CHILDREN'S OWN TIME USE AND ITS EFFECT ON SKILL FORMATION

Liyousew Gebremedhin Borga

CERGE

EI

Charles University
Center for Economic Research and Graduate Education
Academy of Sciences of the Czech Republic
Economics Institute

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Liyousew Gebremedhin Borga

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Liyousew Gebremedhin Borga†

CERGE-EI‡

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Abstract

Using time-use data from a longitudinal survey (covering Ethiopia, India and Vietnam), the present study examines how the amount of time children spend on different activities impacts their acquisition of cognitive and non-cognitive skills. Modeling the skill formation production function of children and extending the set of inputs to include the child's own time inputs, the study finds that child involvement in work activities such as domestic chores and paid activities are associated with a reduction in both cognitive and non-cognitive achievements. The results imply that there is an indirect adverse effect of child work on skill development through the reduction of hours of study. The results are consistent across all the study countries and for both young children and adolescents. These results are also robust to a variety of specification checks.

Keywords: time-use; skill formation; cognitive and non-cognitive ability

JEL Classification: J13, J22, J24

Abstrakt

S použitím dat o využití času z longitudinálního průzkumu (pokrývajícího Etiopii, Indii a Vietnam), tato studie zkoumá, jak množství času tráveného dětmi různými aktivitami ovlivňuje získání kognitivních a nekognitivních schopností. Modelováním produkční funkce tvorby dovedností u dětí a rozšířením sady vstupů zahrnujících vlastní časové vstupy dítěte studie zjišťuje, že zapojení dítěte do pracovních činností, jako jsou domácí práce a placené činnosti, jsou spojeny se snížením jak kognitivních, tak nekognitivních výsledků. Výsledky studie naznačují, že existuje nepřímý nežádoucí vliv dětské práce na rozvoj dovedností prostřednictvím snížení hodin studia. Výsledky jsou konzistentní mezi všemi studovanými zeměmi jak pro malé děti, tak pro dorost. Tyto výsledky jsou také robustní na různé specifikace kontrol.

1 Introduction

Using time-diary data from a unique longitudinal survey, the present study examines how the amount of time children spend on different activities that are related to the acquisition of cognitive and noncognitive skills actually impact their development outcomes. In particular, the study addresses the questions: (*i*) what is the effect of time allocation across a wide range of alternative activities on achievement score (*ii*) is there a trade-off between these activities, (*iii*) does the time children spend on their own become more important as they grow into adolescence, and (*iv*) to what extent does child involvement in work activities (such as domestic chores, activities for pay outside of the household, and tasks on family business) lead to a reduction in achievement outcomes?

The human capital literature has empirically demonstrated that high-quality, early intervention helps to meet the diverse needs of young children during the crucial early years of life, enhances their readiness for schooling and improves later school achievements (Carneiro & Heckman, 2003; Cunha & Heckman, 2008). Skills measured at early ages are strongly correlated with subsequent life outcomes such as educational attainment, labor market outcomes, as well as psycho-social skills (Cameron & Heckman, 2001; Heckman, Stixrud & Urzua, 2006; Keane & Wolpin, 1997). There is also evidence that supports the notion that cognitive and noncognitive skills are shaped during the early stages of the life cycle and influenced by early interventions (Cunha & Heckman, 2008; Doyle, Harmon, Heckman & Tremblay, 2009). Even though there is a consensus among researchers regarding the critical nature of early life, little is known about the potentially enormous implications of these findings in the developing country context (Grantham-McGregor et al., 2007). There are also uncertainties about the type and timing of intervention and on how the gains are produced (Noboa-Hidalgo & Urzua, 2012).

A large body of literature discusses how child development responds to supply-side interventions (Currie, 2001); school inputs (Todd & Wolpin, 2007); parental investment (Carneiro & Heckman, 2003); and maternal employment (Ermisch & Francesconi, 2005). However, the role of the child's own investment has received very little attention. Most previous time-use research on children's activities focused on the time parents spend interacting with children, rather than on how these children themselves spend their time. It is imperative to shift attention to

how children spend their time as studies have shown that the human and social capital of childhood are built over time and through the activities in which children engage, as well as the quality of the resources and social interactions that surround them (Bianchi & Robinson, 1997).

There is a general agreement that children should not be doing any work that is clearly harmful, hazardous, or morally objectionable. However, in developing countries, child labor is still one of the most pervasive development problems. Child labor could potentially harm a child's physical, mental, and psychological development. It could also hinder human capital formation by crowding out the child's time devoted for education. In developing countries, most children's work takes place outside the formal employment sector. Much of it is found in the informal economy and, for girls, at home. The degree to which children's work interferes with school attendance and achievement outcome can vary greatly depending on the institutional structure of the sector of work and also on the structure of the school day (Assaad, Levison & Dang, 2005; Bhalotra & Tzannatos, 2003; Heady, 2003; Ravallion & Wodon, 2000). Studies have shown that many children who attend school also work on the farm or the street in developing countries (Akabayashi & Psacharopoulos, 1999). However, It is not clear, theoretically or empirically from the existing related literature, to what extent child work actually leads to the reduction of human capital development, especially when the children are engaged in household production (Akabayashi & Psacharopoulos, 1999).

The lack of empirical evidence with regard to children's own time investment could be attributed to two main limitations that researchers face: incomplete data on inputs and lack of a valid identification strategy. To illustrate the first problem, consider estimating a production function of skill acquisition on a selected vector of inputs. Causal statements on the impact of any of these inputs on skill formation are not plausible because the estimated effect of any input depends on what other inputs are omitted in the model. The second problem is equally vital as inputs into child development may be correlated with unobserved characteristics of parents and children such as genetics and the social environment. Child cognitive ability may itself influence the time allocation decision as smarter children tend to spend more time on cognition enhancing activities such as reading. Hence, any correlation between inputs and skill formation does not necessarily imply causal effect unless a valid estimation strategy is used.

There are only a few economics empirical papers that investigate the role of time-use on skill acquisition of children. A study by Cardoso et al. (2010) documents the link between time allocation by parents and by youngsters without analyzing the possible influence on skill formation. Agee et al. (2011) analyze the link between time-use and skill formation considering three home inputs (the time children spend reading, doing homework, and staying with family). Their study, however, does not distinguish between time spent by the children on their own and time spent with adult supervision. Fiorini and Keane (2014) study the effect of time allocation across a wide range of alternative activities using time diaries and document the cognitive and noncognitive implication of time allocation by children on a sample of Australian children. Del Boca et al. (2012) compare the impacts of time investments by parents and children on child cognitive outcomes of adolescents in the United States. Their analysis is limited to the cognitive skills of older children and constrained by a lack of lagged input data.

Almost all of the studies that cover developing countries investigate the causes and consequences of child labor with particular emphasis on its link with schooling (Bourguignon, Ferreira & Leite, 2003; Ravallion & Wodon, 2000; Skoufias, Parker, Behrman & Pessino, 2001). One exception is a study by Akabayashi and Psacharopoulos (1999), which investigates the degree to which there is a tradeoff between child labor and human capital formation of children from a Tanzanian household survey. Their analysis, however, is constrained by the fact that they use children's reading and mathematical skills as observed by household representatives as indicators of their human capital stock.

This paper, therefore, seeks to fill this gap in the literature by exploring the impact of time investment in different activities by children on their cognitive and psycho-social outcomes. To the author's knowledge, this is a first attempt at showing the link between children's and adolescents' own time allocation and their skill acquisition in a developing country setup. The study builds on earlier literature (Fiorini & Keane, 2014; Todd & Wolpin, 2007) by empirically testing an achievement production function that allows achievement at a given age to depend on the history of inputs as well as heritable endowments. The analysis in the study is based on a rich specification that controls for a host of confounding factors using child, household and community level survey information.

There are a number of distinct attributes to the study that make it a valuable addition to the current literature. It uses the *Young Lives* international survey

data which makes a rich specification possible as it includes detailed time-use information. This reduces the problem of estimation bias that arises from omitted inputs. Investigating the effect of a few inputs in isolation could only reveal limited or misleading information. By using time use data, this study documents a more extensive trade-off among the activities children perform since the cognitive effects of a particular activity vitally depend on the educational value of the alternative activities that it crowds out. For instance, long working hours leave working children with little time to spend elsewhere, including regular school attendance and studying, thereby adversely affecting their achievement outcome. In addition, the availability of data on younger and older cohort children makes it possible to compare the effect of young children's own time allocation with that of adolescents. This investigation sheds light on the debatable issue that investments in the achievement production function decrease with age.

The study takes the analysis a step further by probing whether or not a child's involvement in work activities results in a reduction in cognitive achievement. There is ample evidence regarding the causes of child labor in developing countries. However, by way of comparison, relatively little work has addressed the consequences of such work on children's skill formation. The study contributes to identifying this effect by presenting evidence from three countries, two cohorts and multiple achievement measures.

The results indicate that child involvement in work activities leads to a reduction in both cognitive and noncognitive achievement. For instance, an extra hour a week that a 15 year old child spends on family farm or business instead of at school would reduce her cognitive test scores by 0.15, 0.17 and 0.18 standard deviations in Ethiopia, India and Vietnam respectively. Time spent studying outside school on the other hand is found to be more productive in terms of skills acquisition. The results also indicate a trade-off between a child's development of cognitive skills and hours of work where hours of work are found to adversely affect cognitive achievements of children both directly and indirectly through the reduction of hours of study. These findings suggest that a reallocation of children's time towards studying and school by substituting away from the less productive work activities would complement the development of both cognitive and noncognitive skills. An hour a week spent on studying outside of school in Ethiopia is shown to have an equivalent effect on cognitive skills as one additional year of parental education. Comparing the effect of young children's own time allocation with that of adolescents, it is shown that the time input in work related

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activities by children in the younger cohort affect their test scores much more than the time input by the children in the older cohort. The results are all robust to different identification assumptions.

2 Methodology

The empirical analysis is based on a model of the production function for skill formation in the spirit of Todd and Wolpin (2003) and Cunha and Heckman (2008), but also adds investments made by the children themselves in addition to family and school inputs. The model specifies cognitive and noncognitive skills as a function of current and past inputs combined with the child's genetic endowment of mental capacity to produce cognitive and psycho-social outcomes.

An achievement production function, hence, relates cognitive or noncognitive achievement θ of child i residing in household j at age a with a vector of all inputs applied at any time up until age a, and the child's endowed mental capacity as

$$\theta_{ij,a} = f\big\{\theta_{ij,a-1}, X_{ij,a}^f, X_{ij,a}^c, X_{ij,a}^e, \mu_{ij,0}\big\}, \tag{1}$$

where $\theta_{ij,a-1}$ is previous period achievement, X_{ija}^f and X_{ija}^c represent parent-chosen inputs and their histories, and own investments by the child respectively; X_{ija}^e denotes exogenous inputs and their histories; and μ_{ij0} is the child's endowed mental capacity.

The empirical implementation of the production function in equation 1 is difficult since heritable endowments are unobservable, and inputs may be chosen endogenously with respect to unobserved endowments and prior realizations of achievement. This arises from the fact that parental input choices are often made consulting child-specific endowments, and in either a compensatory or reinforcing manner. The subsequent paragraphs discuss the different alternative econometric methods used in the literature to overcome this challenge and the associated benefits and drawbacks of these methods.

Linearizing the achievement production function in equation 1, a benchmark specification of the production function of skills relates an achievement measure solely to contemporaneous measures of inputs as

$$\theta_{ija} = \alpha + \gamma X_{ija}^c + \phi X_{ija}^f + \delta X_{ija}^e + \beta \mu_{ij0} + \varepsilon_{ija}. \tag{2}$$

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The implicit assumptions here are that only contemporaneous inputs matter for the production of current skills; current inputs capture the entire history of inputs as they are unchanging over time; and contemporaneous inputs are unrelated to unobserved ability (Todd & Wolpin, 2003). These strong assumptions can be relaxed by estimating a more robust, value-added specification that includes a lagged (baseline) achievement measure ($\theta_{ij,a-1}$) taken to be a sufficient statistic for unobserved input histories and endowment of mental capacity. Assuming the baseline achievement measure was conducted at period $a - 1$, the model is specified as

$$\theta_{ija} = \alpha + \gamma X_{ija}^c + \phi X_{ija}^f + \delta X_{ija}^e + \nu \theta_{ija-1} + \beta \mu_{ij0} + \varepsilon_{ija}. \tag{3}$$

This specification requires the effect of both observed and unobserved inputs as well as the endowed ability to decline with age.

It is possible, however, to relax the assumption that the effect of observed inputs decline with age by including additional regressors on lagged inputs if such information is available in the data. This helps enrich the value-added specification by incorporating observable lagged inputs in addition to the baseline achievement measure. Such a cumulative model can be specified as

$$\theta_{ija} = \alpha + \gamma_1 X_{ija}^c + \gamma_2 X_{ij,a-1}^c + \phi_1 X_{ija}^f + \phi_2 X_{ij,a-1}^f + \delta_1 X_{ija}^e$$
$$+ \delta_2 X_{ij,a-1}^e + \nu \theta_{ij,a-1} + \beta_a \mu_{ij0} + \varepsilon_{ija}. \tag{4}$$

The assumption required for this model is that any omitted inputs and measurement error in test scores are uncorrelated with included inputs.[1]

One way to get around the problem of endogeneity and further refine the empirical implementation is to specify fixed-effect estimation models. These specifications of the achievement production function allow input choices to be endogenous with respect to unobserved endowments. This study takes advantage of the fact that observations on achievement outcomes and on inputs for a given child at different ages are available in the dataset to estimate a within-child, fixed effects model. This specification is feasible because the children in the sample are observed more than once, and several outcome and input measurements are available.

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[1] For a detailed derivation and in-depth analysis of this model, see Todd and Wolpin (2003).

Differencing the achievement scores at two different ages, a and $a-1$, provides

$$\Delta\theta_{ija} = \Delta\gamma_1 X_{ija}^c + \Delta\gamma_2 X_{ij,a-1}^c + \Delta\phi_1 X_{ija}^f + \Delta\phi_2 X_{ij,a-1}^f$$
$$+ \Delta\delta_1 X_{ija}^e + \Delta\delta_2 X_{ij,a-1}^e + \Delta\beta_a\mu_{ij0} + \Delta\varepsilon_{ija}, \tag{5}$$

where ΔZ denotes the difference of the variable Z between two time periods (such as a and $a-1$, and $a-1$ and $a-2$). For a consistent estimation of equation 5, it is assumed that the impact of the endowment on achievement is independent of age, so that $\Delta\beta_a = (\beta_a - \beta_{a-1}) = 0$. It is also necessary to assume that later input choices are orthogonal to prior own achievement outcomes (Todd & Wolpin, 2007).

Each of the above specifications attempts to handle the problem of endogeneity in a different way, relying on different maintained assumptions. Researchers employ different mechanisms of choosing the best model that provides a robust result. Todd and Wolpin (2007) address the model selection problem by applying cross-validation criteria to find the model that performs best according to an out-of-sample, root-mean-squared error (RMSE) criterion. Cunha and Heckman (2008) propose an identification strategy that utilizes cross-equation covariance restrictions. Rather than choose a model of the best fit, Fiorini and Keane (2014) avoid the problem of model selection by trying to determine whether a ranking of inputs exists that is robust across the whole range of the most popular models used in the literature.

The present study uses six independent samples - three countries, two cohorts - to estimate cognitive and noncognitive production functions. Results from the nonnested estimators discussed above (OLS, value added, and within child fixed effects) are then presented given the assumptions under which each of these estimators identifies the production function. Consistent results from these independent samples is believed to reinforce the validity of the findings from these alternative methods. The sensitivity of the results to functional form assumptions is checked by re-estimating all models using specifications which allow for a non-linear effect of the time inputs.

3 Data

The data for this study are from the *Young Lives Project*, a study tracking the lives of children in four countries: Ethiopia, India (Andhra Pradesh district), Peru and Vietnam.[2] In each study country, the *Young Lives* surveys involve tracking 3,000 children in two cohorts (see Table 1). The younger cohort consists of 2,000 children who were born between January 2001 and May 2002. The older cohort consists of approximately 1,000 children from each country born in 1994-95.[3]

[Table 1 about here.]

This longitudinal survey consists of a survey of all 12,000 children and their primary caregivers every three years in three main elements: a child questionnaire, a household questionnaire, and a community questionnaire. The child questionnaire records detailed time-use data for all family members, anthropometric measures of children and their caregivers, and test scores of the children for school outcomes (language comprehension and maths). The survey also asks the children about their daily activities, their experiences and attitudes, feelings, perceptions, hopes and aspirations for the future. The household level data cover topics such as household composition, livelihood and assets, socio-economic status, social capital, economic changes and recent life history. This is supplemented with additional questions that cover caregiver perceptions, attitudes, and aspirations for their child and the family. In-depth information about the social, economic and environmental context of each community is provided by the community questionnaire.

Attrition in the samples is very low in all four countries for both younger and older cohort surveys. Attrition rates ranged from 2.2% (Vietnam) to 5.7% (Ethiopia) in the younger cohort, and from 2.4% (Vietnam) to 5.0% (Peru) in the older cohort (Barnett et al., 2012).

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[2]Access to the data and permission to use them for this study is granted by the UK Data Service. The last round of survey has not yet been publicly archived by the survey administrators. Data from Peru is not considered in this study as a large part of the time diary data was recorded with error.

[3]The data are clustered and cover 20 sites in each country across rural and urban areas. Sites were chosen purposively to reflect the diverse socio-economic conditions within the study countries and therefore are not statistically representative for the country: comparisons with representative datasets like the DHS samples do show however that in each of the countries, the data contain a similar range of variation as nationally representative datasets (Barnett et al., 2012).

3.1 *Cognitive and Noncognitive Measures*

The cognitive measures used in this study are a child's score on two standard achievement tests: namely, the Peabody Picture Vocabulary Test (PPVT) and a mathematics achievement test (MATH). The PPVT is a widely used test of receptive vocabulary. In the PPVT, the recipients hear a word (for example 'boat', 'lamp', 'cow' 'goat', etc.) in their mother tongue and are then asked to identify which of four pictures corresponds with the spoken word. The test is individually administered, untimed, norm-referenced and orally administered. It offers both raw scores as well as standard scores. The quantitative achievement score in the MATH test measures various numerical abilities appropriate for the age of the children.

In the case of the noncognitive indicators, self-esteem, self-efficacy and aspiration dimensions are chosen. These dimensions have been validated in the psychology literature and are correlated with economic and social outcomes later in life (Dercon & Sanchez, 2013). Self-esteem summarizes an overall evaluation of a child's own worth. Self-efficacy is related to a child's sense of agency or mastery over her own life. To measure these indicators, average scores were constructed based on the children's answers to a number of statements rated on the Likert-type scale. These questions include personality measures such as *friendliness, pride, determination, social trust,* and *group membership.* Answers to these statements (based on respondents degree of agreement or disagreement - ranging from strong agreement to strong disagreement) are used to construct individual average scores on self-efficacy and self-esteem. Aspiration is an indicator of the ability of the child to identify and set goals for the future, and be determined in the present to work towards achieving those goals (Dercon & Sanchez, 2013). This indicator is measured by asking the highest grade of education that the child hopes to complete.

3.2 *Time-Use Data*

The time-use diary documents all of the activities of the children over a 24-hour period on one randomly chosen weekday. For each child the diaries report the type of activity, where the activity took place, whether the child was supervised, and if the child chose to perform the activity. These activities are then grouped into the following eight major groups that are presumed to affect the children's

skills acquisition: Caring for others (younger siblings, elderly, ill household members); domestic chores (fetching water, firewood, cleaning, cooking, shopping); tasks at the family business (farm, cattle herding, other family business); activities for pay outside of household; at school; studying outside of school (including extra tutorship, and studying at home); play time/general leisure, and sleep.

[Figure 1 about here.]

Some notable patterns are evident in figure 1. First, Indian and Vietnamese children at the age of 5 years spend almost the entire weekly hours on sleep, leisure and school while their Ethiopian counterparts engage in some domestic work activities. This is mainly due to the rather low enrollment in preschool education in Ethiopia. This gap diminishes starting at age 8 when children are enrolled in primary education. Second, the time allocations across alternative activities remain largely unaltered for the older cohort between the ages of 12 and 15. In addition, a similar pattern of time use is witnessed by the younger cohort children at age 8. This is a clear indication that children in all the study countries start participating in domestic chores and work activities from as early as 8 years of age and continue to do so through their adolescent years.

This pattern is in contrast to what is observed in time diary data from developed countries. Table 2 illustrates this difference by comparing the major activities reported in the *Young Lives* data with two other time diary surveys from the United States and Australia. Work related activities such as tending to younger siblings or ailing older members of the family, domestic chores, tasks on the family business (farm), and in some instances paid work outside of the house are features of a routine daily activity for a child in a developing country but none of them are reported as a category in the time diary data from both the United States (Child Development Supplement of the Panel Study of Income Dynamics) and Australia (Longitudinal Study of Australian Children).

[Table 2 about here.]

3.3 *Trade-off Among Activities*

As one can observe from the numbers in figure 1, the children in the study sample spent several hours a week performing work activities. There is a general agreement that children should not be doing any work that is hazardous to their

wellbeing. However, there is less agreement about work that is not deemed problematic. Should children not work at all, or does work in moderation help in developing skills, confidence, and good habits?

Table 3 provides descriptive evidence on the link between time spent on work activities and children's cognitive and noncognitive outcomes. Though the degree to which children's work interferes with their skill development is not easily readable, the preliminary evidence indicates that work activities are associated with reduced achievement test scores. The table depicts the differences between average test scores of children that spend higher than average time on work activities and those spending a lower than average time. The results show that children working more hours score less in all of the achievement tests.

[Table 3 about here.]

Table 4 reports the difference between average number of hours in each activity by gender and place of residence. The columns labeled "Male" depict the difference in average weekly hours of time spent on the specific activity by gender where a positive magnitude indicates that boys spend more hours on that activity than girls. Similarly, the columns labeled "Rural" show the differences between urban and rural children where a positive difference indicates more hours worked by rural dwellers. Girls spend more time than boys in activities performed at home such as caring for others and household chores (14.6 hours more in Ethiopia, 10.3 more in India, and 4 hours more in Vietnam). On the other hand, boys are busier performing tasks on the family farm (business), spending on average 9.8, 3.7, and 2.4 more hours than girls in Ethiopia, India, and Vietnam respectively. Children residing in urban areas enjoy more leisure, study and school hours than their rural counterparts in all three countries.

[Table 4 about here.]

3.4 *Other Variables of Interest*

In addition to the key outcome variables, a host of explanatory and control variables such as community level measures, place of residence, household socio-economic characteristics (family size, wealth index, parental education, and social capital), and child specific measures (gender, birth order, anthropometry, child health, and social networks) are also included in the study. The wealth index

is made up of indicators from three dimensions: housing quality (characteristics of roof, wall, floor and number of rooms per person), ownership of consumer durables (such as radio, TV, fridge, bike, car) and access to services (electricity, drinking water, flush toilet and type of fuel used for cooking). The index ranges from 0 (worst) to 1 (best) possible outcomes in the three selected dimensions. Table 5 presents descriptive statistics of these additional variables using the wave 3 data for both cohorts.

[Table 5 about here.]

4   Estimation Results and Discussion

The empirical models specified in equations 2, 3, 4, and 5 (contemporaneous, value-added, cumulative, and within child fixed effects respectively), were estimated for all of the outcome variables. As each estimation method relies on different maintained assumptions, it is important to see a consistent trade-off among activities that is robust across different estimation methods. The main objective of this study is to estimate the effect of alternative overall time allocations on children's skill development instead of examining the role of only one or two time inputs in isolation.[4]

Tables A1 through A21 (in the appendix) report estimation results conducted for two outcome variables measuring cognitive skills and three outcome variables measuring noncognitive skills. Results are reported by country and separately for younger and older cohort samples. The figures reported in all of the tables are the standardized regression coefficients. The contemporaneous test scores and inputs are measured when the younger cohort children are 8 years of age and the older cohort 15 years old; while the lagged test scores and inputs are measured when the children are 5 and 12 years old.

4.1   *Cognitive Outcome*

The first research question the study attempts to address asks whether or not time allocation of children across a wide range of alternative activities has any

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[4]See Fiorini and Keane (2014) for a simple illustration of how analyzing few inputs in isolation conveys only partial and potentially misleading information as one cannot characterize the trade-off between inputs.

effect on achievement score, and if there is a trade-off among these activities. Tables A1 - A12 in the appendix present the detailed results for the cognitive production functions. Tables 6, 7, and 8 on the other hand, report summarized versions of the results to aid the exposition in this section. Since the time inputs are collinear, the category "time spent at school" is omitted. As a result, the effect of the remaining included inputs is to be interpreted relative to this category. The findings generally confirm the preliminary evidence presented in the previous section, where involvement in work activities was shown to be inversely related with improved achievement in cognitive skills.

[Table 6 about here.]

Tables 6 and 7 show the estimated coefficients for the PPVT and MATH test scores respectively for the older cohort sample. The results indicate that time spent performing tasks on the domestic farm and paid activities outside of the household are less productive in terms of skill production than the omitted category of time spent at school. For instance, according to the contemporaneous model, an extra hour spent on paid work by a 15 year old child would reduce PPVT (MATH) test scores by 0.13 (0.06) standard deviations in Ethiopia, 0.18 (0.19) in India, and 0.10 (0.22) in Vietnam. Similarly, the contemporaneous estimator suggests that 1 more hour a week spent on the family farm or business instead of at school would reduce PPVT scores by 0.15, 0.17 and 0.18 standard deviations in Ethiopia, India and Vietnam respectively. Time spent studying outside school (including extra tuition) are found to be more productive (in-terms of both PPVT and MATH test scores) for the Ethiopian sample of older cohort children. These coefficients are mostly statistically insignificant for the Indian and Vietnamese sample. Time spent sleeping and on leisure activities, in almost all instances, is found to be less productive than time spent at school. This is to be expected, however, as it is difficult to increase test scores by substituting all sleep and leisure time with school time.

The importance of own time allocation by children is amplified when it is put in perspective relative to some background variables. In the Ethiopian sample, for example, the contemporaneous estimator suggests that an hour a week spent on studying outside of school has an equivalent effect on cognitive skills as one additional year of parental education. Both variables produce 0.08 standard deviation increase in the PPVT test scores. Similarly, an extra hour a week that a child spends caring for others is equally pernicious to PPVT scores as having

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one more sibling in the household.

[Table 7 about here.]

The contemporaneous estimator is consistent only under some strong assumptions. Causal relationship of cognitive skills and invested inputs can be established if only contemporaneous inputs matter to the production of current achievement; or if inputs are unchanging over time, so that current input measures capture the entire history of inputs. In addition, contemporaneous inputs must be unrelated to (unobserved) endowed mental capacity. The assumption that inputs are unchanging over time is not as restrictive for the samples considered as is otherwise envisaged. The descriptive statistics in the previous section (figure 1) shows that time allocation across activities by the children remained similar between the two waves of survey. The added covariates and the consistency of the results across all three samples and for both cognitive measures also make a strong case in supporting the claim that child activities are counterproductive.

The results also remain largely unaffected when a value-added specification was estimated with the inclusion of the baseline achievement measure, which is taken to be a sufficient statistic for unobserved input histories as well as the unobserved innate capacity. The lagged test score is found to be highly statistically significant; and its inclusion improved the R^2 while the magnitudes of the coefficients are slightly smaller. These results are also consistent for the cumulative specification with lagged inputs and a baseline test score. This specification expands the contemporaneous specification to include observable lagged inputs, but it maintains the assumption that any omitted inputs and endowments are orthogonal to the included inputs.

The lagged test scores in the value-added and cumulative models are included as a measure of the correlation between the contemporaneous and lagged test (controlling for other covariates) and to assess whether a lower score at the present period may imply reduced cognitive achievements in the future. The coefficients for the lagged test are always very significant for all the samples considered and across all the estimation models, suggesting a very high persistence in the test score results. The coefficients of the other lagged inputs are also found to be mostly significant, and their inclusion improved the R^2s of the models. The fixed effects estimates yield different results for the PPVT production function as some of the activities were found to be positively correlated with test scores

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contrary to our prior. It proved difficult to read too much into these results, however, as the PPVT scores were corrected slightly differently in the wave 2 and wave 3 dataset, rendering the first differenced results from the fixed effects estimations imprecise.

The estimation results also report the role of several control variables used in the study (tables A1 - A12). Among these covariates are the child's gender, height-for-age z-score, wealth index, household composition, parental education and place of residence. Female children are found to consistently score lower in both cognitive skill tests. According to the cumulative specification, being a girl reduces PPVT (MATH) scores by 0.15 (0.10), 0.17 (0.15) and 0.05 (0.09) standard deviations in Ethiopia, India and Vietnam respectively. Wealth index and the child's nutritional status, measured by height-for-age z-scores, also seem to matter as almost all the estimation results produce highly significant positive coefficients. The same pattern is observed regarding place of residence, as urban dwellers perform better than their rural counterparts. Having more siblings is shown to adversely affect both PPVT and MATH scores of the younger cohort children. The presence of a grandparent in the household seem to produce mixed results that are mostly statistically insignificant. Parental education is found to be highly significant in most of the samples considered. All the estimators suggest that an additional year of mothers' education results in a 0.07 - 0.12 standard deviations increase in both PPVT and MATH test scores.

Comparing the estimation results for the younger and older children, it can be seen that the time investments by children in the younger cohort (aged 8) affect their test scores much more than the time input by their older counterparts (aged 15). The time inputs spent on work related activities resulted in larger negative effects on the younger children's test outcomes. These findings support the notion that returns on investments in early childhood are larger than those on investments at later stages.

[Table 8 about here.]

4.2   *Noncognitive Outcome*

Tables A13 - A21 in the appendix show the results for the noncognitive measures in detail. A summary of the results is presented in tables 9 - 11 below. These psychosocial indices are constructed such that a higher score means better non-

cognitive competency. Because of the age-period in which the sampled children are observed, the noncognitive tests were considered only for the older cohort sample. The findings for the noncognitive skill indicators largely reinforce those for cognitive skills.

[Table 9 about here.]

Involvement in paid activities and time spent on caring for others as well as on family business are found to be counterproductive in building self-esteem and self-efficacy skills as well as shaping educational aspirations of children. An extra hour a week that a child invests on paid activities instead of at school is found to reduce her self-esteem, self-efficacy, and educational aspiration skills by 0.08, 0.07 and 0.22 standard deviations respectively in Ethiopia. Similar significant adverse effects are found for the Indian and Vietnamese samples as well. These results are consistent across the contemporaneous, value added and cumulative estimators. Time inputs invested in domestic chores and on family business are all significantly negatively related to self-efficacy and educational aspirations of children.

[Table 10 about here.]

Noncognitive skills are associated with positive outcomes for young people, according to a large body of research (See Almlund, Duckworth, Heckman & Kautz, 2011, for a review of the related literature). Personality skills such as self-control and school engagement are correlated with academic and labor market outcomes, and reduced crime (Almlund et al., 2011). However, robust evidence of a causal relationship is quite limited in the literature. Less is known about the mechanisms through which one develops noncognitive skills. Thus, it is likely that the results presented in his section could be informative of an underlying relationship between the time investments of children and the formation of noncognitive skills. It proved extremely difficult, however, to compare and contrast the findings with the literature. The possible implications of children's own time investments on the acquisition of noncognitive skills has received little attention within the human capital formation literature in economics. In the only other study that showed the link between time investments and noncognitive skills, Fiorini and Keane (2014) find noncognitive skills to be insensitive to the allocation of childrens time. Instead they find that noncognitive skills are strongly influenced by

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parenting style, specifically effective discipline and warmth.[5]

<div align="center">[Table 11 about here.]</div>

4.3   *Trade-off Between Child Work and Skill Formation*

The empirical evidence presented in the previous section makes a strong case about the existence of possible trade-offs among time inputs of children. In this section, the study tries to further probe the extent to which child involvement in work activities (such as domestic chores, activities for pay outside of household, and tasks on family business) leads to a reduction in cognitive achievement. The determinants of children's hours of work, hours of leisure and hours of study as well as the trade-off, if any, among the three activities is also investigated.

Child labor is often defined as work that impairs the normal development of working children. For the purpose of this study, the term "child work" is broadly defined as any non-leisure activity other than schooling and studying. To this effect, the eight time categories specified in previous sections are regrouped into three classes of activities: hours of work, hours of study and hours of leisure. Time spent on caring for others, household chores, activities at the family business or farm and paid activities outside home are classified under "hours of work". The time children spend sleeping, playing, and on general leisure are grouped under "hours of leisure"; while time spent at school, studying at home (including extra tuition) are merged under "hours of study".

Table 12 reports the estimation results of the PPVT and MATH achievement scores on a set of explanatory variables including hours of work (column 1 and column 3) and then adding hours of study (column 2 and column 4). The results imply that there tends to be a trade-off between a child's development of cognitive skills and hours of work. The addition of the hours of study variable substantially lowers both the magnitude and the significance level of the effect that hours of work have on skill development measured by both PPVT and MATH scores. These results imply that there is an indirect adverse effects of child work on skill development through the reduction of hours of study. For instance, an extra hour a week that a 15 year old child spends working results in a 0.14 (0.12) and 0.31

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[5]Fiorini and Keane (2014) conducted their studies on a sample of Australian children. As indicated in table 2 the pattern of time allocation of the children in their sample is quite different from the ones considered in this paper.

(0.34) standard deviation reduction in PPVT (MATH) test scores due to forgone hours of study in Ethiopia and India respectively. No such trend is observed for the Vietnamese sample, though hours of study are found to affect achievement scores positively. These results are in line with the descriptive evidence presented in section 2 (see figure 1) where children in Vietnam are shown to spend less time on child work than their Ethiopian and Indian counterparts.

[Table 12 about here.]

4.4 *Heterogeneity and Sensitivity Checks*

A re-estimation of all the models for boys and girls separately, however, did not produce large differences between boys and girls. The results are similar to those obtained using the whole sample. When we re-estimate all the models separately by wealth status (below/above average wealth index) and by place of residence (urban/rural), engaging in work activities results in negative cognitive outcomes in urban areas (compared to the whole sample and the rural sub-sample). There are no noticeable differences between households with below (above) average wealth status.

As a sensitivity check, the robustness of the results was further tested to functional form assumptions by re-estimating all the models using specifications which allow for a non-linear effect of the time inputs (such as logarithmic form and including second degree polynomials in time inputs). The replicated estimation for the log form of test scores gave results that are very similar to the original linear regressions for both PPVT and MATH outcomes. When the models are re-estimated using a second degree polynomial in the time inputs, the results yield slightly improved adjusted R^2 and coefficients that are marginally bigger in magnitude.

5   Conclusion

A large body of literature discusses how child development responds to supply-side interventions, parental investment and other exogenous inputs. However, the literature is scant on the role of children's self-investment on their development outcomes, particularly in a developing country set-up. Exploiting a unique

dataset from three developing countries, this study presents compelling empirical evidence of the existence of a possible trade-off among time inputs of children in determining their cognitive and noncognitive development. The study employs a time-use data reflecting how children spend a given representative week to present a much richer specification of the achievement production function where the effects of all time inputs are examined simultaneously.

The results indicate that child involvement in work activities leads to a reduction in cognitive achievement, while time spent at school, and studying outside school (including extra tuition) are found to be more productive in terms of skill acquisition. Performing paid activities and working on family businesses are negatively related to cognitive outcomes. Spending one more hour a week in school rather than doing paid activities has the same positive effect on cognitive skill as one year of parental education. Time spent on household chores is found to be counterproductive to MATH test scores; but has no significant effect on PPVT scores. The results are mostly consistent for all the samples considered (both young and older cohorts in the three study countries). The results further imply that there tends to be a trade-off between a child's development of cognitive skills and hours of work. Hours of work are found to adversely affect cognitive achievements of children both directly and indirectly through the reduction of hours of study.

The study also compared the effect of young children's own time allocation with that of adolescents. Looking at the estimation results for the younger and older children, it was shown that the time input in work related activities by children in the younger cohort affect their test scores much more than the time input by the children in the older cohort. These findings support the notion that returns on investments in early childhood are larger than those on investments at later stages.

The findings for the noncognitive skill indicators largely corroborate those of cognitive skills. Time allocation on alternative activities has a different effect on self-esteem and self-efficacy outcomes in different countries. In the Vietnamese sample, involvement in paid activities and time spent on caring for others as well as at the family business are found to be counterproductive in building self-esteem and self-efficacy skills. The results for the aspiration production function, however, are comparable to that of the cognitive outcomes for all three countries, as time inputs invested in paid activities, domestic chores and on

family business are found to be significantly negatively related to educational aspirations of children.

A host of control variables were used in the estimations to account for potential endogeneity problems. Of these covariates, the coefficients for lagged test are always very significant, suggesting a very high persistence in the test score results. Female children are found to consistently score lower in both cognitive skill tests. Higher wealth index and residence in urban areas, as well as better height-for-age z scores are all associated with better test scores. For the younger cohort sample, a higher number of siblings is linked with reduced PPVT and MATH scores.

The findings indicate the need for a reallocation of children's time and other inputs. The fact that the study uses data from developing countries representing three different societies makes the evidence quite compelling. However, further studies are required to make an in-depth investigation of the detrimental consequences of child labor on the skill acquisition of children.

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Figure 1: Weekly Time Allocation Across Alternative Activities, by Age
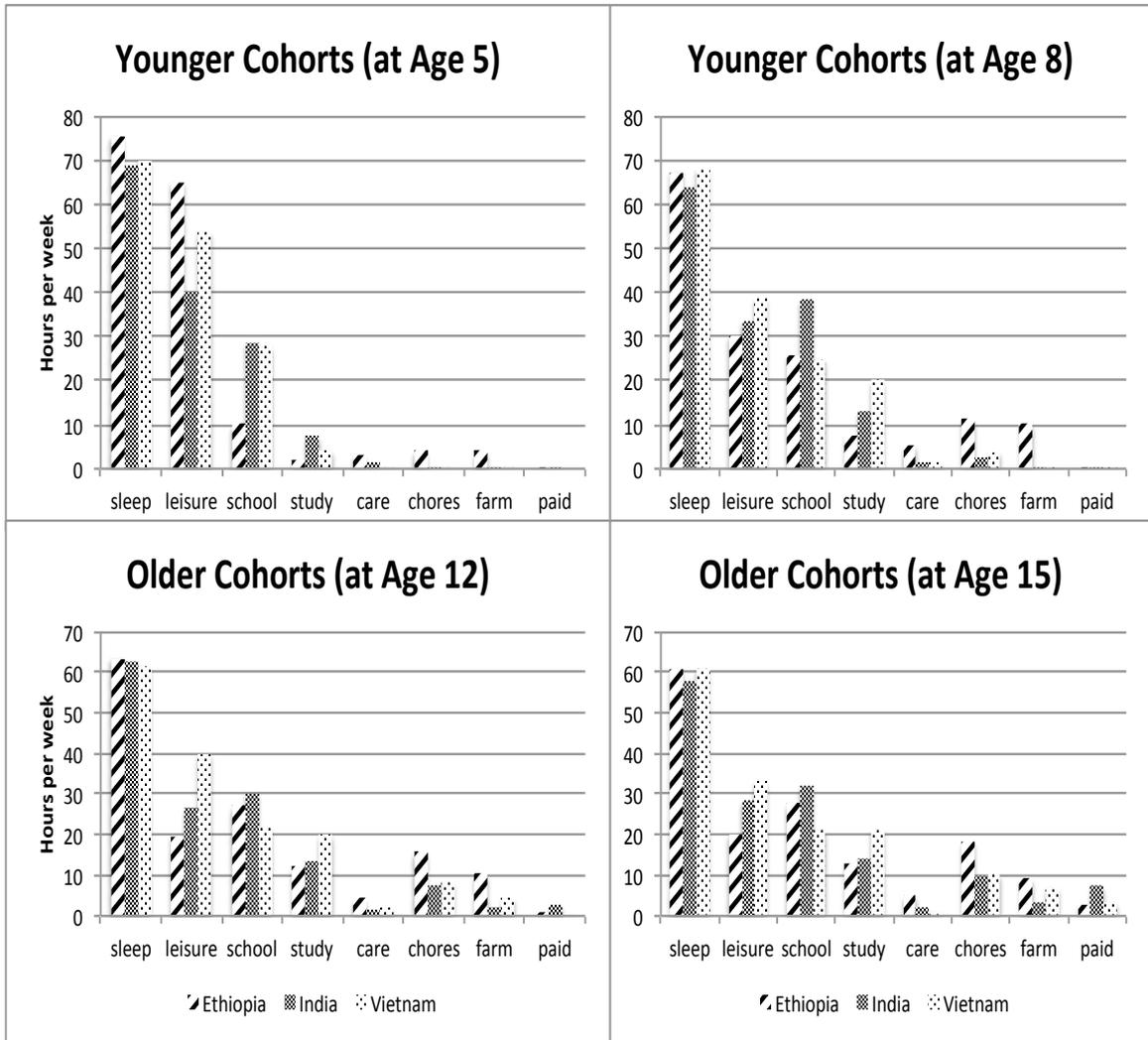
Table 1: Younglives Survey: Age at Interview

	Year	Younger Cohort	Older cohort
Round 1 survey	2002	6 to 18 months	7 to 8 years
Round 2 survey	2006	4 to 5 years	11 to 12 years
Round 3 survey	2009	7 to 8 years	14 to 15 years
Round 4 survey	2013	11 to 12 years	18 to 19 years

Table 2: Comparison of Children's Time Allocation

Young Lives	Australia - LSAC[1]	USA - CDS[2]
Sleep	Sleep	Reading
School	Day Care/School	Homework
Studying (outside of school)	Educational activities	Playing
Leisure	Other Educ. activities	Arts and craft
Caring for others	General Care (parents)	Sport
Domestic chores	General Care	Attending performances
Tasks on family farm	Media	Attending museums
Paid activities	Social activities	Religious activity

Notes: [1]Longitudinal Study of Australian Children, source Fiorini and Keane (2014); [2]Child Development Supplement of the Panel Study of Income Dynamics, source Del Boca et al. (2012).

Table 3: Differences in Average Test Scores by Time Inputs: Work Activities

	Ethiopia		India		Vietnam	
	Older Cohorts					
PPVT	-0.670***	(-10.61)	-0.947***	(-13.86)	-0.616***	(-8.83)
MATH	-0.475***	(-7.35)	-0.978***	(-14.97)	-0.754***	(-11.25)
Self-esteem	-0.327***	(-4.99)	-0.171*	(-2.37)	-0.380***	(-5.4)
Self-efficacy	-0.283***	(-4.3)	-0.682***	(-9.86)	-0.463***	(-6.63)
Aspiration	-0.266***	(-4.02)	-1.117***	(-17.32)	-0.949***	(-14.6)
Observations	972		963		921	
	Younger Cohorts					
PPVT	-0.789***	(-18.42)	-0.181***	(-3.81)	-0.146**	(-3.01)
MATH	-0.802***	(-18.56)	-0.161***	(-3.4)	-0.101*	(-2.16)
Observations	1875		1899		1824	

Notes: Two sided t test for $H_0 : Difference = 0$; t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; test scores are standardized to have mean 0 and standard deviation 1.

Table 4: Differences in Average Time by Gender and Place

	Ethiopia		India		Vietnam	
	Male	Rural	Male	Rural	Male	Rural
Sleep	-0.16	0.80	0.36	-0.05	3.23***	-1.28
Care	-2.97***	1.34**	-2.39***	0.77	-0.79**	-0.14
Chores	-11.62***	2.50***	-8.01***	3.74***	-2.28***	0.98
Farm/Buisness	12.17***	9.82***	0.25	3.66***	2.42*	7.56***
Paid	1.03	0.38	0.71	2.50	0.41	2.12
School	-2.00**	-5.54***	3.263**	-5.17***	-1.60*	-2.54**
Study	0.83	-3.51***	1.59*	-2.87***	-4.06***	-6.29***
Leisure	3.73***	-3.39***	2.90**	-0.57	3.62***	1.71
N	971		962		921	

Notes: Two sided t test for $H_0 : Difference = 0$; t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; "Male" denotes the difference in average weekly hours of time spent on the specific activity by gender, "Rural" shows the difference between urban and rural children.

Table 5: Descriptive Statistics of Major Indicators (Wave 3 data)

Variable	Ethiopia		India		Vietnam	
	mean	sd	mean	sd	mean	sd
Older Cohort						
Child is female	0.488	0.500	0.506	0.500	0.506	0.500
Both parents are alive	0.793	0.406	0.882	0.323		
Grandparents present at home	0.103	0.304	0.227	0.419	0.159	0.366
Number of siblings	3.306	1.870	1.740	1.373	1.434	1.161
Wealth index of the household	0.350	0.167	0.522	0.174	0.623	0.184
Height for age z-score of child	-1.371	1.286	-1.661	1.056	-1.427	0.914
Household size	6.352	2.120	5.051	1.909	4.542	1.357
Resides in urban area	0.414	0.493	0.564	4.958	0.194	0.395
Younger Cohort						
Child is female	0.472	0.499	0.465	0.499	0.488	0.500
Both parents are alive	0.914	0.281	0.960	0.197	0.973	0.161
Grandparents present at home	0.210	0.416	0.624	0.613	0.450	0.588
Number of siblings	3.540	2.152	1.880	1.442	1.442	1.181
Wealth index of the household	0.329	0.175	0.514	0.178	0.608	0.189
Height for age z-score of child	-1.200	1.200	-1.425	1.182	-1.100	1.073
Household size	6.194	1.980	5.441	2.264	4.613	1.391
Resides in urban area	0.397	0.489	0.930	7.184	0.212	0.409

Table 6: Cognitive Production Model Results: PPVT, Older Cohort

	CT	VA	CUM Wave 3	CUM Wave 2	FE
Ethiopia					
Sleep	-0.032	0.001	0.003	0.022	-0.201***
	(0.036)	(0.034)	(0.036)	(0.035)	(0.040)
Caring for others	-0.080**	-0.024	0.000	-0.061*	0.137***
	(0.040)	(0.037)	(0.038)	(0.033)	(0.041)
Domestic chores	-0.012	0.030	0.060	-0.079**	0.269***
	(0.039)	(0.038)	(0.041)	(0.035)	(0.045)
Farm/business	-0.150***	-0.104**	-0.060	-0.132***	0.133**
	(0.044)	(0.043)	(0.045)	(0.050)	(0.054)
Paid activities	-0.125***	-0.069*	-0.048	-0.057	0.127***
	(0.043)	(0.039)	(0.038)	(0.046)	(0.033)
Studying	0.080**	0.054	0.076**	-0.050	0.204***
	(0.038)	(0.036)	(0.037)	(0.032)	(0.044)
Leisure	-0.068*	-0.027	-0.026	-0.081**	0.115***
	(0.038)	(0.037)	(0.037)	(0.036)	(0.038)
Constant	-0.050	-0.012	-0.017		0.000
	(0.030)	(0.029)	(0.029)		(0.000)
Observations	812	786	784		1,782
Adjusted R^2	0.307	0.332	0.346		0.260
India					
Sleep	-0.198***	-0.132***	-0.133***	-0.057**	-0.232***
	(0.033)	(0.032)	(0.032)	(0.028)	(0.029)
Caring for others	-0.057*	-0.052	-0.044	-0.007	-0.014
	(0.029)	(0.032)	(0.033)	(0.024)	(0.029)
Domestic chores	-0.046	0.002	0.003	-0.066**	0.147***
	(0.033)	(0.031)	(0.033)	(0.029)	(0.031)
Farm/business	-0.177***	-0.113***	-0.096***	-0.043	0.041
	(0.032)	(0.032)	(0.036)	(0.029)	(0.035)
Paid activities	-0.185***	-0.096***	-0.063*	-0.097***	0.127***
	(0.036)	(0.033)	(0.037)	(0.034)	(0.033)
Studying	0.016	0.005	0.002	-0.066*	0.195***
	(0.048)	(0.044)	(0.047)	(0.037)	(0.043)
Leisure	-0.098***	-0.086**	-0.081**	-0.061**	0.072**
	(0.036)	(0.035)	(0.034)	(0.030)	(0.032)
Constant	0.051*	0.045*	0.047		-0.000
	(0.027)	(0.025)	(0.025)		(0.000)
Observations	846	834	817		1,602
Adjusted R^2	0.354	0.444	0.450		0.244
Vietnam					
Sleep	-0.053	-0.023	-0.020	-0.070*	-0.053*
	(0.037)	(0.036)	(0.035)	(0.041)	(0.031)
Caring for others	-0.001	-0.001	-0.004	-0.060**	-0.050*
	(0.030)	(0.028)	(0.028)	(0.029)	(0.030)
Domestic chores	0.049	0.057*	0.066*	-0.056	0.017
	(0.037)	(0.034)	(0.035)	(0.036)	(0.030)
Farm/business	-0.183***	-0.142***	-0.094*	-0.149***	0.096**
	(0.055)	(0.055)	(0.057)	(0.048)	(0.046)
Paid activities	-0.099*	-0.075	-0.056	0.084*	-0.025
	(0.053)	(0.051)	(0.050)	(0.045)	(0.034)
Studying	-0.033	-0.025	0.004	-0.158***	0.031
	(0.064)	(0.061)	(0.061)	(0.059)	(0.048)
Leisure	-0.098**	-0.065	-0.047	-0.179***	-0.010
	(0.047)	(0.046)	(0.045)	(0.059)	(0.036)
Constant	-0.012	-0.008	-0.006		-0.000***
	(0.029)	(0.028)	(0.028)		(0.000)
Observations	796	792	790		1,578
Adjusted R^2	0.353	0.396	0.413		0.125

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; robust standard errors in parentheses. Coefficients are standardized to have mean 0 and standard deviation 1. Controls include: gender of child, grandparent present at home, number of siblings, urban dummy, wealth index, height-for-age z-score, and parental education in years. Column names refer to estimation results from different models: CT - Contemporaneous; VA- Value-added; CUM.- Cumulative; FE- Fixed effects. Wave 3 and wave 2 values in FE and CUM, lagged test scores used in VA and CUM.

Table 7: Cognitive Production Model Results: MATH, Older Cohort

	CT	VA	CUM Wave 3	CUM Wave 2	FE
Ethiopia					
Sleep	-0.096***	-0.098***	-0.074**	-0.072**	-0.006
	(0.035)	(0.035)	(0.036)	(0.036)	(0.031)
Caring for others	-0.073**	-0.053*	-0.031	-0.082**	-0.005
	(0.031)	(0.031)	(0.032)	(0.033)	(0.029)
Domestic chores	-0.082**	-0.050	-0.025	-0.086***	-0.055*
	(0.037)	(0.038)	(0.039)	(0.033)	(0.032)
Farm/business	-0.058	-0.017	0.004	-0.096*	0.025
	(0.044)	(0.043)	(0.045)	(0.049)	(0.040)
Paid activities	-0.060*	-0.042	-0.013	-0.042*	-0.055**
	(0.032)	(0.031)	(0.031)	(0.024)	(0.023)
Studying	0.212***	0.223***	0.210***	0.058	0.055
	(0.053)	(0.052)	(0.051)	(0.043)	(0.036)
Leisure	-0.113***	-0.089**	-0.083**	-0.060	-0.062**
	(0.037)	(0.036)	(0.034)	(0.037)	(0.028)
Constant	-0.001	0.008	0.009		0.000***
	(0.028)	(0.028)	(0.028)		(0.000)
Observations	965	939	936		1,782
Adjusted R^2	0.221	0.270	0.290		0.035
India					
Sleep	-0.179***	-0.132***	-0.121***	-0.063**	-0.181***
	(0.031)	(0.031)	(0.031)	(0.025)	(0.030)
Caring for others	-0.064***	-0.052**	-0.046**	0.008	-0.043*
	(0.020)	(0.020)	(0.021)	(0.019)	(0.025)
Domestic chores	-0.091***	-0.076***	-0.096***	0.001	0.026
	(0.027)	(0.026)	(0.027)	(0.026)	(0.030)
Farm/business	-0.144***	-0.118***	-0.101***	-0.024	-0.044*
	(0.021)	(0.020)	(0.023)	(0.018)	(0.025)
Paid activities	-0.194***	-0.154***	-0.123***	-0.047**	-0.043
	(0.030)	(0.030)	(0.034)	(0.021)	(0.031)
Studying	0.055	0.038	0.014	0.033	0.146***
	(0.048)	(0.047)	(0.048)	(0.032)	(0.046)
Leisure	-0.106***	-0.095***	-0.089***	-0.050*	0.013
	(0.029)	(0.030)	(0.030)	(0.028)	(0.030)
Constant	0.001	0.003	0.003		-0.000**
	(0.025)	(0.025)	(0.025)		(0.000)
Observations	960	941	920		1,602
Adjusted R^2	0.377	0.430	0.437		0.096
Vietnam					
Sleep	-0.089**	-0.105***	-0.089**	-0.091**	-0.122***
	(0.036)	(0.036)	(0.037)	(0.038)	(0.038)
Caring for others	-0.072**	-0.064**	-0.070**	-0.039	-0.185***
	(0.030)	(0.029)	(0.029)	(0.030)	(0.033)
Domestic chores	-0.071**	-0.081***	-0.057*	-0.128***	0.049
	(0.030)	(0.029)	(0.029)	(0.036)	(0.037)
Farm/business	-0.185***	-0.160***	-0.115**	-0.151***	-0.064
	(0.042)	(0.044)	(0.047)	(0.045)	(0.044)
Paid activities	-0.217***	-0.227***	-0.198***	-0.039**	-0.092**
	(0.044)	(0.042)	(0.042)	(0.018)	(0.040)
Studying	-0.075	-0.077	-0.033	-0.220***	-0.046
	(0.067)	(0.068)	(0.068)	(0.059)	(0.068)
Leisure	-0.243***	-0.218***	-0.195***	-0.211***	-0.328***
	(0.044)	(0.043)	(0.044)	(0.058)	(0.052)
Constant	0.012	0.015	0.020		0.000
	(0.027)	(0.027)	(0.027)		(0.000)
Observations	851	813	809		1,578
Adjusted R^2	0.354	0.394	0.407		0.454

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; robust standard errors in parentheses. Coefficients are standardized to have mean 0 and standard deviation 1. Controls include: gender of child, grandparent present at home, number of siblings, urban dummy, wealth index, height-for-age z-score, and parental education in years. Column names refer to estimation results from different models: CT - Contemporaneous; VA- Value-added; CUM.- Cumulative; FE- Fixed effects. Wave 3 and wave 2 values in FE and CUM, lagged test scores used in VA and CUM.

Table 8: Cognitive Production Model Results: PPVT, Younger Cohort

	CT	VA	CUM Wave 3	CUM Wave 2	FE
Ethiopia					
Sleep	-0.048**	-0.044**	0.013	0.003	-0.194***
	(0.021)	(0.021)	(0.029)	(0.032)	(0.035)
Caring for others	-0.096***	-0.090***	-0.058*	-0.058*	-0.027
	(0.020)	(0.020)	(0.032)	(0.030)	(0.026)
Domestic chores	-0.060***	-0.055***	-0.102***	-0.047	0.169***
	(0.021)	(0.021)	(0.030)	(0.031)	(0.035)
Farm/business	-0.139***	-0.134***	-0.148***	-0.072**	-0.046
	(0.026)	(0.026)	(0.035)	(0.035)	(0.034)
Paid activities	-0.018	-0.009	-0.021***	-0.032***	-0.032*
	(0.013)	(0.013)	(0.006)	(0.006)	(0.017)
Studying	0.076***	0.088***	0.065*	0.081	0.259***
	(0.029)	(0.029)	(0.036)	(0.055)	(0.043)
Leisure	-0.169***	-0.152***	-0.167***	-0.130**	-0.163***
	(0.024)	(0.024)	(0.036)	(0.058)	(0.050)
Constant	-0.020	-0.018	0.092***		0.000*
	(0.019)	(0.019)	(0.026)		(0.000)
Observations	1,640	1,626	864		1,886
Adjusted R^2	0.376	0.398	0.413		0.497
India					
Sleep	-0.092***	-0.089***	-0.053**	-0.075***	-0.149***
	(0.027)	(0.027)	(0.027)	(0.025)	(0.026)
Caring for others	-0.026	-0.035*	-0.011	-0.020	0.025
	(0.019)	(0.019)	(0.019)	(0.017)	(0.019)
Domestic chores	-0.053**	-0.055**	-0.019	-0.011	0.161***
	(0.022)	(0.022)	(0.023)	(0.022)	(0.023)
Farm/business	-0.028***	-0.025***	-0.024***	-0.014***	-0.015
	(0.009)	(0.007)	(0.006)	(0.003)	(0.011)
Paid activities	-0.037	-0.033	-0.030	0.047***	-0.014
	(0.044)	(0.040)	(0.041)	(0.002)	(0.027)
Studying	0.051	0.053*	0.067**	-0.000	0.313***
	(0.032)	(0.032)	(0.032)	(0.027)	(0.032)
Leisure	-0.032	-0.016	0.042	-0.087***	0.163***
	(0.030)	(0.030)	(0.030)	(0.026)	(0.027)
Constant	-0.001	-0.001	-0.002		0.000***
	(0.021)	(0.021)	(0.022)		(0.000)
Observations	1,870	1,860	1,671		3,126
Adjusted R^2	0.145	0.171	0.198		0.293
Vietnam					
Sleep	-0.048*	-0.053**	-0.039	-0.021	-0.035
	(0.025)	(0.025)	(0.026)	(0.023)	(0.022)
Caring for others	0.011	0.014	0.025	-0.014	-0.000
	(0.023)	(0.022)	(0.026)	(0.021)	(0.022)
Domestic chores	0.024	0.027	0.033	-0.029	0.200***
	(0.024)	(0.024)	(0.025)	(0.018)	(0.022)
Farm/business	-0.041*	-0.036*	-0.023	0.022***	-0.001
	(0.022)	(0.021)	(0.026)	(0.006)	(0.018)
Paid activities	0.025***	0.029***	0.029***		0.024
	(0.008)	(0.011)	(0.010)		(0.022)
Studying	0.181***	0.164***	0.135***	0.051**	0.419***
	(0.031)	(0.031)	(0.035)	(0.023)	(0.021)
Leisure	0.047	0.054*	0.076**	-0.083***	-0.068***
	(0.032)	(0.032)	(0.035)	(0.031)	(0.024)
Constant	0.009	-0.001	0.012		0.000***
	(0.021)	(0.021)	(0.021)		(0.000)
Observations	1,598	1,551	1,376		2,576
Adjusted R^2	0.310	0.322	0.315		0.701

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; robust standard errors in parentheses. Coefficients are standardized to have mean 0 and standard deviation 1. Controls include: gender of child, grandparent present at home, number of siblings, urban dummy, wealth index, height-for-age z-score, and parental education in years. Column names refer to estimation results from different models: CT - Contemporaneous; VA- Value-added; CUM.- Cumulative; FE- Fixed effects. Wave 3 and wave 2 values in FE and CUM, lagged test scores used in VA and CUM.

Table 9: noncognitive Production Model Results: Self-esteem

	CT	VA	CUM Wave 3	CUM Wave 2	FE
Ethiopia					
Sleep	0.139***	0.135***	0.116***	0.077*	-0.227***
	(0.041)	(0.041)	(0.043)	(0.042)	(0.046)
Caring for others	0.005	0.008	0.017	-0.003	0.173***
	(0.039)	(0.039)	(0.042)	(0.038)	(0.045)
Domestic chores	0.020	0.026	0.037	-0.058	0.352***
	(0.049)	(0.048)	(0.049)	(0.045)	(0.050)
Farm/business	0.034	0.034	0.014	0.061	0.118**
	(0.052)	(0.052)	(0.054)	(0.055)	(0.057)
Paid activities	-0.074**	-0.075**	-0.051	-0.051	0.180***
	(0.037)	(0.038)	(0.039)	(0.037)	(0.034)
Studying	0.139***	0.135***	0.135***	0.042	0.200***
	(0.048)	(0.048)	(0.048)	(0.040)	(0.052)
Leisure	-0.077*	-0.076*	-0.087**	0.045	0.048
	(0.041)	(0.041)	(0.042)	(0.042)	(0.044)
Constant	-0.004	0.001	0.003		0.000***
	(0.034)	(0.034)	(0.034)		(0.000)
Observations	819	818	816		1,782
Adjusted R^2	0.098	0.099	0.106		0.269
India					
Sleep	0.036	0.038	0.052	0.035	-0.435***
	(0.039)	(0.039)	(0.039)	(0.032)	(0.035)
Caring for others	-0.035	-0.034	-0.053	-0.001	0.030
	(0.030)	(0.030)	(0.033)	(0.028)	(0.037)
Domestic chores	0.078**	0.078**	0.098***	0.016	0.334***
	(0.033)	(0.033)	(0.033)	(0.036)	(0.044)
Farm/business	-0.034	-0.032	0.021	-0.040	0.167***
	(0.042)	(0.042)	(0.045)	(0.035)	(0.045)
Paid activities	-0.094**	-0.092**	-0.056	-0.060	0.266***
	(0.038)	(0.039)	(0.041)	(0.038)	(0.043)
Studying	0.004	0.005	0.012	0.058	0.198***
	(0.052)	(0.052)	(0.052)	(0.041)	(0.059)
Leisure	-0.033	-0.031	-0.029	0.126***	0.066
	(0.037)	(0.037)	(0.037)	(0.034)	(0.043)
Constant	0.009	0.009	0.017		-0.000*
	(0.032)	(0.032)	(0.032)		(0.000)
Observations	951	950	929		1,601
Adjusted R^2	0.037	0.036	0.055		0.386
Vietnam					
Sleep	-0.104**	-0.107**	-0.089**	-0.085*	-0.107**
	(0.045)	(0.045)	(0.044)	(0.050)	(0.045)
Caring for others	-0.124***	-0.119***	-0.123***	-0.067*	-0.219***
	(0.033)	(0.033)	(0.032)	(0.037)	(0.039)
Domestic chores	-0.058	-0.056	-0.034	-0.141***	0.136***
	(0.042)	(0.043)	(0.043)	(0.043)	(0.038)
Farm/business	-0.166***	-0.161***	-0.136**	-0.112**	0.102**
	(0.056)	(0.057)	(0.061)	(0.049)	(0.050)
Paid activities	-0.152***	-0.145***	-0.120**	-0.034	0.066
	(0.055)	(0.056)	(0.055)	(0.022)	(0.041)
Studying	-0.165*	-0.150	-0.110	-0.201***	-0.041
	(0.092)	(0.092)	(0.092)	(0.069)	(0.076)
Leisure	-0.108**	-0.106**	-0.085	-0.256***	-0.290***
	(0.052)	(0.052)	(0.053)	(0.071)	(0.062)
Constant	0.002	0.001	0.019		0.000
	(0.033)	(0.034)	(0.037)		(0.000)
Observations	813	808	804		1,577
Adjusted R^2	0.045	0.047	0.066		0.574

Notes: *** p<0.01, ** p<0.05, * p<0.1; robust standard errors in parentheses. Coefficients are standardized to have mean 0 and standard deviation 1. Controls include: gender of child, grandparent present at home, number of siblings, urban dummy, wealth index, height-for-age z-score, and parental education in years. Column names refer to estimation results from different models: CT - Contemporaneous; VA- Value-added; CUM.- Cumulative; FE- Fixed effects. Wave 3 and wave 2 values in FE and CUM, lagged test scores used in VA and CUM.

Table 10: noncognitive Production Model Results: Self-efficacy

	CT	VA	CUM Wave 3	CUM Wave 2	FE
Ethiopia					
Sleep	-0.037	-0.037	-0.033	-0.000	-0.250***
	(0.038)	(0.038)	(0.038)	(0.040)	(0.049)
Caring for others	0.015	0.014	0.036	-0.008	0.196***
	(0.044)	(0.044)	(0.044)	(0.037)	(0.047)
Domestic chores	-0.069	-0.069	-0.047	-0.032	0.333***
	(0.045)	(0.045)	(0.047)	(0.041)	(0.052)
Farm/business	-0.052	-0.052	-0.048	0.005	0.172***
	(0.054)	(0.054)	(0.056)	(0.055)	(0.059)
Paid activities	-0.069*	-0.069*	-0.026	-0.077**	0.239***
	(0.037)	(0.037)	(0.039)	(0.033)	(0.037)
Studying	0.055	0.056	0.040	0.096**	0.198***
	(0.052)	(0.052)	(0.054)	(0.045)	(0.055)
Leisure	-0.062	-0.063	-0.057	0.011	0.113**
	(0.045)	(0.045)	(0.044)	(0.042)	(0.045)
Constant	-0.007	-0.007	-0.001		0.000**
	(0.034)	(0.034)	(0.034)		(0.000)
Observations	819	819	817		1,782
Adjusted R^2	0.072	0.071	0.084		0.273
India					
Sleep	-0.098***	-0.099***	-0.102***	-0.026	-0.459***
	(0.033)	(0.034)	(0.033)	(0.031)	(0.036)
Caring for others	-0.094**	-0.094**	-0.107**	0.007	-0.017
	(0.043)	(0.043)	(0.044)	(0.052)	(0.032)
Domestic chores	-0.069*	-0.070*	-0.055	-0.082**	0.332***
	(0.036)	(0.036)	(0.037)	(0.035)	(0.041)
Farm/business	-0.139***	-0.141***	-0.060	-0.132***	0.166***
	(0.043)	(0.043)	(0.043)	(0.037)	(0.038)
Paid activities	-0.078**	-0.078**	-0.045	-0.042	0.261***
	(0.038)	(0.038)	(0.041)	(0.041)	(0.038)
Studying	0.046	0.046	0.043	-0.035	0.241***
	(0.047)	(0.047)	(0.048)	(0.038)	(0.063)
Leisure	-0.124***	-0.125***	-0.135***	0.002	0.084**
	(0.042)	(0.042)	(0.041)	(0.033)	(0.039)
Constant	-0.000	-0.000	0.004		-0.000***
	(0.030)	(0.030)	(0.030)		(0.000)
Observations	951	951	930		1,600
Adjusted R^2	0.133	0.132	0.139		0.405
Vietnam					
Sleep	-0.174***	-0.175***	-0.165***	-0.021	-0.150***
	(0.041)	(0.041)	(0.042)	(0.045)	(0.048)
Caring for others	-0.030	-0.029	-0.024	-0.057	-0.189***
	(0.040)	(0.040)	(0.042)	(0.040)	(0.043)
Domestic chores	-0.139***	-0.142***	-0.129***	-0.033	0.075*
	(0.038)	(0.039)	(0.039)	(0.045)	(0.044)
Farm/business	-0.174***	-0.178***	-0.164***	-0.063	0.064
	(0.048)	(0.048)	(0.051)	(0.053)	(0.051)
Paid activities	-0.228***	-0.233***	-0.215***	-0.043	0.027
	(0.046)	(0.046)	(0.046)	(0.028)	(0.044)
Studying	-0.043	-0.050	-0.036	-0.079	-0.078
	(0.073)	(0.073)	(0.076)	(0.064)	(0.082)
Leisure	-0.211***	-0.212***	-0.205***	-0.172***	-0.326***
	(0.048)	(0.048)	(0.049)	(0.063)	(0.065)
Constant	-0.023	-0.023	-0.023		-0.069**
	(0.032)	(0.032)	(0.032)		(0.028)
Observations	813	812	808		1,573
Adjusted R^2	0.144	0.145	0.147		0.553

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; robust standard errors in parentheses. Coefficients are standardized to have mean 0 and standard deviation 1. Controls include: gender of child, grandparent present at home, number of siblings, urban dummy, wealth index, height-for-age z-score, and parental education in years. Column names refer to estimation results from different models: CT - Contemporaneous; VA- Value-added; CUM.- Cumulative; FE- Fixed effects. Wave 3 and wave 2 values in FE and CUM, lagged test scores used in VA and CUM.

Table 11: noncognitive Production Model Results: Aspiration

	CT	VA	CUM Wave 3	CUM Wave 2	FE
Ethiopia					
Sleep	-0.176***	-0.175***	-0.157***	-0.050	-0.095**
	(0.038)	(0.038)	(0.039)	(0.041)	(0.038)
Caring for others	0.028	0.029	0.074*	-0.113***	0.036
	(0.042)	(0.042)	(0.043)	(0.040)	(0.043)
Domestic chores	-0.183***	-0.183***	-0.157***	-0.089*	-0.062
	(0.049)	(0.050)	(0.050)	(0.050)	(0.051)
Farm/business	-0.207***	-0.205***	-0.173**	-0.102	-0.019
	(0.073)	(0.073)	(0.069)	(0.068)	(0.057)
Paid activities	-0.224***	-0.224***	-0.188***	-0.096*	-0.092
	(0.075)	(0.075)	(0.072)	(0.057)	(0.061)
Studying	0.040	0.036	0.035	0.007	0.055
	(0.031)	(0.031)	(0.032)	(0.040)	(0.037)
Leisure	-0.132***	-0.130***	-0.123***	-0.082**	-0.026
	(0.042)	(0.042)	(0.042)	(0.041)	(0.048)
Constant	-0.025	-0.025	-0.020		-0.002
	(0.035)	(0.035)	(0.035)		(0.002)
Observations	811	811	809		1,747
Adjusted R^2	0.148	0.150	0.161		0.021
India					
Sleep	-0.096***	-0.094***	-0.079**	-0.003	-0.178***
	(0.035)	(0.035)	(0.035)	(0.026)	(0.029)
Caring for others	-0.035	-0.034	-0.023	0.003	0.024
	(0.027)	(0.027)	(0.027)	(0.027)	(0.034)
Domestic chores	-0.151***	-0.149***	-0.155***	0.007	0.040
	(0.044)	(0.044)	(0.045)	(0.031)	(0.048)
Farm/business	-0.270***	-0.266***	-0.190***	-0.162***	-0.032
	(0.044)	(0.044)	(0.045)	(0.051)	(0.050)
Paid activities	-0.422***	-0.422***	-0.347***	-0.107*	-0.148*
	(0.054)	(0.054)	(0.058)	(0.056)	(0.080)
Studying	-0.067	-0.067	-0.076*	0.039	0.102**
	(0.041)	(0.041)	(0.042)	(0.028)	(0.040)
Leisure	-0.179***	-0.178***	-0.168***	0.029	-0.009
	(0.036)	(0.036)	(0.037)	(0.030)	(0.036)
Constant	-0.013	-0.013	-0.011		-0.034***
	(0.028)	(0.028)	(0.028)		(0.007)
Observations	936	936	917		1,512
Adjusted R^2	0.327	0.327	0.346		0.112
Vietnam					
Sleep	-0.117***	-0.116***	-0.082**	-0.194***	-0.155***
	(0.038)	(0.038)	(0.036)	(0.054)	(0.040)
Caring for others	-0.074*	-0.076*	-0.079*	-0.107**	-0.161***
	(0.042)	(0.043)	(0.044)	(0.045)	(0.041)
Domestic chores	-0.100*	-0.098*	-0.083	-0.113***	-0.065
	(0.052)	(0.051)	(0.053)	(0.042)	(0.051)
Farm/business	-0.332***	-0.329***	-0.282***	-0.121*	-0.231***
	(0.052)	(0.052)	(0.049)	(0.070)	(0.055)
Paid activities	-0.310***	-0.307***	-0.275***	-0.090	-0.153***
	(0.060)	(0.059)	(0.054)	(0.062)	(0.044)
Studying	-0.112*	-0.109*	-0.080	-0.131*	-0.135**
	(0.058)	(0.058)	(0.056)	(0.071)	(0.064)
Leisure	-0.351***	-0.352***	-0.315***	-0.240***	-0.389***
	(0.050)	(0.050)	(0.046)	(0.083)	(0.053)
Constant	-0.020	-0.019	-0.018		-0.032**
	(0.029)	(0.029)	(0.028)		(0.016)
Observations	803	803	800		1,546
Adjusted R^2	0.390	0.390	0.424		0.304

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; robust standard errors in parentheses. Coefficients are standardized to have mean 0 and standard deviation 1. Controls include: gender of child, grandparent present at home, number of siblings, urban dummy, wealth index, height-for-age z-score, and parental education in years. Column names refer to estimation results from different models: CT - Contemporaneous; VA- Value-added; CUM.- Cumulative; FE- Fixed effects. Wave 3 and wave 2 values in FE and CUM, lagged test scores used in VA and CUM.

Table 12: Estimation of Cognitive Production Function - Older Cohort Sample

	PPVT (1)	PPVT (2)	MATH (1)	MATH (2)
Ethiopia				
Hours of work	-0.138***	-0.041	-0.123***	0.090*
	(0.039)	(0.045)	(0.042)	(0.046)
Hours of study		0.234***		0.518***
		(0.053)		(0.055)
Constant	-0.007	-0.006	-0.000	0.003
	(0.028)	(0.028)	(0.030)	(0.028)
Number of observations	953	952	962	961
Adjusted R^2	0.264	0.277	0.151	0.224
India				
Hours of work	-0.312***	-0.019	-0.343***	-0.012
	(0.031)	(0.057)	(0.029)	(0.052)
Hours of study		0.348***		0.397***
		(0.058)		(0.052)
Constant	0.042	0.043	0.001	0.000
	(0.029)	(0.028)	(0.026)	(0.026)
Number of observations	853	853	960	960
Adjusted R^2	0.306	0.334	0.328	0.365
Vietnam				
Hours of work	-0.005	0.029	0.007	0.055
	(0.046)	(0.047)	(0.045)	(0.046)
Hours of study		0.119*		0.265***
		(0.065)		(0.063)
Constant	-0.012	-0.004	0.017	0.025
	(0.028)	(0.028)	(0.027)	(0.027)
Number of observations	838	829	856	847
Adjusted R^2	0.336	0.331	0.362	0.368

Notes: *** p<0.01, ** p<0.05, * p<0.1; robust standard errors in parentheses. Coefficients are standardized to have mean 0 and standard deviation 1. Controls include: gender of child, grandparent present at home, number of siblings, dummy for school enrollment, urban dummy, wealth index, height-for-age z-score, and parental education in years.

Appendix

Table A1: Cognitive Skills (PPVT) - Ethiopia, Older Cohorts

	Cont.	V.A	Cum. Time t	Cum. Time $t-1$	F.E
Sleep	-0.032	0.001	0.003	0.022	-0.201***
	(0.036)	(0.034)	(0.036)	(0.035)	(0.040)
Caring for others	-0.080**	-0.024	0.000	-0.061*	0.137***
	(0.040)	(0.037)	(0.038)	(0.033)	(0.041)
Domestic chores	-0.012	0.030	0.060	-0.079**	0.269***
	(0.039)	(0.038)	(0.041)	(0.035)	(0.045)
Tasks on family farm (business)	-0.150***	-0.104**	-0.060	-0.132***	0.133**
	(0.044)	(0.043)	(0.045)	(0.050)	(0.054)
Paid activities	-0.125***	-0.069*	-0.048	-0.057	0.127***
	(0.043)	(0.039)	(0.038)	(0.046)	(0.033)
Studying (extra tuition)	0.080**	0.054	0.076**	-0.050	0.204***
	(0.038)	(0.036)	(0.037)	(0.032)	(0.044)
Leisure	-0.068*	-0.027	-0.026	-0.081**	0.115***
	(0.038)	(0.037)	(0.037)	(0.036)	(0.038)
Grandparent present at home	-0.036	-0.051	-0.086*	0.030	-0.075
	(0.031)	(0.032)	(0.046)	(0.046)	(0.065)
Number of siblings at home	-0.080**	-0.096***	-0.089*	-0.022	-0.043
	(0.035)	(0.035)	(0.049)	(0.046)	(0.065)
Resides in urban area	0.220***	0.199***	-0.040	0.243**	-0.194
	(0.045)	(0.044)	(0.095)	(0.096)	(0.137)
Wealth index of the household	0.147***	0.125***	0.097*	0.034	0.749***
	(0.042)	(0.041)	(0.050)	(0.054)	(0.066)
Height-for-age z-score	0.089***	0.060**	0.076*	-0.013	-0.040
	(0.031)	(0.030)	(0.042)	(0.040)	(0.065)
Child is female	-0.141***	-0.133***	-0.153***		
	(0.033)	(0.032)	(0.033)		
Father's education in years	0.081**	0.073**	0.080**		
	(0.038)	(0.037)	(0.037)		
Mother's education in years	0.019	-0.011	-0.026		
	(0.035)	(0.033)	(0.035)		
Lagged test score		0.231***	0.210***		
		(0.033)	(0.034)		
Constant	-0.050	-0.012	-0.017		0.000
	(0.030)	(0.029)	(0.029)		(0.000)
Observations	812	786	784		1,782
Adjusted R^2	0.307	0.332	0.346		0.260

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A2: Cognitive Skills (PPVT) - India, Older Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.198***	-0.132***	-0.133***	-0.057**	-0.232***
	(0.033)	(0.032)	(0.032)	(0.028)	(0.029)
Caring for others	-0.057*	-0.052	-0.044	-0.007	-0.014
	(0.029)	(0.032)	(0.033)	(0.024)	(0.029)
Domestic chores	-0.046	0.002	0.003	-0.066**	0.147***
	(0.033)	(0.031)	(0.033)	(0.029)	(0.031)
Tasks on family farm (business)	-0.177***	-0.113***	-0.096***	-0.043	0.041
	(0.032)	(0.032)	(0.036)	(0.029)	(0.035)
Paid activities	-0.185***	-0.096***	-0.063*	-0.097***	0.127***
	(0.036)	(0.033)	(0.037)	(0.034)	(0.033)
Studying (extra tuition)	0.016	0.005	0.002	-0.066*	0.195***
	(0.048)	(0.044)	(0.047)	(0.037)	(0.043)
Leisure	-0.098***	-0.086**	-0.081**	-0.061**	0.072**
	(0.036)	(0.035)	(0.034)	(0.030)	(0.032)
Grandparent present at home	0.011	0.005	0.037	-0.034	-0.031
	(0.029)	(0.026)	(0.040)	(0.039)	(0.051)
Number of siblings at home	-0.037	-0.029	-0.021	-0.013	-0.053
	(0.030)	(0.026)	(0.037)	(0.037)	(0.061)
Resides in urban area	-0.032*	-0.025***	-0.025***	0.007	0.004
	(0.019)	(0.009)	(0.009)	(0.032)	(0.018)
Wealth index of the household	0.174***	0.148***	0.118**	-0.003	0.432***
	(0.032)	(0.030)	(0.047)	(0.048)	(0.056)
Height-for-age z-score	0.094***	0.071***	0.066**	0.023	-0.007
	(0.030)	(0.026)	(0.030)	(0.032)	(0.023)
Child is female	-0.181***	-0.178***	-0.171***		
	(0.032)	(0.030)	(0.032)		
Father's education in years	0.040	0.020	0.013		
	(0.036)	(0.034)	(0.035)		
Mother's education in years	0.121***	0.096***	0.099***		
	(0.038)	(0.034)	(0.035)		
Lagged test score		0.362***	0.354***		
		(0.030)	(0.032)		
Constant	0.051*	0.045*	0.047		-0.000
	(0.027)	(0.025)	(0.025)		(0.000)
Observations	846	834	817		1,602
Adjusted R2	0.354	0.444	0.450		0.244

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A3: Cognitive Skills (PPVT) - Vietnam, Older Cohorts

| | Cont. | V.A | Cum. | | F.E |
			Time t	Time $t-1$	
Sleep	-0.053	-0.023	-0.020	-0.070*	-0.053*
	(0.037)	(0.036)	(0.035)	(0.041)	(0.031)
Caring for others	-0.001	-0.001	-0.004	-0.060**	-0.050*
	(0.030)	(0.028)	(0.028)	(0.029)	(0.030)
Domestic chores	0.049	0.057*	0.066*	-0.056	0.017
	(0.037)	(0.034)	(0.035)	(0.036)	(0.030)
Tasks on family farm (business)	-0.183***	-0.142***	-0.094*	-0.149***	0.096**
	(0.055)	(0.055)	(0.057)	(0.048)	(0.046)
Paid activities	-0.099*	-0.075	-0.056	0.084*	-0.025
	(0.053)	(0.051)	(0.050)	(0.045)	(0.034)
Studying (extra tuition)	-0.033	-0.025	0.004	-0.158***	0.031
	(0.064)	(0.061)	(0.061)	(0.059)	(0.048)
Leisure	-0.098**	-0.065	-0.047	-0.179***	-0.010
	(0.047)	(0.046)	(0.045)	(0.059)	(0.036)
Grandparent present at home	0.007	0.006	-0.030	0.035	-0.048
	(0.030)	(0.029)	(0.040)	(0.038)	(0.033)
Number of siblings at home	-0.015	0.010	0.061	-0.065	0.053
	(0.035)	(0.035)	(0.051)	(0.048)	(0.053)
Resides in urban area	0.006	0.004	-0.015	0.028***	-0.017***
	(0.029)	(0.028)	(0.029)	(0.004)	(0.003)
Wealth index of the household	0.293***	0.256***	0.245***	0.017	0.410***
	(0.047)	(0.045)	(0.058)	(0.061)	(0.051)
Height-for-age z-score	0.167***	0.134***	0.070	0.080*	-0.045
	(0.031)	(0.032)	(0.048)	(0.045)	(0.059)
Child is female	-0.039	-0.040	-0.051*		
	(0.030)	(0.029)	(0.030)		
Father's education in years	0.041	0.018	0.030		
	(0.043)	(0.041)	(0.040)		
Mother's education in years	0.114***	0.082**	0.071*		
	(0.042)	(0.041)	(0.041)		
Lagged test score		0.247***	0.224***		
		(0.044)	(0.042)		
Constant	-0.012	-0.008	-0.006		-0.000***
	(0.029)	(0.028)	(0.028)		(0.000)
Observations	796	792	790		1,578
Adjusted R2	0.353	0.396	0.413		0.125

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

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Table A4: Cognitive Skills (MATH) - Ethiopia, Older Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.096***	-0.098***	-0.074**	-0.072**	-0.006
	(0.035)	(0.035)	(0.036)	(0.036)	(0.031)
Caring for others	-0.073**	-0.053*	-0.031	-0.082**	-0.005
	(0.031)	(0.031)	(0.032)	(0.033)	(0.029)
Domestic chores	-0.082**	-0.050	-0.025	-0.086***	-0.055*
	(0.037)	(0.038)	(0.039)	(0.033)	(0.032)
Tasks on family farm (business)	-0.058	-0.017	0.004	-0.096*	0.025
	(0.044)	(0.043)	(0.045)	(0.049)	(0.040)
Paid activities	-0.060*	-0.042	-0.013	-0.042*	-0.055**
	(0.032)	(0.031)	(0.031)	(0.024)	(0.023)
Studying (extra tuition)	0.212***	0.223***	0.210***	0.058	0.055
	(0.053)	(0.052)	(0.051)	(0.043)	(0.036)
Leisure	-0.113***	-0.089**	-0.083**	-0.060	-0.062**
	(0.037)	(0.036)	(0.034)	(0.037)	(0.028)
Grandparent present at home	-0.030	-0.023	-0.011	-0.005	-0.009
	(0.032)	(0.031)	(0.057)	(0.056)	(0.049)
Number of siblings at home	-0.058*	-0.063*	-0.076	0.014	-0.078*
	(0.033)	(0.033)	(0.049)	(0.046)	(0.046)
Resides in urban area	0.134***	0.058	0.048	-0.046	0.035
	(0.043)	(0.043)	(0.085)	(0.086)	(0.079)
Wealth index of the household	0.047	0.025	-0.046	0.143**	-0.130**
	(0.044)	(0.044)	(0.060)	(0.064)	(0.052)
height-for-age z-score	0.072**	0.033	0.024	-0.007	-0.106**
	(0.032)	(0.032)	(0.049)	(0.050)	(0.049)
Child is female	-0.125***	-0.106***	-0.100**		
	(0.041)	(0.040)	(0.041)		
Father's education in years	0.010	-0.007	-0.013		
	(0.044)	(0.043)	(0.043)		
Mother's education in years	0.098**	0.074*	0.065		
	(0.044)	(0.043)	(0.044)		
Lagged test score		0.254***	0.217***		
		(0.036)	(0.035)		
Constant	-0.001	0.008	0.009		0.000***
	(0.028)	(0.028)	(0.028)		(0.000)
Observations	965	939	936		1,782
Adjusted R2	0.221	0.270	0.290		0.035

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

	Cont.	V.A	Cum. Time t	Cum. Time $t-1$	F.E
Sleep	-0.179***	-0.132***	-0.121***	-0.063**	-0.181***
	(0.031)	(0.031)	(0.031)	(0.025)	(0.030)
Caring for others	-0.064***	-0.052**	-0.046**	0.008	-0.043*
	(0.020)	(0.020)	(0.021)	(0.019)	(0.025)
Domestic chores	-0.091***	-0.076***	-0.096***	0.001	0.026
	(0.027)	(0.026)	(0.027)	(0.026)	(0.030)
Tasks on family farm (business)	-0.144***	-0.118***	-0.101***	-0.024	-0.044*
	(0.021)	(0.020)	(0.023)	(0.018)	(0.025)
Paid activities	-0.194***	-0.154***	-0.123***	-0.047**	-0.043
	(0.030)	(0.030)	(0.034)	(0.021)	(0.031)
Studying (extra tuition)	0.055	0.038	0.014	0.033	0.146***
	(0.048)	(0.047)	(0.048)	(0.032)	(0.046)
Leisure	-0.106***	-0.095***	-0.089***	-0.050*	0.013
	(0.029)	(0.030)	(0.030)	(0.028)	(0.030)
Grandparent present at home	0.003	0.007	0.039	-0.050	0.008
	(0.025)	(0.025)	(0.038)	(0.038)	(0.051)
Number of siblings at home	-0.092***	-0.083***	-0.061	-0.011	-0.090*
	(0.028)	(0.027)	(0.041)	(0.042)	(0.049)
Resides in urban area	-0.027	-0.010	-0.006	-0.103***	-0.011
	(0.019)	(0.018)	(0.022)	(0.036)	(0.020)
Wealth index of the household	0.148***	0.134***	0.105**	0.082*	0.198***
	(0.029)	(0.028)	(0.042)	(0.047)	(0.052)
height-for-age z-score	0.077***	0.057**	0.060**	-0.002	-0.008
	(0.027)	(0.026)	(0.028)	(0.025)	(0.026)
Child is female	-0.140***	-0.140***	-0.145***		
	(0.029)	(0.028)	(0.030)		
Father's education in years	0.030	0.023	0.022		
	(0.035)	(0.034)	(0.035)		
Mother's education in years	0.127***	0.101***	0.108***		
	(0.038)	(0.036)	(0.037)		
Lagged test score		0.243***	0.241***		
		(0.028)	(0.030)		
Constant	0.001	0.003	0.003		-0.000**
	(0.025)	(0.025)	(0.025)		(0.000)
Observations	960	941	920		1,602
Adjusted R2	0.377	0.430	0.437		0.096

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A6: Cognitive Skills (MATH) - Vietnam, Older Cohorts

	Cont.	V.A	Cum. Time t	Cum. Time $t-1$	F.E
Sleep	-0.089**	-0.105***	-0.089**	-0.091**	-0.122***
	(0.036)	(0.036)	(0.037)	(0.038)	(0.038)
Caring for others	-0.072**	-0.064**	-0.070**	-0.039	-0.185***
	(0.030)	(0.029)	(0.029)	(0.030)	(0.033)
Domestic chores	-0.071**	-0.081***	-0.057*	-0.128***	0.049
	(0.030)	(0.029)	(0.029)	(0.036)	(0.037)
Tasks on family farm (business)	-0.185***	-0.160***	-0.115**	-0.151***	-0.064
	(0.042)	(0.044)	(0.047)	(0.045)	(0.044)
Paid activities	-0.217***	-0.227***	-0.198***	-0.039**	-0.092**
	(0.044)	(0.042)	(0.042)	(0.018)	(0.040)
Studying (extra tuition)	-0.075	-0.077	-0.033	-0.220***	-0.046
	(0.067)	(0.068)	(0.068)	(0.059)	(0.068)
Leisure	-0.243***	-0.218***	-0.195***	-0.211***	-0.328***
	(0.044)	(0.043)	(0.044)	(0.058)	(0.052)
Grandparent present at home	0.022	0.026	-0.004	0.040	-0.060
	(0.028)	(0.028)	(0.047)	(0.045)	(0.066)
Number of siblings at home	-0.058*	-0.029	-0.021	-0.006	-0.104*
	(0.030)	(0.030)	(0.043)	(0.046)	(0.061)
Resides in urban area	0.050	0.056*	0.041	-0.019***	0.017***
	(0.033)	(0.032)	(0.034)	(0.004)	(0.003)
Wealth index of the household	0.114***	0.091**	0.122**	-0.029	1.111***
	(0.043)	(0.043)	(0.060)	(0.058)	(0.070)
height-for-age z-score	0.172***	0.126***	0.069	0.079*	-0.112**
	(0.029)	(0.029)	(0.042)	(0.040)	(0.057)
Child is female	0.083***	0.087***	0.094***	0.018	
	(0.029)	(0.029)	(0.030)		
Father's education in years	0.087**	0.043	0.040		
	(0.041)	(0.041)	(0.041)		
Mother's education in years	0.102**	0.056	0.063		
	(0.041)	(0.040)	(0.039)		
Lagged test score		0.218***	0.198***		
		(0.033)	(0.033)		
Constant	0.012	0.015	0.020		0.000
	(0.027)	(0.027)	(0.027)		(0.000)
Observations	851	813	809		1,578
Adjusted R2	0.354	0.394	0.407		0.454

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A7: Cognitive Skills (PPVT) - Ethiopia, Younger Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.048**	-0.044**	0.013	0.003	-0.194***
	(0.021)	(0.021)	(0.029)	(0.032)	(0.035)
Caring for others	-0.096***	-0.090***	-0.058*	-0.058*	-0.027
	(0.020)	(0.020)	(0.032)	(0.030)	(0.026)
Domestic chores	-0.060***	-0.055***	-0.102***	-0.047	0.169***
	(0.021)	(0.021)	(0.030)	(0.031)	(0.035)
Tasks on family farm (business)	-0.139***	-0.134***	-0.148***	-0.072**	-0.046
	(0.026)	(0.026)	(0.035)	(0.035)	(0.034)
Paid activities	-0.018	-0.009	-0.021***	-0.032***	-0.032*
	(0.013)	(0.013)	(0.006)	(0.006)	(0.017)
Studying (extra tuition)	0.076***	0.088***	0.065*	0.081	0.259***
	(0.029)	(0.029)	(0.036)	(0.055)	(0.043)
Leisure	-0.169***	-0.152***	-0.167***	-0.130**	-0.163***
	(0.024)	(0.024)	(0.036)	(0.058)	(0.050)
Grandparent present at home	-0.004	-0.000	0.050	-0.067	0.239***
	(0.022)	(0.022)	(0.049)	(0.052)	(0.073)
Number of siblings at home	-0.023	-0.025	-0.178**	0.131*	0.486***
	(0.020)	(0.020)	(0.076)	(0.075)	(0.109)
Resides in urban area	0.191***	0.162***	-0.004	0.132	-0.116
	(0.030)	(0.030)	(0.088)	(0.090)	(0.092)
Wealth index of the household	0.103***	0.092***	0.047	0.013	0.296***
	(0.031)	(0.031)	(0.053)	(0.055)	(0.073)
Height-for-age z-score	0.051**	0.040*	-0.001	0.026	0.174***
	(0.022)	(0.021)	(0.044)	(0.040)	(0.051)
Child is female	-0.011	-0.010	-0.002		
	(0.022)	(0.022)	(0.030)		
Father's education in years	0.095***	0.081***	0.086**		
	(0.029)	(0.029)	(0.040)		
Mother's education in years	0.120***	0.096***	0.021		
	(0.031)	(0.031)	(0.042)		
Lagged test score		0.167***	0.118***		
		(0.021)	(0.029)		
Constant	-0.020	-0.018	0.092***		0.000*
	(0.019)	(0.019)	(0.026)		(0.000)
Observations	1,640	1,626	864		1,886
Adjusted R2	0.376	0.398	0.413		0.497

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A8: Cognitive Skills (PPVT) - India, Younger Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.092***	-0.089***	-0.053**	-0.075***	-0.149***
	(0.027)	(0.027)	(0.027)	(0.025)	(0.026)
Caring for others	-0.026	-0.035*	-0.011	-0.020	0.025
	(0.019)	(0.019)	(0.019)	(0.017)	(0.019)
Domestic chores	-0.053**	-0.055**	-0.019	-0.011	0.161***
	(0.022)	(0.022)	(0.023)	(0.022)	(0.023)
Tasks on family farm (business)	-0.028***	-0.025***	-0.024***	-0.014***	-0.015
	(0.009)	(0.007)	(0.006)	(0.003)	(0.011)
Paid activities	-0.037	-0.033	-0.030	0.047***	-0.014
	(0.044)	(0.040)	(0.041)	(0.002)	(0.027)
Studying (extra tuition)	0.051	0.053*	0.067**	-0.000	0.313***
	(0.032)	(0.032)	(0.032)	(0.027)	(0.032)
Leisure	-0.032	-0.016	0.042	-0.087***	0.163***
	(0.030)	(0.030)	(0.030)	(0.026)	(0.027)
Grandparent present at home	-0.011	-0.012	-0.009	-0.001	0.151**
	(0.022)	(0.021)	(0.064)	(0.062)	(0.071)
Number of siblings at home	-0.071***	-0.065***	-0.123**	0.080	0.349***
	(0.022)	(0.021)	(0.048)	(0.051)	(0.077)
Resides in urban area	0.044	0.043	0.040	-0.004	0.048**
	(0.036)	(0.036)	(0.040)	(0.031)	(0.024)
Wealth index of the household	0.099***	0.096***	0.060	0.019	0.348***
	(0.027)	(0.027)	(0.038)	(0.041)	(0.047)
Height-for-age z-score	0.098***	0.083***	0.062*	0.027	0.156***
	(0.027)	(0.026)	(0.032)	(0.028)	(0.056)
Child is female	-0.091***	-0.087***	-0.092***		
	(0.021)	(0.021)	(0.022)		
Father's education in years	0.088***	0.062**	0.065**		
	(0.029)	(0.029)	(0.031)		
Mother's education in years	0.113***	0.082***	0.100***		
	(0.032)	(0.032)	(0.035)		
Lagged test score		0.173***	0.179***		
		(0.022)	(0.024)		
Constant	-0.001	-0.001	-0.002		0.000***
	(0.021)	(0.021)	(0.022)		(0.000)
Observations	1,870	1,860	1,671		3,126
Adjusted R2	0.145	0.171	0.198		0.293

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A9: Cognitive Skills (PPVT) - Vietnam, Younger Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.048*	-0.053**	-0.039	-0.021	-0.035
	(0.025)	(0.025)	(0.026)	(0.023)	(0.022)
Caring for others	0.011	0.014	0.025	-0.014	-0.000
	(0.023)	(0.022)	(0.026)	(0.021)	(0.022)
Domestic chores	0.024	0.027	0.033	-0.029	0.200***
	(0.024)	(0.024)	(0.025)	(0.018)	(0.022)
Tasks on family farm (business)	-0.041*	-0.036*	-0.023	0.022***	-0.001
	(0.022)	(0.021)	(0.026)	(0.006)	(0.018)
Paid activities	0.025***	0.029***	0.029***		0.024
	(0.008)	(0.011)	(0.010)		(0.022)
Studying (extra tuition)	0.181***	0.164***	0.135***	0.051**	0.419***
	(0.031)	(0.031)	(0.035)	(0.023)	(0.021)
Leisure	0.047	0.054*	0.076**	-0.083***	-0.068***
	(0.032)	(0.032)	(0.035)	(0.031)	(0.024)
Grandparent present at home	-0.005	-0.010	-0.046	0.048	0.086
	(0.021)	(0.021)	(0.072)	(0.069)	(0.079)
Number of siblings at home	-0.064***	-0.062***	-0.154***	0.091	0.351***
	(0.020)	(0.020)	(0.057)	(0.056)	(0.062)
Resides in urban area	0.057*	0.032	0.189	-0.197	0.201
	(0.029)	(0.030)	(0.162)	(0.164)	(0.181)
Wealth index of the household	0.106***	0.080***	-0.017	0.100**	0.565***
	(0.029)	(0.029)	(0.042)	(0.040)	(0.036)
Height-for-age z-score	0.075***	0.077***	0.082**	-0.002	0.140***
	(0.024)	(0.023)	(0.034)	(0.030)	(0.042)
Child is female	-0.019	-0.025	-0.025		
	(0.021)	(0.021)	(0.022)		
Father's education in years	0.091***	0.068**	0.058*		
	(0.031)	(0.031)	(0.034)		
Mother's education in years	0.248***	0.224***	0.215***		
	(0.031)	(0.031)	(0.034)		
Lagged test score		0.151***	0.168***		
		(0.023)	(0.025)		
Constant	0.009	-0.001	0.012		0.000***
	(0.021)	(0.021)	(0.021)		(0.000)
Observations	1,598	1,551	1,376		2,576
Adjusted R2	0.310	0.322	0.315		0.701

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A10: Cognitive Skills (MATH) - Ethiopia, Younger Cohorts

| | Cont. | V.A | Cum. | | F.E |
			Time t	Time $t-1$	
Sleep	-0.071***	-0.062***	-0.045	-0.101***	0.164***
	(0.021)	(0.021)	(0.030)	(0.033)	(0.035)
Caring for others	-0.087***	-0.080***	-0.043	-0.102***	0.104***
	(0.019)	(0.020)	(0.031)	(0.028)	(0.031)
Domestic chores	-0.114***	-0.111***	-0.111***	-0.114***	0.068*
	(0.020)	(0.020)	(0.032)	(0.029)	(0.039)
Tasks on family farm (business)	-0.125***	-0.121***	-0.134***	-0.062*	-0.005
	(0.022)	(0.022)	(0.030)	(0.034)	(0.040)
Paid activities	-0.008	-0.010	-0.033***	-0.008	0.023
	(0.012)	(0.014)	(0.007)	(0.024)	(0.015)
Studying (extra tuition)	0.109***	0.117***	0.104***	-0.002	0.245***
	(0.027)	(0.027)	(0.035)	(0.045)	(0.042)
Leisure	-0.193***	-0.178***	-0.195***	-0.152***	0.274***
	(0.021)	(0.021)	(0.031)	(0.055)	(0.050)
Grandparent present at home	-0.041**	-0.038**	0.031	-0.070*	-0.004
	(0.019)	(0.019)	(0.038)	(0.042)	(0.072)
Number of siblings at home	-0.045**	-0.041**	-0.080	0.046	-0.182**
	(0.020)	(0.021)	(0.068)	(0.068)	(0.093)
Resides in urban area	0.251***	0.238***	0.080	0.120	-0.009
	(0.027)	(0.028)	(0.093)	(0.093)	(0.108)
Wealth index of the household	0.131***	0.122***	0.022	0.104**	-0.012
	(0.028)	(0.029)	(0.046)	(0.048)	(0.064)
Height-for-age z-score	0.061***	0.062***	0.054	-0.011	-0.012
	(0.021)	(0.021)	(0.039)	(0.037)	(0.045)
Child is female	-0.004	0.003	0.003		
	(0.021)	(0.021)	(0.028)		
Father's education in years	0.098***	0.087***	0.100**		
	(0.028)	(0.028)	(0.040)		
Mother's education in years	0.082***	0.062**	-0.019		
	(0.029)	(0.029)	(0.040)		
Lagged test score		0.099***	0.069**		
		(0.024)	(0.029)		
Constant	-0.043**	-0.034*	0.008		0.000
	(0.018)	(0.018)	(0.024)		(0.000)
Observations	1,598	1,562	847		1,886
Adjusted R2	0.472	0.482	0.498		0.113

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.179***	-0.132***	-0.121***	-0.063**	-0.126***
	(0.031)	(0.031)	(0.031)	(0.025)	(0.025)
Caring for others	-0.064***	-0.052**	-0.046**	0.008	0.042*
	(0.020)	(0.020)	(0.021)	(0.019)	(0.025)
Domestic chores	-0.091***	-0.076***	-0.096***	0.001	0.072***
	(0.027)	(0.026)	(0.027)	(0.026)	(0.023)
Tasks on family farm (business)	-0.144***	-0.118***	-0.101***	-0.024	0.003
	(0.021)	(0.020)	(0.023)	(0.018)	(0.019)
Paid activities	-0.194***	-0.154***	-0.123***	-0.047**	-0.010
	(0.030)	(0.030)	(0.034)	(0.021)	(0.018)
Studying (extra tuition)	0.055	0.038	0.014	0.033	0.202***
	(0.048)	(0.047)	(0.048)	(0.032)	(0.029)
Leisure	-0.106***	-0.095***	-0.089***	-0.050*	0.199***
	(0.029)	(0.030)	(0.030)	(0.028)	(0.028)
Grandparent present at home	0.003	0.007	0.039	-0.050	0.037
	(0.025)	(0.025)	(0.038)	(0.038)	(0.058)
Number of siblings at home	-0.092***	-0.083***	-0.061	-0.011	0.073
	(0.028)	(0.027)	(0.041)	(0.042)	(0.069)
Resides in urban area	-0.027	-0.010	-0.006	-0.103***	0.006
	(0.019)	(0.018)	(0.022)	(0.036)	(0.017)
Wealth index of the household	0.148***	0.134***	0.105**	0.082*	0.147***
	(0.029)	(0.028)	(0.042)	(0.047)	(0.047)
Height-for-age z-score	0.077***	0.057**	0.060**	-0.002	0.113**
	(0.027)	(0.026)	(0.028)	(0.025)	(0.045)
Child is female	-0.140***	-0.140***	-0.145***		
	(0.029)	(0.028)	(0.030)		
Father's education in years	0.030	0.023	0.022		
	(0.035)	(0.034)	(0.035)		
Mother's education in years	0.127***	0.101***	0.108***		
	(0.038)	(0.036)	(0.037)		
Lagged test score		0.243***	0.241***		
		(0.028)	(0.030)		
Constant	0.002	0.003	0.002		-0.000***
	(0.025)	(0.025)	(0.025)		(0.000)
Observations	952	934	913		3,126
Adjusted R2	0.388	0.435	0.442		0.122

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A12: Cognitive Skills (MATH) - Vietnam, Younger Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.003	-0.010	-0.032	-0.002	-0.027
	(0.027)	(0.028)	(0.030)	(0.024)	(0.025)
Caring for others	0.016	0.003	-0.005	0.002	0.024
	(0.028)	(0.029)	(0.033)	(0.024)	(0.027)
Domestic chores	0.018	0.024	-0.001	-0.031	0.184***
	(0.028)	(0.029)	(0.031)	(0.020)	(0.026)
Tasks on family farm (business)	-0.035	-0.033	-0.061	-0.044***	0.006
	(0.029)	(0.030)	(0.037)	(0.006)	(0.021)
Paid activities	0.026*	0.007	0.003		0.025
	(0.015)	(0.025)	(0.022)		(0.033)
Studying (extra tuition)	0.071**	0.039	0.018	0.089***	0.394***
	(0.032)	(0.033)	(0.036)	(0.024)	(0.023)
Leisure	0.065*	0.066*	0.062	-0.047	0.033
	(0.037)	(0.038)	(0.042)	(0.036)	(0.028)
Grandparent present at home	-0.055**	-0.052**	-0.248***	0.214***	-0.105
	(0.022)	(0.023)	(0.057)	(0.058)	(0.079)
Number of siblings at home	-0.031	-0.029	-0.067	0.047	0.324***
	(0.025)	(0.026)	(0.067)	(0.065)	(0.074)
Resides in urban area	0.042	0.016	0.291**	-0.283**	0.372**
	(0.027)	(0.030)	(0.113)	(0.115)	(0.149)
Wealth index of the household	0.176***	0.184***	0.085*	0.109**	0.598***
	(0.033)	(0.036)	(0.050)	(0.044)	(0.041)
Height-for-age z-score	0.100***	0.097***	0.044	0.057*	0.088*
	(0.024)	(0.025)	(0.036)	(0.034)	(0.048)
Child is female	-0.005	0.002	-0.002		
	(0.021)	(0.023)	(0.023)		
Father's education in years	0.175***	0.165***	0.124***		
	(0.031)	(0.033)	(0.035)		
Mother's education in years	0.136***	0.119***	0.111***		
	(0.032)	(0.034)	(0.036)		
Lagged test score		0.107***	0.095***		
		(0.026)	(0.027)		
Constant	-0.013	-0.007	0.048**		0.000***
	(0.021)	(0.022)	(0.023)		(0.000)
Observations	1,671	1,488	1,333		2,576
Adjusted R2	0.249	0.271	0.278		0.595

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A13: Non-Cognitive Skills (Self-esteem) - Ethiopia, Older Cohorts

	Cont.	V.A	Cum. Time t	Cum. Time $t-1$	F.E
Sleep	0.139***	0.135***	0.116***	0.077*	-0.227***
	(0.041)	(0.041)	(0.043)	(0.042)	(0.046)
Caring for others	0.005	0.008	0.017	-0.003	0.173***
	(0.039)	(0.039)	(0.042)	(0.038)	(0.045)
Domestic chores	0.020	0.026	0.037	-0.058	0.352***
	(0.049)	(0.048)	(0.049)	(0.045)	(0.050)
Tasks on family farm (business)	0.034	0.034	0.014	0.061	0.118**
	(0.052)	(0.052)	(0.054)	(0.055)	(0.057)
Paid activities	-0.074**	-0.075**	-0.051	-0.051	0.180***
	(0.037)	(0.038)	(0.039)	(0.037)	(0.034)
Studying (extra tuition)	0.139***	0.135***	0.135***	0.042	0.200***
	(0.048)	(0.048)	(0.048)	(0.040)	(0.052)
Leisure	-0.077*	-0.076*	-0.087**	0.045	0.048
	(0.041)	(0.041)	(0.042)	(0.042)	(0.044)
Grandparent present at home	0.007	0.007	0.002	-0.001	-0.164**
	(0.033)	(0.033)	(0.052)	(0.051)	(0.079)
Number of siblings at home	0.000	0.000	0.075	-0.101*	0.050
	(0.037)	(0.037)	(0.056)	(0.056)	(0.074)
Resides in urban area	0.021	0.012	-0.094	0.116	-0.297*
	(0.047)	(0.047)	(0.097)	(0.099)	(0.156)
Wealth index of the household	0.165***	0.167***	0.161***	-0.006	0.925***
	(0.048)	(0.048)	(0.059)	(0.063)	(0.077)
Height-for-age z-score	-0.015	-0.019	0.008	-0.012	0.011
	(0.037)	(0.037)	(0.054)	(0.051)	(0.074)
Child is female	-0.016	-0.023	-0.012		
	(0.042)	(0.042)	(0.044)		
Father's education in years	0.079*	0.080*	0.076*		
	(0.044)	(0.044)	(0.044)		
Mother's education in years	0.043	0.042	0.040		
	(0.041)	(0.041)	(0.042)		
Lagged test score		-0.057*	-0.048		
		(0.035)	(0.035)		
Constant	-0.004	0.001	0.003		0.000***
	(0.034)	(0.034)	(0.034)		(0.000)
Observations	819	818	816		1,782
Adjusted R2	0.098	0.099	0.106		0.269

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A14: Non-Cognitive Skills (Self-esteem) - India, Older Cohorts

| | Cont. | V.A | Cum. | | F.E |
			Time t	Time $t-1$	
Sleep	0.036	0.038	0.052	0.035	-0.435***
	(0.039)	(0.039)	(0.039)	(0.032)	(0.035)
Caring for others	-0.035	-0.034	-0.053	-0.001	0.030
	(0.030)	(0.030)	(0.033)	(0.028)	(0.037)
Domestic chores	0.078**	0.078**	0.098***	0.016	0.334***
	(0.033)	(0.033)	(0.033)	(0.036)	(0.044)
Tasks on family farm (business)	-0.034	-0.032	0.021	-0.040	0.167***
	(0.042)	(0.042)	(0.045)	(0.035)	(0.045)
Paid activities	-0.094**	-0.092**	-0.056	-0.060	0.266***
	(0.038)	(0.039)	(0.041)	(0.038)	(0.043)
Studying (extra tuition)	0.004	0.005	0.012	0.058	0.198***
	(0.052)	(0.052)	(0.052)	(0.041)	(0.059)
Leisure	-0.033	-0.031	-0.029	0.126***	0.066
	(0.037)	(0.037)	(0.037)	(0.034)	(0.043)
Grandparent present at home	0.068**	0.068**	0.120**	-0.061	-0.122*
	(0.033)	(0.033)	(0.049)	(0.047)	(0.069)
Number of siblings at home	0.012	0.012	-0.053	0.079	-0.179**
	(0.032)	(0.032)	(0.052)	(0.052)	(0.088)
Resides in urban area	0.054	0.053	0.051	0.070	0.007
	(0.036)	(0.036)	(0.043)	(0.043)	(0.040)
Wealth index of the household	-0.070*	-0.070*	-0.111**	0.040	0.709***
	(0.038)	(0.038)	(0.054)	(0.058)	(0.071)
Height-for-age z-score	0.019	0.019	0.006	0.049	-0.063
	(0.034)	(0.034)	(0.037)	(0.045)	(0.044)
Child is female	0.104***	0.104***	0.122***		
	(0.034)	(0.034)	(0.035)		
Father's education in years	0.025	0.024	0.005		
	(0.045)	(0.045)	(0.045)		
Mother's education in years	0.097**	0.097**	0.081*		
	(0.045)	(0.045)	(0.045)		
Lagged test score		-0.013	-0.013		
		(0.033)	(0.032)		
Constant	0.009	0.009	0.017		-0.000*
	(0.032)	(0.032)	(0.032)		(0.000)
Observations	951	950	929		1,601
Adjusted R2	0.037	0.036	0.055		0.386

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A15: Non-Cognitive Skills (Self-esteem) - Vietnam, Older Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.104**	-0.107**	-0.089**	-0.085*	-0.107**
	(0.045)	(0.045)	(0.044)	(0.050)	(0.045)
Caring for others	-0.124***	-0.119***	-0.123***	-0.067*	-0.219***
	(0.033)	(0.033)	(0.032)	(0.037)	(0.039)
Domestic chores	-0.058	-0.056	-0.034	-0.141***	0.136***
	(0.042)	(0.043)	(0.043)	(0.043)	(0.038)
Tasks on family farm (business)	-0.166***	-0.161***	-0.136**	-0.112**	0.102**
	(0.056)	(0.057)	(0.061)	(0.049)	(0.050)
Paid activities	-0.152***	-0.145***	-0.120**	-0.034	0.066
	(0.055)	(0.056)	(0.055)	(0.022)	(0.041)
Studying (extra tuition)	-0.165*	-0.150	-0.110	-0.201***	-0.041
	(0.092)	(0.092)	(0.092)	(0.069)	(0.076)
Leisure	-0.108**	-0.106**	-0.085	-0.256***	-0.290***
	(0.052)	(0.052)	(0.053)	(0.071)	(0.062)
Grandparent present at home	0.039	0.040	0.037	-0.000	0.002
	(0.035)	(0.035)	(0.060)	(0.066)	(0.082)
Number of siblings at home	-0.026	-0.029	0.013	-0.042	-0.205***
	(0.036)	(0.036)	(0.053)	(0.053)	(0.067)
Resides in urban area	-0.026	-0.033	-0.115	0.602	-0.021***
	(0.042)	(0.042)	(0.080)	(0.563)	(0.004)
Wealth index of the household	0.095*	0.103**	0.243***	-0.194**	1.559***
	(0.051)	(0.051)	(0.092)	(0.087)	(0.069)
Height-for-age z-score	-0.006	-0.003	-0.058	0.067	-0.007
	(0.032)	(0.032)	(0.051)	(0.054)	(0.066)
Child is female	-0.008	-0.004	-0.003		
	(0.034)	(0.034)	(0.034)		
Father's education in years	-0.020	-0.016	0.003		
	(0.050)	(0.051)	(0.050)		
Mother's education in years	0.068	0.064	0.069		
	(0.050)	(0.051)	(0.051)		
Lagged test score		0.062*	0.067**		
		(0.033)	(0.034)		
Constant	0.002	0.001	0.019		0.000
	(0.033)	(0.034)	(0.037)		(0.000)
Observations	813	808	804		1,577
Adjusted R2	0.045	0.047	0.066		0.574

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A16: Non-Cognitive Skills (Self-efficacy) - Ethiopia, Older Cohorts

	Cont.	V.A	Cum. Time t	Cum. Time $t-1$	F.E
Sleep	-0.037	-0.037	-0.033	-0.000	-0.250***
	(0.038)	(0.038)	(0.038)	(0.040)	(0.049)
Caring for others	0.015	0.014	0.036	-0.008	0.196***
	(0.044)	(0.044)	(0.044)	(0.037)	(0.047)
Domestic chores	-0.069	-0.069	-0.047	-0.032	0.333***
	(0.045)	(0.045)	(0.047)	(0.041)	(0.052)
Tasks on family farm (business)	-0.052	-0.052	-0.048	0.005	0.172***
	(0.054)	(0.054)	(0.056)	(0.055)	(0.059)
Paid activities	-0.069*	-0.069*	-0.026	-0.077**	0.239***
	(0.037)	(0.037)	(0.039)	(0.033)	(0.037)
Studying (extra tuition)	0.055	0.056	0.040	0.096**	0.198***
	(0.052)	(0.052)	(0.054)	(0.045)	(0.055)
Leisure	-0.062	-0.063	-0.057	0.011	0.113**
	(0.045)	(0.045)	(0.044)	(0.042)	(0.045)
Grandparent present at home	-0.008	-0.008	0.036	-0.054	-0.102
	(0.033)	(0.033)	(0.050)	(0.050)	(0.084)
Number of siblings at home	-0.063	-0.063	-0.052	-0.041	0.009
	(0.040)	(0.040)	(0.055)	(0.055)	(0.078)
Resides in urban area	0.115**	0.115**	0.011	0.070	-0.206
	(0.046)	(0.046)	(0.069)	(0.072)	(0.148)
Wealth index of the household	0.075*	0.076*	0.012	0.128**	0.949***
	(0.046)	(0.046)	(0.058)	(0.060)	(0.077)
Height-for-age z-score	0.118***	0.117***	0.100*	0.002	0.018
	(0.037)	(0.037)	(0.052)	(0.048)	(0.076)
Child is female	-0.083**	-0.082*	-0.069		
	(0.042)	(0.042)	(0.044)		
Father's education in years	0.031	0.032	0.011		
	(0.045)	(0.045)	(0.045)		
Mother's education in years	-0.092**	-0.092**	-0.099**		
	(0.043)	(0.043)	(0.043)		
Lagged test score		0.014	0.037		
		(0.034)	(0.035)		
Constant	-0.007	-0.007	-0.001		0.000**
	(0.034)	(0.034)	(0.034)		(0.000)
Observations	819	819	817		1,782
Adjusted R2	0.072	0.071	0.084		0.273

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A17: Non-Cognitive Skills (Self-efficacy) - India, Older Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.098***	-0.099***	-0.102***	-0.026	-0.459***
	(0.033)	(0.034)	(0.033)	(0.031)	(0.036)
Caring for others	-0.094**	-0.094**	-0.107**	0.007	-0.017
	(0.043)	(0.043)	(0.044)	(0.052)	(0.032)
Domestic chores	-0.069*	-0.070*	-0.055	-0.082**	0.332***
	(0.036)	(0.036)	(0.037)	(0.035)	(0.041)
Tasks on family farm (business)	-0.139***	-0.141***	-0.060	-0.132***	0.166***
	(0.043)	(0.043)	(0.043)	(0.037)	(0.038)
Paid activities	-0.078**	-0.078**	-0.045	-0.042	0.261***
	(0.038)	(0.038)	(0.041)	(0.041)	(0.038)
Studying (extra tuition)	0.046	0.046	0.043	-0.035	0.241***
	(0.047)	(0.047)	(0.048)	(0.038)	(0.063)
Leisure	-0.124***	-0.125***	-0.135***	0.002	0.084**
	(0.042)	(0.042)	(0.041)	(0.033)	(0.039)
Grandparent present at home	0.013	0.013	0.056	-0.055	-0.108
	(0.030)	(0.030)	(0.043)	(0.042)	(0.072)
Number of siblings at home	-0.071**	-0.072**	-0.063	0.008	-0.168*
	(0.032)	(0.032)	(0.064)	(0.062)	(0.092)
Resides in urban area	-0.043	-0.044	-0.046	0.046	-0.002
	(0.037)	(0.037)	(0.039)	(0.041)	(0.038)
Wealth index of the household	0.007	0.009	-0.048	0.022	0.757***
	(0.036)	(0.037)	(0.055)	(0.058)	(0.068)
Height-for-age z-score	0.051	0.051	0.042	0.018	-0.035
	(0.032)	(0.032)	(0.032)	(0.028)	(0.041)
Child is female	-0.062*	-0.062*	-0.041		
	(0.034)	(0.034)	(0.034)		
Father's education in years	-0.000	0.000	-0.020		
	(0.040)	(0.040)	(0.040)		
Mother's education in years	0.063	0.063	0.071*		
	(0.041)	(0.041)	(0.043)		
Lagged test score		0.016	0.013		
		(0.032)	(0.032)		
Constant	-0.000	-0.000	0.004		-0.000***
	(0.030)	(0.030)	(0.030)		(0.000)
Observations	951	951	930		1,600
Adjusted R2	0.133	0.132	0.139		0.405

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A18: Non-Cognitive Skills (Self-efficacy) - Vietnam, Older Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.174***	-0.175***	-0.165***	-0.021	-0.150***
	(0.041)	(0.041)	(0.042)	(0.045)	(0.048)
Caring for others	-0.030	-0.029	-0.024	-0.057	-0.189***
	(0.040)	(0.040)	(0.042)	(0.040)	(0.043)
Domestic chores	-0.139***	-0.142***	-0.129***	-0.033	0.075*
	(0.038)	(0.039)	(0.039)	(0.045)	(0.044)
Tasks on family farm (business)	-0.174***	-0.178***	-0.164***	-0.063	0.064
	(0.048)	(0.048)	(0.051)	(0.053)	(0.051)
Paid activities	-0.228***	-0.233***	-0.215***	-0.043	0.027
	(0.046)	(0.046)	(0.046)	(0.028)	(0.044)
Studying (extra tuition)	-0.043	-0.050	-0.036	-0.079	-0.078
	(0.073)	(0.073)	(0.076)	(0.064)	(0.082)
Leisure	-0.211***	-0.212***	-0.205***	-0.172***	-0.326***
	(0.048)	(0.048)	(0.049)	(0.063)	(0.065)
Grandparent present at home	0.046	0.046	-0.059	0.123**	-0.060
	(0.032)	(0.032)	(0.054)	(0.056)	(0.084)
Number of siblings at home	0.047	0.050	0.045	0.017	-0.230***
	(0.039)	(0.039)	(0.056)	(0.054)	(0.070)
Resides in urban area	-0.026	-0.023	-0.033	-0.011**	-2.348**
	(0.037)	(0.037)	(0.039)	(0.005)	(1.116)
Wealth index of the household	0.044	0.039	0.083	-0.076	1.576***
	(0.045)	(0.045)	(0.074)	(0.077)	(0.069)
Height-for-age z-score	0.008	0.004	-0.008	0.022	-0.022
	(0.034)	(0.034)	(0.047)	(0.050)	(0.068)
Child is female	-0.025	-0.026	-0.035		
	(0.034)	(0.034)	(0.035)		
Father's education in years	0.010	0.009	0.019		
	(0.050)	(0.051)	(0.051)		
Mother's education in years	0.022	0.020	0.020		
	(0.048)	(0.048)	(0.049)		
Lagged test score		-0.037	-0.038		
		(0.034)	(0.035)		
Constant	-0.023	-0.023	-0.023		-0.069**
	(0.032)	(0.032)	(0.032)		(0.028)
Observations	813	812	808		1,573
Adjusted R2	0.144	0.145	0.147		0.553

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A19: Non-Cognitive Skills (Aspiration) - Ethiopia, Older Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.176***	-0.175***	-0.157***	-0.050	-0.095**
	(0.038)	(0.038)	(0.039)	(0.041)	(0.038)
Caring for others	0.028	0.029	0.074*	-0.113***	0.036
	(0.042)	(0.042)	(0.043)	(0.040)	(0.043)
Domestic chores	-0.183***	-0.183***	-0.157***	-0.089*	-0.062
	(0.049)	(0.050)	(0.050)	(0.050)	(0.051)
Tasks on family farm (business)	-0.207***	-0.205***	-0.173**	-0.102	-0.019
	(0.073)	(0.073)	(0.069)	(0.068)	(0.057)
Paid activities	-0.224***	-0.224***	-0.188***	-0.096*	-0.092
	(0.075)	(0.075)	(0.072)	(0.057)	(0.061)
Studying (extra tuition)	0.040	0.036	0.035	0.007	0.055
	(0.031)	(0.031)	(0.032)	(0.040)	(0.037)
Leisure	-0.132***	-0.130***	-0.123***	-0.082**	-0.026
	(0.042)	(0.042)	(0.042)	(0.041)	(0.048)
Grandparent present at home	-0.026	-0.027	-0.064*	0.046	-0.000
	(0.036)	(0.035)	(0.038)	(0.038)	(0.041)
Number of siblings at home	-0.002	0.002	0.017	-0.028	-0.001
	(0.036)	(0.036)	(0.046)	(0.045)	(0.049)
Resides in urban area	0.090**	0.089**	-0.035	0.124*	-0.094
	(0.039)	(0.038)	(0.070)	(0.072)	(0.098)
Wealth index of the household	0.100**	0.098**	0.106*	-0.009	0.008
	(0.048)	(0.048)	(0.057)	(0.057)	(0.062)
Height-for-age z-score	-0.074*	-0.072*	-0.060	-0.026	-0.052
	(0.040)	(0.040)	(0.046)	(0.040)	(0.057)
Child is female	-0.032	-0.037	-0.036		
	(0.040)	(0.040)	(0.041)		
Father's education in years	-0.034	-0.039	-0.034		
	(0.043)	(0.044)	(0.045)		
Mother's education in years	-0.015	-0.015	-0.030		
	(0.040)	(0.040)	(0.040)		
Lagged test score		-0.056	-0.036		
		(0.041)	(0.037)		
Constant	-0.025	-0.025	-0.020		-0.002
	(0.035)	(0.035)	(0.035)		(0.002)
Observations	811	811	809		1,747
Adjusted R2	0.148	0.150	0.161		0.021

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

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Table A20: Non-Cognitive Skills (Aspiration) - India, Older Cohorts

| | Cont. | V.A | Cum. | | F.E |
			Time t	Time $t-1$	
Sleep	-0.096***	-0.094***	-0.079**	-0.003	-0.178***
	(0.035)	(0.035)	(0.035)	(0.026)	(0.029)
Caring for others	-0.035	-0.034	-0.023	0.003	0.024
	(0.027)	(0.027)	(0.027)	(0.027)	(0.034)
Domestic chores	-0.151***	-0.149***	-0.155***	0.007	0.040
	(0.044)	(0.044)	(0.045)	(0.031)	(0.048)
Tasks on family farm (business)	-0.270***	-0.266***	-0.190***	-0.162***	-0.032
	(0.044)	(0.044)	(0.045)	(0.051)	(0.050)
Paid activities	-0.422***	-0.422***	-0.347***	-0.107*	-0.148*
	(0.054)	(0.054)	(0.058)	(0.056)	(0.080)
Studying (extra tuition)	-0.067	-0.067	-0.076*	0.039	0.102**
	(0.041)	(0.041)	(0.042)	(0.028)	(0.040)
Leisure	-0.179***	-0.178***	-0.168***	0.029	-0.009
	(0.036)	(0.036)	(0.037)	(0.030)	(0.036)
Grandparent present at home	-0.053*	-0.053*	-0.020	-0.027	-0.083*
	(0.029)	(0.029)	(0.035)	(0.035)	(0.049)
Number of siblings at home	-0.023	-0.020	0.027	-0.054	0.014
	(0.028)	(0.028)	(0.050)	(0.055)	(0.079)
Resides in urban area	-0.014	-0.012	-0.012	-0.030	-0.031
	(0.063)	(0.059)	(0.060)	(0.034)	(0.062)
Wealth index of the household	0.026	0.021	0.045	-0.044	0.235***
	(0.031)	(0.031)	(0.046)	(0.052)	(0.057)
Height-for-age z-score	-0.023	-0.024	-0.027	0.008	-0.039
	(0.030)	(0.030)	(0.031)	(0.021)	(0.027)
Child is female	-0.045	-0.046	-0.044		
	(0.029)	(0.029)	(0.029)		
Father's education in years	0.021	0.020	0.035		
	(0.034)	(0.034)	(0.034)		
Mother's education in years	0.065*	0.064*	0.070**		
	(0.033)	(0.033)	(0.033)		
Lagged test score		-0.035	-0.034		
		(0.034)	(0.035)		
Constant	-0.013	-0.013	-0.011		-0.034***
	(0.028)	(0.028)	(0.028)		(0.007)
Observations	936	936	917		1,512
Adjusted R2	0.327	0.327	0.346		0.112

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.

Table A21: Non-Cognitive Skills (Aspiration) - Vietnam, Older Cohorts

	Cont.	V.A	Cum.		F.E
			Time t	Time $t-1$	
Sleep	-0.117***	-0.116***	-0.082**	-0.194***	-0.155***
	(0.038)	(0.038)	(0.036)	(0.054)	(0.040)
Caring for others	-0.074*	-0.076*	-0.079*	-0.107**	-0.161***
	(0.042)	(0.043)	(0.044)	(0.045)	(0.041)
Domestic chores	-0.100*	-0.098*	-0.083	-0.113***	-0.065
	(0.052)	(0.051)	(0.053)	(0.042)	(0.051)
Tasks on family farm (business)	-0.332***	-0.329***	-0.282***	-0.121*	-0.231***
	(0.052)	(0.052)	(0.049)	(0.070)	(0.055)
Paid activities	-0.310***	-0.307***	-0.275***	-0.090	-0.153***
	(0.060)	(0.059)	(0.054)	(0.062)	(0.044)
Studying (extra tuition)	-0.112*	-0.109*	-0.080	-0.131*	-0.135**
	(0.058)	(0.058)	(0.056)	(0.071)	(0.064)
Leisure	-0.351***	-0.352***	-0.315***	-0.240***	-0.389***
	(0.050)	(0.050)	(0.046)	(0.083)	(0.053)
Grandparent present at home	0.039*	0.040*	0.037	-0.011	0.030
	(0.023)	(0.023)	(0.032)	(0.031)	(0.043)
Number of siblings at home	-0.025	-0.026	0.098	-0.162**	0.144
	(0.036)	(0.036)	(0.067)	(0.067)	(0.088)
Resides in urban area	-0.016	-0.020	-0.037	-0.001	-0.289
	(0.027)	(0.027)	(0.027)	(0.005)	(0.643)
Wealth index of the household	0.113**	0.118**	0.173***	-0.124**	0.626***
	(0.052)	(0.052)	(0.065)	(0.059)	(0.061)
Height-for-age z-score	0.045*	0.047*	-0.001	0.054	-0.109*
	(0.027)	(0.027)	(0.039)	(0.045)	(0.061)
Child is female	0.039	0.039	0.029		
	(0.028)	(0.028)	(0.028)		
Father's education in years	0.054	0.058	0.065		
	(0.042)	(0.043)	(0.042)		
Mother's education in years	0.060	0.061	0.038		
	(0.044)	(0.044)	(0.043)		
Lagged test score		0.041	0.039		
		(0.032)	(0.029)		
Constant	-0.020	-0.019	-0.018		-0.032**
	(0.029)	(0.029)	(0.028)		(0.016)
Observations	803	803	800		1,546
Adjusted R2	0.390	0.390	0.424		0.304

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Column names refer to Cognitive Skills from different models: Cont. - Contemporaneous; V.A.- Value-added; Cum.- Cumulative; F.E.- Fixed-effects.