of the household. Depending on the impact of microfinance on the availability of employment opportunities, the location of employment opportunities, the types of work available, and the living standard of the household, microfinance projects can increase or decrease child employment and child labor. This is particularly true when labor markets are not functioning efficiently (Dumas 2013), and it is thus difficult to hire labor from outside the household. Islam and Choe (2013) document decreases in schooling and increased child labor in Bangladeshi households involved in a microcredit program. Wyndick (1999) points out that in the Guatemalan context, the response to microcredit depends on the substitutability of hired labor and child labor. When hired labor is not easily substitutable, child labor rises in response to microcredit. In Bosnia and Herzegovina, access to microcredit increases the labor supply of adolescents (16-19 year olds) in the household's business (Augsburg et al. 2015). The earlier discussion about the mixed relationship between the technology of production and child employment is relevant here as well, and just as ambiguous, in the context of microfinance.

Much like credit, formal insurance contracts tend to emerge with development (perhaps as an artifact of the ability to enforce contracts that evolves with development). As discussed above, there is a bounty of evidence that both economic and health shocks lead children to work. Recent causal evidence from Landmann and Frolich (2015) shows the provision of health and accident insurance to participants in a microfinance project in Pakistan helped reduce child labor and participation in hazardous activities.

Interestingly from this Pakistani example, the impact of health and accident insurance on child labor occurred in both households experiencing a health shock as well as those that did not during the study period. One likely explanation for this is that when households know that future shocks are likely and will induce child labor, they may choose to have children work in the present. That seems especially relevant in the realm of health where some sort of negative health shock is inevitable in life.

Summary

Child labor is a human rights issue. This essay is motivated by the question of whether child labor is also a sustainable development issue. This review of the literature, suggests it is.

The world's 218 million working children depress economic growth in the short run by depressing the wages of unskilled labor, worsening poverty, and discouraging the adoption of skill intensive technologies. In the long run, work today depresses child development and leaves a country with a substantive share of the future adult labor force poorly positioned to take advantage of new opportunities for growth. Of course, not all child employment is on balance bad for the country, but the developmental impact of both common forms of work and hazardous forms of child labor merits attention in the process of sustainable development.

Because of this impact of child labor on economic growth, there is a strong case that child labor policy should be part of policy efforts to promote sustainable development, without appealing to human rights issues, even though those issues can be important. This essay has reviewed child labor policy that is likely to evolve with economic growth. It is not a thorough review of policy tools available to combat child labor. Nonetheless, the main lesson from the policy discussion herein seems broadly relevant: promote positives and social safety nets. Promoting alternatives to child labor leads families to choose those alternatives, and social safety nets can eliminate motives for child labor. An important lesson from all the literature reviewed herein is

that child labor can change dramatically and quickly in countries as a result of changes in the economic and policy environment.

While sustainable development projects and programs can focus on child labor and child labor policy may hasten its decline, this study has also documented how central poverty appears to be in explaining the existence of child labor. Thus, a lack of attention to child labor may understate the benefits of projects that promote sustainable economic growth and development. Evidence suggests that in the short run sustainable development projects could increase child employment as households first acquire productive assets or transitory opportunities that induce families to engage their children to take advantage of a short-term opportunity. However, long-run growth and development should eventually lead to declines in child labor as motives for child labor become less salient with improved living standards.

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