Child Labor, Educational Attainment and Talent Allocation

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Abstract

Child labor affects 160 million children aged 5 to 17, mostly in developing countries. Models end empirical work show that child labor is usually related to poverty and it impacts individual's human capital accumulation and health. In this research we propose a overlapping generations model where heterogeneous agents live for two periods and make decisions on child labor, educational attainment and educational investment and then calibrate it using Brazilian data from 2010. We show that parental education impacts whether children provide child labor or not. We also show that, depending on parental education, children with similar innate ability end up with different levels of educational attainment, human capital and wages. Finally, we analyze how different policies impact the overall economy and talent distribution.

Keywords: Child Labor, Talent Distribution
JEL Codes:

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1 Introduction

160 million children aged 5 to 17 engage in unpaid or exploitative labor worldwide, with 67 million performing dangerous or harmful work (ILO, 2021). Besides ethical reasons for being against child labor, it is believed that it harms individuals in various ways such as impairing human capital accumulation, having long lasting effects on health and increasing the chance that these individuals end up in the informal sector of the economy, not being able to access social protection policies.

There are several possible causes for child labor, but there is large evidence that it is closely tied to poverty (Basu and Van, 1998; Baland and Robinson, 2000; Ranjan, 2001; Edmonds and Schady, 2012; de Hoop and Rosati, 2014; de Hoop et al., 2019). Although it is likely that there are causal effects in both ways, with poverty causing child labor since parents are more likely to have their children working when they cannot themselves provide for the family, it is also true that child labor is a barrier to economic development, since children who engage in work from an early age seem to accumulate less human capital and are less productive when they are older, which in order makes industries adopt technologies which are less productive (Acemoglu, 2002).

Concerning theoretical research, Basu and Van (1998) develop a theoretical model where it is possible to have multiple equilibria, where some have child labor while others does not. Baland and Robinson (2000) and Ranjan (2001) show that in the presence of credit restrictions we can have a setting where child labor is inefficient, even when not considering the externalities of education.

The empirical literature shows that children who undergo child labor have worse educational outcomes (Emerson et al., 2017; Keane et al., 2022) and health (Kassouf, 2001; Lee and Orazem, 2010). Also, it seems there is a generational persistence in child labor (Emerson and Souza, 2003), while there also seems to exist an optimal age when to enter the labor market (Emerson and Souza, 2011).

Child labor happens not only as a substitute to schooling, but in a complementary way, i.e., children start working working while in school and, in consequence, have less time to

invest in human capital accumulation. Keane et al. (2022) show that usually child labor, even when done inside the household, crowds out school/study time.

Concerning government policies, there is a strand of the child labor literature showing that both conditional cash transfers (CCT) and unconditional cash transfers (UCT) to poor families seem to have a big impact on child labor (Edmonds and Schady, 2012; de Hoop and Rosati, 2014; de Hoop et al., 2019), showing that one of the main reason that parents choose to put their children to work is that they need to reach a minimum income for the household.

Finally, there is also research on how political decisions about child labor are done within each society, and how the decision to ban child labor happens (Doepke and Zilibotti, 2005).

In this paper, we will build a model based on Restuccia and Urrutia (2004) where the decision to send or not children to work is related to the family's labor income and wealth and child labor impacts educational attainment, human capital accumulation and wages. Also, as talent is equally distributed between households, we analyse how child labor impacts talent allocation in the economy.

In our model, each household has to choose how to allocate time between schooling and work for the children and also how much to spend in consumption and education. Also, each family has to decide if they are going to send their children to elementary school, high school and college. As the economy has a credit constrain, this will make children who are born in poor households, but have high innate ability to under-invest in education considering both time and capital.

To the best of our knowledge, this is the first paper identifying the effects of a child labor ban using a quantitative macroeconomic framework. Also, we try to explain how child labor impacts the allocation of talent in the economy. Finally, we analyze how different policies affecting government spending on basic and higher education impacts the overall economy and talent distribution.

We find that a banning child labor in the economy increases GDP, welfare and average human capital, also increasing attendance for all educational levels, but some children still

do not go to school. A compulsory schooling in the other hand decreases GDP, welfare and average human capital, while increasing attendance for all educational levels. We also conclude that increasing educational spending by decreasing other government spending or by increasing taxation benefit the economy in terms of GDP, welfare and average human capital, while decreasing the amount of child labor in the economy.

Other papers studying how households choose human capital accumulation and educational attainment are Brotherhood et al. (2023) and Brotherhood and Delalibera (2020). Brotherhood et al. (2023) study the effect of income based affirmative action on total human capital accumulation in a setting where you have both private and public schooling systems, while Brotherhood and Delalibera (2020), also in a setting where you have private and public schooling systems, studies the optimal government expenditures between basic and higher education.

The remainder of the paper is organized as follows. Section 2 describes the main model. Section 3 presents the calibration strategy. Section 4 presents the effects of counterfactual policies that might be implemented by the government. Finally, section 5 provides some concluding remarks.

2 Model

The model we use here is based on Restuccia and Urrutia (2004), Brotherhood and Delalibera (2020) and Brotherhood et al. (2023). It is composed of households, a representative final goods firm, and the government. Households are represented by overlapping generations, make decisions on consumption, savings, and education, and supply human capital to the final goods firm. The economy is small and households save using international credit markets. The final goods firm employs human capital and produces the consumption good. The government taxes families, provides educational services for free and transfers the rest of its revenues back to the population. There are 3 levels of education (elementary, high school and college) with 3 labor markets, one for each level of education. Time is discrete and each period in the model is interpreted as an 15-year period.

2.1 Households

We have 2 types of households, young and old, each having a density of 0.5. A young household is composed by a young child and a young parent, likewise, an old household has an old child and an old parent.

There are 3 occupations in the economy, $\omega \in \{lsk, msk, hsk\}$, which are low, medium and high skill occupations, respectively. What defines in which occupation individuals work is their degree of education, so that:

$$\omega|Educ = \begin{cases} lsk & \text{if } Educ = NHS \\ msk & \text{if } Educ = HS \\ hsk & \text{if } Educ = C \end{cases} \tag{1}$$

With this we have that education and skill are interchangeable terms for our model, so that saying a household's head educational level or saying his occupational skill is the same.

2.1.1 Young Households

Young households are characterized by 4 variables, parental education level $Educ_{p,y} \in \{\text{No High School (NHS), High School (HS), College (C)}\}$, parental human capital, $h_{p,y}$, young child innate ability, $\pi_{c,y}$, and the households' assets, a_y. Innate ability is distributed log-normally in the economy:

$$\log(\pi_{c,y}) \sim N(0, \sigma_{\pi_{c,y}}) \tag{2}$$

Young households decide how much to consume, c_y, if the child is going to elementary school or not, $ES_{c,y} \in \{0, 1\}$, if $ES_{c,y} = 1$ they choose how much to invest in the child's education $e_{es,y}$, how much time the child will spend in school, $s_{c,y}$, and how much time she will spend working $\ell_{c,y}$. Children have a endowment 1 of time which they divide between school and labor, $s_{c,y} + \ell_{c,y} = 1$. Finally, the young household also chooses how much to invest in assets for when they are old, a_o.

The young household's budget constraint is given by:

$$c_y + e_{es,y} + a_o = (1 - \tau_w)(w_{\omega|Educ} h_{p,y} + \xi_{c,y} w_{lsk} \ell_{c,y}) + (1 + (1 - \tau_r)r)a_y + T \tag{3}$$

where τ_w is the payroll tax, $w_{\omega|Educ}$ is the parent's wage given their occupation (or educational level), $\xi_{c,y}$ is how less a young child receives in average than a young parent who is in the low skill sector, τ_r is the tax on asset's returns, and T is a government transfer which all households receive.

The child investment in education $e_{es,y}$ is transformed in effective investment, $\hat{e}_{es,y}$ following the function:

$$\hat{e}_{es,y} = \alpha_{es}(g_{es} + e_{es,y}) \tag{4}$$

where α_{es} measures the effectiveness of public elementary schools and g_{es} is the government spending per pupil in elementary school.

Then, based on if the child goes to elementary school or not, on how much time she spends in school, on the childs' innate ability, on the parents' human capital and on effective educational investment, the acquired ability ($\pi_{c,o}$) for when they are old is given by the following equation:

$$\pi_{c,o} = ES_{c,y} * s_{c,y}^{\theta_s} \pi_{c,y} \left(\gamma_y h_{p,y}^{\phi_y} + (1-\gamma_y) \hat{e}_y^{\phi_y} \right)^{\theta_y/\phi_y} + (1 - ES_{c,y}) * \underline{\pi}_{c,o} \tag{5}$$

where $ES_{c,y}$ indicates whether a young child went to elementary school or not, $s_{c,y}$ is the time spent in school, γ_y is a parameter measuring the relative importance of parent's human capital for acquired ability[1], θ_s and θ_y measure the degree of returns to scale of time in school and parents' human capital and effective educational attainment, respectively, ϕ_y measures the elasticity of substitution between $h_{p,y}$ and $\hat{e}_{es,y}$, finally $\underline{\pi}_{c,o}$ is the acquired ability for children who do not go to elementary school.[2]

From when a household is young to when it is old, parental human capital suffers a shock $\varepsilon_{h,y} \sim N(0, \sigma_{\varepsilon_{h,y}})$ such that

$$\log(h_{p,o}) = \log(h_{p,y}) + \log(\varepsilon_{h,y}). \tag{6}$$

So, we can write the young household's value function as:

$$\begin{aligned} V_y(Educ_{p,y}, h_{p,y}, \pi_{c,y}, a_y) = & \max_{c_y, e_{es,y}, a_o, \ell_{c,y}, ES_{c,y}, s_{c,y}} u(c_y) + \beta \mathbb{E}[V_o(Educ_{p,o}, h_{p,o}, ES_{c,o}, \pi_{c,o}, a_o)] \\ & s.t. (1) \text{ to } (6) \end{aligned} \tag{7}$$

[1] $1 - \gamma_y$ is the relative importance of effective educational investments for acquired ability.

[2] Here it is important to note that, even if $\xi_{c,y} = 0$ it might still be worth for children not to go to high school, since they will accumulate $\underline{\pi}_{c,o}$ in acquired ability.

where $u(c_y)$ is a CRRA utility function given by

$$u(c_y) = \frac{(c_y)^{1-\sigma_c} - 1}{1 - \sigma_c}, \tag{8}$$

and σ_c is the relative risk aversion.

2.1.2 Old Households

An old household is characterized by parental education level $Educ_{p,o} \in \{\text{NHS, HS, C}\}$, parent's human capital, $h_{p,o}$, if the child went to elementary school or not, $ES_{c,o}$, the child's acquired ability, $\pi_{c,o}$ and its assets, a_o. They choose how much to consume, c_o, if $ES_{c,o} = 1$ they also decide whether the child is going to high school or not, $HS_{c,o} \in \{0, 1\}$ and, if $HS_{c,o} = 1$, how much to invest in education $e_{hs,o}$. If $HS_{c,o} = 1$ they also choose whether the child is going to college or not, $Coll_{c,o} \in \{0, 1\}$, and, if $Coll_{c,o} = 1$, how much to invest in education $e_{coll,o}$. Finally, they choose how much to invest in assets a_y.

If a child goes to high school, she spends η_{hs} of her time in it, and if she goes to college, another η_{coll}. Children have a time endowment of 1 which they divide between labor $l_{c,o}$, high school and college, such that $l_{c,o} + \eta_{hs} \times HS_{c,o} + \eta_{coll} \times Coll_{c,o} = 1$.

As for the old household, effective investment in education in high school and college, $\hat{e}_{hs,o}$ and $\hat{e}_{coll,o}$, are given by the following equations:

$$\hat{e}_{hs,o} = \alpha_{hs}(g_{hs} + e_{hs,o}) \tag{9}$$

$$\hat{e}_{coll,o} = \alpha_{coll}(g_{coll} + e_{coll,o}), \tag{10}$$

where α_{hs}, α_{coll}, g_{hs}, and g_{coll} are analogous to α_{es} and g_{es}, but for high school and college.

After the child finished its education, her acquired ability is transformed into human capital through the following equation:

$$h_{c,o} = \left[\gamma_o \pi_{c,o}^{\phi_o} + (1-\gamma_o)(\psi_{hs}(1-HS) + \psi_{coll}(1-Coll) + HS \times \hat{e}_{hs,o} + Coll \times \hat{e}_{coll,o})^{\phi_o}\right]^{\theta_o/\phi_o}, \tag{11}$$

where γ_o measures the relative importance of acquired ability in relation to returns to experience and effective educational investment, ψ_{hs} and ψ_{coll} are the returns to experience during the time the child would be in high school and college, respectively, θ_o is the scale effect for human capital accumulation, and ϕ_o is the elasticity of substitution between acquired ability and effective educational investment.

Finally, the old household's budget constraint is given by the following equation:

$$\begin{aligned} c_o + e_{hs,o} + e_{coll,o} + a_y =& (1-\tau_w)(\xi_{p,o} w_{\omega|Educ_{p,o}} h_{p,o} + l_{c,o}\xi_{c,o} w_{\omega|Educ_{c,o}} h_{c,o}) + \\ & (1 + (1-\tau_r)r)a_o + T, \end{aligned} \tag{12}$$

where $\xi_{c,o}$ ($\xi_{p,o}$) are how much an old child (parent) earns relative to a young parent. As happens with the young household, the old child's human capital suffers a shock $\varepsilon_{h,o} \sim N(0, \sigma_{\varepsilon_{h,o}})$ in the transition to being a young parent such that:

$$\log(h_{p,y}) = \log(h_{c,o}) + \log(\varepsilon_{h,o}). \tag{13}$$

We can then write the old household's value function $V_o(h_{p,o}, \pi_{c,o}, a_o)$ as:

$$\begin{aligned} V_o(Educ_{p,o}, h_{p,o}, ES_{c,o}, \pi_{c,o}, a_o) = & \max_{c_o, e_{hs,o}, e_{coll,o}, HS, Coll, l_{c,o}, a_o \geq 0} u(c_o) + \beta \mathbb{E}[V_y(Educ_{p,y}, h_{p,y}, \pi_{c,y}, a_y)] \\ & s.t. (1), (2) \text{ and } (9) \text{ to } (13) \end{aligned} \tag{14}$$

2.2 Firms

The final goods representative firm has the following CES production function:

$$Y_{labor} = A\left(((1-\theta_{msk}-\theta_{hsk})H_{lsk})^{\frac{\sigma_p-1}{\sigma_p}} + (\theta_{msk}H_{msk})^{\frac{\sigma_p-1}{\sigma_p}} + (\theta_{hsk}H_{hsk})^{\frac{\sigma_p-1}{\sigma_p}}\right)^{\frac{\sigma_p}{\sigma_p-1}} \quad (15)$$

where A is the economy's productivity, θ_{msk} and θ_{hsk} tells us the relative productivity for each sector, $H_s,\ s \in lsk, msk, hsk$ is the total human capital in each sector, and σ_p is the elasticity of substitution between sectors. It solves the following problem:

$$\max_{H_{lsk},H_{msk},H_{hsk}} Y_{labor} - w_{lsk}H_{lsk} - w_{msk}H_{mks} - w_{hsk}H_{hsk} \quad (16)$$

in order to maximize profits.

2.3 Government

Government finances itself by taxing households, offers free public education and transfers money to the population. The government excess funds are distributed back to the households via transfer. Denote by ν_{es} as the proportion of young children who attend elementary school, and ν_{hs} and ν_{coll} as the proportion of the old children who attend high school and college, respectively. Then government spending in education G is given by:

$$G = 0.5(\nu_{es}g_{es} + \nu_{hs}g_{hs} + \nu_{coll}g_{coll}) \quad (17)$$

Being Y the aggregate earnings in the economy, it is given by $Y = Y_{labor} + rA$, where A is total assets held by households. As government finances itself through taxing households, its budget is given by $\tau_w Y_{labor} + \tau_r rA$. So for the government budget to be balanced, we need that

$$G + \alpha_T T = \tau_w Y_{labor} + \tau_r r A, \tag{18}$$

where α_T is the effectiveness of government transfers. If $\alpha_T < 1$ the government is more efficient than individuals, and if $\alpha_T > 1$ the government is less efficient. In our baseline, we will set $\alpha_T = 1$.

2.4 Labor Market

In this section we will present how the supply and demand for labor are given for our model.

2.4.1 Labor Supply

There are 4 generations at each moment. We will breakdown the labor supply of each generation to each sector.

For the low-skilled sector we have that the young children's labor supply will be given by:

$$\begin{aligned} H_{lsk}^{c,y} = 0.5\xi_{c,y}\Bigg(\sum_{Educ_{p,y}} \int_{h_{p,y}} \int_{\pi_{c,y}} \int_{a_y} \quad & \mu_y(Educ_{p,y}, h_{p,y}, \pi_{c,y}, a_y) \\ & \mathbf{1}\{f_y^{ES}(Educ_{p,y}, h_{p,y}, \pi_{c,y}, a_y) = 1\} \\ & f_y^l(Educ_{p,y}, h_{p,y}, \pi_{c,y}, a_y) da_y d\pi_{c,y} dh_{p,y} + \\ \sum_{Educ_{p,y}} \int_{h_{p,y}} \int_{\pi_{c,y}} \int_{a_y} \quad & \mu_y(Educ_{p,y}, h_{p,y}, \pi_{c,y}, a_y) \\ & \mathbf{1}\{f_y^{ES}(Educ_{p,y}, h_{p,y}, \pi_{c,y}, a_y) = 0\} \Bigg), \end{aligned} \tag{19}$$

where $\mu_y(.)$ is the density function for young households, $\mathbf{1}$ is an indicator function, $f_y^{ES_{c,y}}$ and $f_y^{\ell_{c,y}}$ are the policy functions for young households elementary school attendance and

child labor provision. Young parent's labor supply is given by:

$$H_{lsk}^{p,y} = 0.5 \int_{h_{p,y}} \int_{\pi_{c,y}} \int_{a_y} \mu_y(1, h_{p,y}, \pi_{c,y}, a_y) h_{p,y} da_y d\pi_{c,y} dh_{p,y}$$

The old children's labor supply will be given by:

$$\begin{aligned} H_{lsk}^{c,o} = 0.5\xi_{c,o} \Bigg(& \underline{h} \sum_{Educ_{p,o}} \int_h \int_{a_o} && \mu_o(Educ_{p,o}, 0, h, \underline{\pi}_{c,o}, a_o) da_o dh_{p,o} + \\ & \sum_{Educ_{p,o}} \int_h \int_{\pi_{c,o}} \int_{a_o} && \mu(Educ_{p,o}, 1, h, \pi_{c,o}, a_o) \\ & && \mathbf{1}(f_o^{Educ_{c,o}}(Educ_{p,o}, 1, h, \pi_{c,o}, a_o) = NHS) \\ & && f_o^{h_{c,o}}(Educ_{p,o}, 1, h, \pi_{c,o}, a_o) da_o d\pi_{c,o} dh_{p,o} \Bigg) \end{aligned} \tag{20}$$

Where $\underline{h}$ is the human capital accumulated if a child does not go to elementary school,[3] $\mu_o(.)$ is the density function for old households, $f_o^{Educ_{c,o}}$ and $f_o^{h_{c,o}}$ are old households policy function for educational decisions and human capital accumulation. Finally, the old parent's labor supply is:

$$H_{lsk}^{p,o} = 0.5\xi_{p,o} \sum_{ES_{c,o}} \int_{h_{p,o}} \int_{\pi_{c,o}} \int_{a_o} \mu_o(1, ES_{c,o}, h_{p,o}, \pi_{c.o}, a_o) h_{p,o} da_o d\pi_{c,o} dh_{p,o} \tag{21}$$

For the medium and high skilled sectors, young children will not provide labor ($H_{msk}^{c,y} = H_{hsk}^{c,y} = 0$), so that we will only show the supply for young parents and old children and parents.

For the medium skilled sector, young parent's labor supply is given by:

$$H_{msk}^{p,y} = 0.5 \int_{h_{p,y}} \int_{\pi_{c,y}} \int_{a_y} \mu_y(2, h, \pi_{c,y}, a_y) h_{p,y} da_y d\pi_{c,y} dh_{p,y} \tag{22}$$

[3] In the model this will be given by $h_{c,o} = \left[\gamma_o \underline{\pi}_{c,o}^{\phi_o} + (1-\gamma_o)(\psi_{hs} + \psi_{coll})^{\phi_o}\right]^{\theta_o/\phi_o}$

Old children's labor supply is given by:

$$H_{msk}^{c,o} = 0.5(1-\eta_{HS})\xi_{c,o}\Bigg(\sum_{Educ_{p,o}}\int_h\int_{\pi_{c,o}}\int_{a_o} \mu(Educ_{p,o},1,h,\pi_{c,o},a_o) \mathbf{1}(f_o^{Educ_{c,o}}(Educ_{p,o},1,h,\pi_{c,o},a_o)=HS) f_o^{h_{c,o}}(Educ_{p,o},1,h,\pi_{c,o},a_o)da_o d\pi_{c,o}dh_{p,o}\Bigg) \tag{23}$$

and Old Parent's Labor supply is given by:

$$H_{msk}^{p,o} = 0.5\xi_{p,o}\sum_{ES_{c,o}}\int_{h_{p,o}}\int_{\pi_{c,o}}\int_{a_o}\mu_o(2,ES,h_{p,o},\pi_{c.o},a_o)h_{p,o}da_o d\pi_{c,o}dh_{p,o} \tag{24}$$

For the high-skilled sector we have that young parent's labor supply is given by:

$$H_{hsk}^{p,y} = 0.5\int_{h_{p,y}}\int_{\pi_{c,y}}\int_{a_y}\mu_y(3,h,\pi_{c,y},a_y)h_{p,y}da_y d\pi_{c,y}dh_{p,y} \tag{25}$$

Old children's labor supply is given by:

$$H_{hsk}^{c,o} = 0.5(1-\eta_{HS}-\eta_C)\xi_{c,o}\sum_{Educ_{p,o}}\int_h\int_{\pi_{c,o}}\int_{a_o} \mu(Educ_{p,o},1,h,\pi_{c,o},a_o) \mathbf{1}(f_o^{Educ_{c,o}}(Educ_{p,o},1,h,\pi_{c,o},a_o)=C) f_o^{h_{c,o}}(Educ_{p,o},1,h,\pi_{c,o},a_o)da_o d\pi_{c,o}dh_{p,o} \tag{26}$$

and old parent's labor supply is given by:

$$H_{hsk}^{p,o} = 0.5\xi_{p,o}\sum_{ES_{c,o}}\int_{h_{p,o}}\int_{\pi_{c,o}}\int_{a_o}\mu_o(3,ES,h_{p,o},\pi_{c.o},a_o)h_{p,o}da_o d\pi_{c,o}dh_{p,o} \tag{27}$$

We then have that for each sector $s \in \{lsk, msk, hsk\}$ the total labor supply is given by:

$$H_s^{supply} = H_s^{c,y} + H_s^{p,y} + H_s^{c,o} + H_s^{p,o} \tag{28}$$

2.4.2 Labor Demand

From (16) we have that the demand for human capital will be given by the following equation

$$H_s^{demand} = \left(\frac{(A\theta_s)^{\frac{\sigma-1}{\sigma}}}{w_s} \right)^{\sigma} Y \qquad s \in lsk, msk, hsk. \tag{29}$$

This also gives us that

$$\left(\frac{(A\theta_{lsk})}{w_{lsk}} \right)^{\sigma-1} + \left(\frac{(A\theta_{msk})}{w_{msk}} \right)^{\sigma-1} + \left(\frac{(A\theta_{hsk})}{w_{hsk}} \right)^{\sigma-1} = 1. \tag{30}$$

2.5 Equilibrium

The equilibrium is characterized by:

1. Value and policy functions solve households' equations;
2. Labor demand solves the final good firm's problem;
3. $w_i, i \in lsk, msk, hsk$ clears the labor market: the firm optimal labor demand is equal to the aggregate human capital supplied by households in each sector. The demand for labor in each sector is given by (29) while the supply is detailed in section 2.4.1;
4. The government budget is balanced;
5. Lump-sum transfers received by households are consistent with the governments budget condition;
6. The distributions of young and old households are constant over time and consistent with households' optimal decisions and the exogenous distribution of innate abilities. That is, denoting $Pr_i(E_{p,i} = Educ)$, $i \in \{y, o\}$ as the probability of parents having education $Educ \in \{NHS, HS, C\}$ for young and old households, $Pr_o(ES_{c,o} = ES | E_{p,o} = Educ)$ as the probability of children from old households having $ES \in \{0, 1\}$ given that their parents have $Educ \in \{NHS, HS, C\}$,

$\mu_y(h_{p,y}, \pi_{c,y}, a_y|E_{p,y})$ as the probability density function for variables $h_{p,y}, \pi_{c,y}, a_y$ conditional on young parents' education, and $\mu_o(h_{p,o}, \pi_{c,o}, a_o|E_{p,o}, ES_{c,o})$ as the probability function for variables $h_{p,o}, \pi_{c,o}, a_o$ conditional on old parents' and childrens' education.

$$Pr(E_{p,y}) = \sum_{E_{p,o}} Pr(E_{p,o}) \sum_{ES_{c,o}} Pr(ES_{c,o}|E_{p,o}) \quad \int_{h_{p,o}} \int_{\pi_{c,o}} \int_{a_o} \mu_o(h_{p,o}, \pi_{c,o}, a_o|E_{p,o}, ES_{c,o})$$
$$\mathbf{1}\{f_o^E(h_{p,o}, \pi_{c,o}, a_o, E_{p,o}, ES_{c,o}) = E_{p,y}\}$$
$$da_o d\pi_{c,o} dh_{p,o} \tag{31}$$

$$Pr(E_{p,y})\mu_y(h_{p,y}, \pi_{c,y}, a_y|E_{p,y}) = f_\pi(\pi_{c,y}) \sum_{E_{p,o}} Pr(E_{p,o}) \sum_{ES_{c,o}} Pr(ES_{c,o}|E_{p,o})$$
$$\int_{h_{p,o}} \int_{\pi_{c,o}} \int_{a_o} \mu_o(h_{p,o}, \pi_{c,o}, a_o|E_{p,o}, ES_{c,o})$$
$$\mathbf{1}\{f_o^E(h_{p,o}, \pi_{c,o}, a_o, E_{p,o}, ES_{c,o}) = E_{p,y}\}$$
$$f_o^h(h_{p,o}, \pi_{c,o}, a_o, E_{p,o}, ES_{c,o}) f_{\varepsilon_h}\left(\frac{h_{p,y}}{f_o^h}\right)$$
$$\mathbf{1}\{f_o^a(h_{p,o}, \pi_{c,o}, a_o, E_{p,o}, ES_{c,o}) = a_y\} da_o d\pi_{c,o} dh_{p,o} \tag{32}$$

$$Pr(E_{p,o}) = Pr(E_{p,y}) \tag{33}$$

$$Pr(ES_{c,o}|E_{p,o}) = \int_{h_{p,y}} \int_{\pi_{c,y}} \int_{a_y} \quad \mu_y(h_{p,y}, \pi_{c,y}, a_y|E_{p,o})$$
$$\mathbf{1}\{f_y^{ES}(h_{p,y}, \pi_{c,y}, a_y, E_{p,y}) = ES_{c,o}\} \tag{34}$$
$$da_y d\pi_{c,y} dh_{p,y}$$

$$Pr(ES_{c,o}|E_{p,o})\mu_o(h_{p,o}, \pi_{c,o}, a_o|E_{p,o}, ES_{c,o}) = \int_{h_{p,o}} \int_{\pi_{c,o}} \int_{a_o} \mu_y(h_{p,y}, \pi_{c,y}, a_y|E_{p,o})$$
$$\mathbf{1}\{f_y^{ES}(h_{p,y}, \pi_{c,y}, a_y, E_{p,y}) = ES_{c,o}\}$$
$$\mathbf{1}\{f_y^{\pi}(h_{p,y}, \pi_{c,y}, a_y, E_{p,y}) = \pi_{c,o}\} f_{\varepsilon_h}\left(\frac{h_{p,o}}{h_{p,y}}\right),$$
$$\mathbf{1}\{f_y^a(h_{p,y}, \pi_{c,y}, a_y, E_{p,y}) = a_o\} da_y d\pi_{c,y} dh_{p,y} \tag{35}$$

where f_y^{ES}, f_y^{π} and f_y^a are the policy functions for elementary school attendance, acquired ability and assets for young households, f_o^E, f_o^h and f_o^a are the policy functions for educational level, human capital and assets for old households, and f_π and f_{ϵ_h} are the density functions for $\pi_{c,y}$ and ϵ_h.

3 Calibration

In this section we will discuss how to calibrate the model and which moments we will try to match.

We have 27 exogenous variables, which will be divided into two sets of parameters. The first set will have predefined values taken from the literature for Brazil or when there is a clear interpretation for that variable. The second set of variables will be calibrated in order to match some moments from the data.

3.1 Predefined Variables

For the predefined variables, we set β to 0.947 per year, following Brotherhood and Delalibera (2020), for r, we use average real returns for the savings account from 2001 to 2010, for τ_w and τ_r we use federal government expenditures over GDP, $\xi_{c,o}$ and $\xi_{p,o}$ are estimated along with the elementary school, high school and college wage from the data, σ_c comes from Restuccia and Urrutia (2004), σ_p comes from Havranek et al. (2020), η_{hs} is the time spent in high school and η_{coll} the time spent in college, 3 and 4 years, respectively. Finally A is normalized to 100, as we have constant return to scales this is without loss of generality.

- $\beta = 0.947^{15}$;
- $r = (1.0174)^{15}$;
- $\tau_w = \tau_r = 0.182$;
- $\xi_{c,o} = 0.7193, \xi_{p,o} = 1.1985$;

- $\sigma_c = 1.5$;
- $\sigma_p = 0.46$;
- $\eta_{hs} = 3/15$;
- $\eta_{coll} = 4/15$;
- $A = 100$.

Also, based on data for government spending in different levels of education we have that:

$$\frac{g_y \nu_{es} + g_{hs}\nu_{hs} + g_{coll}\nu_{coll}}{Y} = 0.049 \tag{36}$$

$$g_{es}/g_{coll} = 6287.79/26400.07 * 9/4 \tag{37}$$

$$g_{hs}/g_{coll} = 4972.97/26400.07 * 3/4 \tag{38}$$

$$T = (\tau - 0.049)Y \tag{39}$$

That is, we force the model such that government expenditures on education are 4.9% of total GDP, government expenditures on elementary and high school are 53.59% and 14.13% of government expenditure on college, respectively.[4]

3.2 Calibrated Variables

The second set of exogenous variables will be calibrated to match some moments we get from the data. Listed below are these variables

- $\xi_{c,y}$
- $\alpha_{es}, \alpha_{hs}, \alpha_{coll}$
- $\underline{\pi}_{c,o}, \gamma_y, \gamma_o, \theta_s, \theta_y, \theta_o, \phi_y, \phi_o, \psi_{hs}, \psi_{coll}$

[4]This data is available at the INEP website at https://www.gov.br/inep/pt-br/acesso-a-informacao/dados-abertos/indicadores-educacionais/indicadores-financeiros-educacionais.

- $\sigma_{pi}, \sigma_{h,y}, \sigma_{h,o}$
- A_{msk}, A_{hsk}

We will set θ_s and θ_y to be equal to 1 and also set $\sigma_{h,y} = \sigma_{h,o}$. This leaves us with 16 parameters to calibrate.

The moments we will try to match and the source for each moment are shown in the table 1.

The fraction of Young Parents with no education, at most primary education, high school and college comes from the 2010 Brazilian census by using the variable "EDATTAIND". We define that an individual has:

- No schooling if the code for the variable is 110;
- At most primary education if the code is 110, 120, 130, 211 or 212;
- At most secondary education if the code is 221 or 311;
- College education if the code is 312 or 400.

The fraction of children providing child labor is computed by seeing the fraction of individuals between the age of 10 and 15 who are economically active.

For the labor market statistics we will use the hourly wage for individuals who usually work 20 or more hours a week. After doing this, we take the log of the hourly income for each individual. Then, to estimate the no elementary school wage premium, the high school wage premium, the college wage premium, $\xi_{c,o}$ and $\xi_{p,o}$ we run a regression of the log hourly wages for individuals who have between 16 and 60 years of age on 5 dummies:

- No schooling;
- High school;
- College;
- Old Child;

- Old Parent.

The Gini index and standard deviation of log earnings are calculated considering the hourly wages from young and old parents.

Finally, when using the 2014 PNAD we consider only those who answered the mobility questionnaire and see the fraction of young parents whose fathers had at most primary education and the fraction of children who also had at most primary education, doing the same thing for high school and college.

3.3 Baseline Economy

Table 2 shows the values used for the 16 calibrated parameters after the calibration.

Defining that a moment is well matched if $|moment_{model} - moment_{data}|/moment_{data} \leq 0.2$, the model seems to have a problem matching young parents with at most high school; the ratio of higher and basic education expenditures; wage ratio between young children and young adults in the low skill sector; no elementary school wage premium; labor income Gini; low skill parents with low skill children; high skill parents with high skill children.

Table 3 shows the values for the targeted moments in the data and in the model for the values of the parameters show above.

After calibrating the model, we now try to see how it matches some untargeted moments from the data. Initially, we'll see how well the model matches 23 moments from the data. Table 4 shows us that the model matches relative incomes and the fraction of parents in each quintile of labor income by level of education well. When looking at child labor provision by parent education, we see that, while the model overestimates child labor for low skill families, it underestimates it for medium and high skill families. As for inter-generational education mobility, the model only does a good job matching low skill parents with medium skill children and high skill parents with low skill children.

Table 5 summarizes the baseline economy.

Now, we will analyse how children in different brackets of innate talent behave in our economy. To do this, we divide children in two types:

- Low innate ability: those below the 33^{th} percentile of innate ability;
- High innate ability: those above the 66^{th} percentile of innate ability.

We will also see what happens depending on whether the child comes from a low, medium or high skilled household.

First, tables 6, 7 and 8 show us the educational attainment, human capital distribution and wage distribution for children below the 33^{th} percentile of innate ability for the whole economy and depending on parental education.

From table 6 we can see that the fraction of children attending elementary school and high school is smaller in this bracket of innate ability than for average for the economy, but that for high school the inequality in attendance is much higher when comparing children that come from low, medium and high skill households. We have that 83.9% of these children attend elementary school, but we also see, when comparing children from different types households, those who have college educated parents are 1.19 and 1.05 times more likely to attend than those who have parents who went at most to elementary and high school respectively. This discrepancy is even bigger when looking at high school, with 44.8% of the children in this bracket attending overall, but children from high skilled households are 3.1 and 2.05 times more likely to attend than those who come from low and medium skilled ones respectively.

Looking at human capital accumulation in table 7, we can see that 39.1% of low innate ability children end up above the 25^{th} percentile of human capital, but, once again those from high skill families are 2.04 and 1.45 times more likely to end up above this percentile than the ones born in low and medium skilled families. Similar dynamics can be observed for wages in table 8.

Tables 9, 10 and 11 bring us information for children above the 66^{th} percentile of innate ability.

Table 9 shows us that 55.2% of the children in this bracket of human capital goes at least until high school, but that this number is 2.33 and 1.80 times higher for children from high skilled families when comparing them to those from low and medium skilled ones. We

also have that 32.2% of them attend college, but, once again, children from high skilled families are 4.53 and 3.03 times more likely to attend this level of education than those from low and medium skilled ones respectively.

Now looking at table 10 we can see that most children in the right tail of the human capital distribution, 59.4%, are above the 75th percentile of the human capital distribution, but this varies quite a bit depending on the child's background. Looking at children born in different household types, we have that the ones with high skilled parents are 1.97 and 1.48 than the ones with low and medium skilled ones. A similar dynamic can be observed for wages in table 11.

4 Counterfactuals

In this section we implement 5 different policies and measure their impacts in the economy. First, we will see what happens when child labor is banned, but children are not forced to go to school. Second, we see what happens if we force children to go to school. Then, we see how the economy responds when we modify the ratio between expenditures in basic education and higher education per year/pupil. After that, we see what happens when we change the percentage of government expenditures in education, maintaining taxation constant. Finally, we see what happens when we change the taxation level for the economy.

4.1 Child Labor Ban and Compulsory Schooling

In these first two exercises, we first implement a policy where child labor is banned. To do this, we will set $\xi_{c,y}$ to zero.[5] Secondly, we also impose a policy where child labor is banned ($\ell_{c,y} = 0$) and young children are forced to attend elementary school ($ES = 1$). Table 12 shows what happens to the economy when each of these policies are in place.

First looking at the impacts of a child labor ban policy, we can see that GDP and welfare increase 0.9% and 1.2%, respectively. Although average welfare increases, there is an increase in low skill welfare and a decrease in both medium and high skill welfare. We also see an increase in average human capital, 1.1%, where there is an increase of 5% for the low skill sector, and decrease of 3.4% and 1.2% for the medium and high skill sectors. High school and college wage premia drop by 8.0% and 5.9% respectively. Educational attainment increases for every educational level, but specially for elementary school, and child labor almost vanishes. We also see that expenditure per pupil drops for all educational levels due to both an increase in the number of students.

Effects for the compulsory schooling policy go in the other direction when compared to the ones from a child labor ban. We can see that in this case GDP drops 0.8% while welfare drops 0.7%. When looking at average human capital, it decreases by 0.8%, having

[5] When we do this, some children might still want to engage in child labor if the final acquired ability doing this, $\underline{\pi}_{c,o}$, is higher than the acquired ability she would have after attending elementary school full-time.

an increase in the low skill sector of 4.1%, a decrease of 9.7% in the medium skill sector and of 3.8% in the high skill sector. As for wage premia, there is a decrease of 12.8% and 7.2% respectively. Once again, there is an increase in attendance for all educational levels even when compared to what happens after a child labor ban, with elementary school being universal now. Finally, expenditure per pupil drops for all educational levels due to both an increase in the number of students and the decrease in government spending.

Now, tables 13, 14, 15 will show how both these policies impact educational attainment, human capital distribution and wage distribution for children in the left tail of the innate ability distribution.

First, looking at table 13, we can see that not only elementary school enrollment increases, but high school education also increases significantly for both policies, independent of parental education. The difference between the policies here seems to be for high school attendance, while when going from a child labor ban to a compulsory schooling policy high school attendance raises for children both from low and medium skill households, it decreases for high skill households. When looking at college attendance, it increases for children from all types of household. For a child labor ban, now children from high skilled households are almost equally likely to attend elementary school when compared with children from low and medium skilled ones (1.19 and 1.05 for the baseline economy) and 2.61 and 2.16 times more likely to attend high school (3.10 and 2.05 for the baseline economy). When looking at a compulsory schooling policy, children from low, medium and high skilled households are equally likely to go to elementary school, but children from high skilled households are 2.18 and 1.93 times more likely to attend high school than those from the lower skilled ones.

Table 14 shows that while a child labor ban policy does not affect the overall distribution of human capital for children below the 33^{th} percentile of innate ability, a compulsory schooling policy seems to concentrate these children below the 25^{th} percentiles. When looking at differences based on the skill of the household these children come from, we see that a child labor ban makes a child from a high skilled household 1.87 and 1.53 times more likely to be above percentile 25 of human capital while for a compulsory schooling

policy these numbers are 2.99 and 2.02 (these numbers are 2.04 and 1.45 for the baseline economy).

Finally, looking at the wage distribution in table 15, we see that both policies analysed here do not seem to have a big impact on the overall wage distribution for these children. When we look at the distribution by household type, when a child labor ban is in place we see that children from high skilled households are 3.61 and 2.03 times more likely to be above the 25^{th} percentile of wages, while these numbers are 3.28 and 2.21 for a compulsory schooling policy (3.79 and 1.94 at the baseline).

Taking everything together, both policies decrease inequality in educational achievement for children below the 33^{th} percentile of innate ability who come from different types of household. When we look at human capital and wages, both policies reduce inequality between low and high skilled households and increase inequality between medium and high skilled ones.

Now, tables 16, 17, 18 will show how the child labor ban and compulsory schooling policies impact educational attainment, human capital distribution and wage distribution, respectively, for children in the right tail of the innate ability distribution.

First, table 16 shows that the impact of a child labor ban policy on educational attainment is small for these children. Looking at differences for each household type, we see that when a child labor ban is in place children from high skilled households are 2.24 and 1.91 times more likely to go to high school than those from low and medium skilled ones respectively, while for a compulsory schooling policy they are 2.26 and 1.82 times more likely to go (these numbers are 2.33 and 1.80 for the baseline economy). When looking at college, a child from a high skilled household has a probability 4.41 and 3.16 times higher to attend higher education with a child labor ban policy and 4.12 and 2.65 times higher for a compulsory schooling policy (4.53 and 3.03 for the baseline economy).

Tables 17 and 18 show that the child labor ban policy seems to have a small impact on both overall human capital and wage distribution for children in the right tail of the innate ability distribution. The compulsory schooling policy on the other hand transfers children who are between percentiles 75 and 90 to percentiles between 50 and 75 for both

human capital and wages with a bigger effect for human capital.

When looking at the distribution of human capital by household type, the child labor ban policy makes a child from a high skilled household 3.04 and 1.97 times more likely to be above the 75^{th} percentile of human capital than children from low and medium skilled households respectively, these numbers are 2.80 and 2.03 for the compulsory schooling policy (3.31 and 1.92 for the baseline economy). When looking at wages, the child labor ban policy makes a child from a high skilled household 3.28 and 2.21 times more likely to be above percentile 75 while for the compulsory schooling policy these numbers are the same 2.80 and 2.03 as for human capital (3.52 and 2.06 for the baseline economy).

We can see that, different from what happened to children with low innate ability, when looking at high school attendance, these policies have a small impact of decreasing educational inequality between children from low and high skilled households while it increases it when comparing those from medium and high skilled ones. The same thing happens when looking at this inequality in human capital and wages.

4.2 Basic vs. Higher Education Spending

Now, we will see the impacts on the economy when we change the proportion of spending in elementary and high school in relation to what is spent in college. To do this we will change equations (37) and (38) so that the following is true.

$$\frac{g_y \nu_{es} + g_{hs}\nu_{hs} + g_{coll}\nu_{coll}}{Y} = 0.049 \tag{40}$$

$$g_{es}/g_{coll} = \alpha * 9/4 \tag{41}$$

$$g_{hs}/g_{coll} = \alpha * 3/4 \tag{42}$$

$$T = (\tau - 0.049)Y \tag{43}$$

With α being the ratio between expenditures in elementary school and high school per pupil per year. We will then vary the values for α and see what happens with the economy.

For the baseline we have that $\alpha = 0.2381$ for elementary school and $\alpha = 0.1883$ for high school.

We can see in table 19 that increasing the ratio between per year/pupil expenditure between basic and higher education increases GDP and welfare monotonically while child labor increases when going from 0.2 to 0.3 and then decreases monotonically. We also see a slight increase in elementary school attendance, no clear effect on high school attendance and a big increase in college attendance. Another notable change is that high school wage premium increases while college wage premium decreases, with them the first surpassing the second for α values bigger than 0.7. Finally, we see an increase in per pupil expenditure in elementary school and high school and a decrease for expenditures in college.

Table 20 shows us that elementary school attendance rises slowly, with increases for both low and medium skilled family children. We can also see that high school attendance decreases, with this effect being higher for α values bigger than 0.6, when looking at children from different household types, we observe a decrease for both low and high skilled households and an increase for those from medium skilled ones. Finally, college attendance rises fast for children in this bracket of innate ability for all household types. When looking at inequality between household types, we see that for high school the ratio between attendance for children from high skilled households and low and medium skilled households decreases for α values bigger than 0.6. As for college, this ratio decreases monotonically for all values of α.

Now, looking at human capital accumulation, table 21 shows that an increasing α from 0.2 until 0.5 increases the number of children above percentile 25 of the distribution, then increasing it from 0.5 to 0.6 decreases it sharply and further increasing it until 1.0 increases this fraction once again. When looking at the ratio between the number of children from high skilled households and from low and medium skilled ones, we can see the same dynamics, but with a decrease.

Table 22 shows a similar pattern for wages when comparing to what happens with human capital, but instead of the cutoff being when α is equal to 0.6 it is when it is equal to 0.7.

We have that increasing expenditures per pupil/year in basic education relative to higher education decreases inequality between children from low and high and medium and high skilled households in educational attainment, human capital accumulation and wages for children with low innate ability.

When looking at children in the right tail of the innate ability distribution, we see that high school attendance rises, with children from lower and medium skill households attending more high school and those from high skill families, less. College attendance decreases, with attendance falling from children from low and high skill families and rising for those from medium skill families.

Looking at human capital, table 24 shows that there is almost no impact for representation between percentiles 0 and 50. For percentiles 50 to 75, we have no effect overall, but there is decrease in representation for children from medium skilled households and an increase for those coming from high skilled households. Betweem percentiles 75 to 90 there does not seem to be a clear effect of the changes in alpha Between percentiles 90 and 95 when going from $\alpha = 0.2$ to $\alpha = 0.3$, then it is stable between 0.3 and 0.5, falling from 0.5 to 0.6 an stabilizing again from 0.6 until 1.0, this dynamic is observed. Finally, for percentiles 95 to 100, we see an increase in representation for children from low and medium skilled households and a decrease in those from high skilled ones.

Table 25 shows that dynamics similar to what we observe for human capital are observed for wages.

For relative expenditures in basic vs. higher education, when expenditure in basic education rises, we have a rise in GDP and welfare up to a certain point and we also see a decrease in inequality of human capital accumulation within levels of innate ability for both children in the left tail and right tail of innate ability distribution.

We have that increasing expenditures per pupil/year in basic education relative to higher education decreases inequality between children from low and high and medium and high skilled households in educational attainment, human capital accumulation and wages for children with high innate ability.

4.3 Fraction of Government Expenditures in Education

In the baseline scenario, we set $\frac{G}{\tau Y} = \frac{0.049}{0.182} = 0.269$. Now we will set $\frac{G}{\tau Y}$ to different values, that is, we will change the distribution of government expenditures between education and transfers, and see how this affects the economy and talent distribution.

Table 26 shows that the bigger the fraction the government expends in education in relation to its budget, the higher the GDP, welfare and average human capital while child labor decreases. When looking at educational attainment, there is an increase in elementary school attendance, but a decrease in both high school and college.

Now, when looking at talent distribution in the economy, we will focus on when we increase the fraction of government expenditures in education from 0.269 to 0.3.

When looking at children in the left tail of the innate ability distribution, table 27 show us that elementary school attendance increases with increases in the fraction of expenditures spent in education, while for college and high school they are decreasing. When we increase this fraction from 0.269 to 0.3, we see that this increases attendance for children from all household types while relative attendance between low and high and medium and high skilled households almost does not change. Then, looking at high school, we have an increase in attendance for children from high skilled households and a decrease for those from low and medium skilled ones, which increases inequality between children from different household types.

When looking at human capital distribution in table 28, we see that increasing the fraction of government spending in education from 0.269 to 0.3 leads to a decrease in children from this bracket of innate ability above percentile 25 of the human capital distribution for all household types. We now have that a child from a high skilled household is 2.54 and 1.73 times more likely to be above the 25^{th} percentile of the distribution than those from low and medium skilled ones respectively (2.04 and 1.45 for the baseline economy).

Table 29 shows us that the effect of this increase in relative government expenditures in education increases the fraction of children above the 25^{th} percentile of wages for children with low innate ability for all household types. Also, this increase makes a child from

a high skilled household 3.16 and 1.97 times more likely to be above percentile 25 than children from low and medium skilled families (3.79 and 1.97 for the baseline economy).

We can see that an increase from 0.269 to 0.3 in the fraction of government expenditures that go to education makes children with low innate ability more likely to go to elementary school and less likely to go to high school. When looking at human capital, this change also makes them less likely to be above percentile 25 of human capital, also increasing differences between the different household types. However, the effect for wages go in the opposite direction of that for human capital, increasing the chance that these children are above the 25^{th} percentile, decreasing differences between children from low and high skilled households while not impacting the difference between those from medium and high skilled ones.

Now we are going to see what happens for children with high innate ability. Looking at table 30 we see that there is an increase in high school and college attendance when we raise the fraction of government expenditures in education from 0.269 to 0.3. When expenditures in education are higher we have that a child from a high skill household is 2.13 and 1.71 times more likely to attend high school than one from a low and medium skilled one respectively (these numbers are 2.33 and 1.80 for the baseline economy). Looking at college, they are 4.79 and 2.80 times more likely to attend (4.53 and 3.03 for the baseline).

When looking at human capital accumulation in table 31, we see that this increase in education spending increases the fraction of high innate ability children above percentile 75 for all household types. When the fraction spent in education is of 0.3, we have that a child from a high skill family is 1.87 and 1.46 times more likely to be above the 75^{th} percentile against 1.97 and 1.48 for when this fraction is 0.269.

Finally, table 32 shows us that the same dynamics observed for human capital happens with wages. The increase in government education expenditures increase the fraction of children in the upper bracket of innate ability above the 75^{th} percentile of wages for all household types. With more education expenditures, a child from a high skilled family is 1.77 and 1.44 times more likely to be above percentile 75 of wages than those from low and medium skilled ones respectively, these numbers are 1.91 and 1.51 for the baseline

economy.

Taking everything together we have that an increase in government education expenditures increases educational attainment for children with high innate ability for all household types. It also lowers discrepancies between different household types for high school attendance, while increasing the discrepancy between low and high skilled households and lowering it between medium and high skilled ones for college. When looking at human capital and wage distribution, this same increase increases the number of children from this bracket of innate ability above the 75^{th} percentile of these distributions and decrease inequality between the different types of households.

4.4 Taxation

Finally, we will set taxation from the government, τ, to different values and see how this affects the economy. In the baseline economy we have that $\tau = 0.182$. For this counterfactual exercise, we will focus our analysis on changes from the baseline economy to when $\tau = 0.2$ and to $\tau = 0.3$.

We can see from table 33 that GDP, welfare and average human capital increases with raises in taxation. Although this happens, we can divide the effects of taxation in two parts, first there is the taxation dead weight, which decreases GDP, second there is a rise in education spending, which we know from the previous exercise increases GDP. We can see also that the overall increase in welfare comes mainly from low and medium skilled families. Finally, we see that the fraction of individuals with at least elementary school increases, the fraction of individuals with at least high school increases a bit and then decreases and the number of individual who access higher education decreases with an increase in taxation.

When looking at educational attainment in table for children in the left tail of the innate ability distribution 34, we see the same pattern as for the economy as a whole, with a increase in elementary school attendance, and a decrease in both high school and college attendance. When analysing it by household type, we see that increases in taxation decrease the ratio of the probability of attending elementary school between children from

high skilled households and low and medium skilled households.

When looking at human capital, table 35 shows us that an increase in taxation from 0.182 to 0.3 lowers the number of children with low innate human capital above the 25^{th} percentile, but while when increasing taxation from 0.182 to 0.2 decreases the number of children from all types of households, further increasing it to 0.3 increases the number of children from low skilled households and lowers the number of children from medium and high skilled households in this bracket of human capital. When the economy has a taxation of 0.3, a child from a high skilled household is 1.88 and 1.38 times more likely to be above percentile 25 of human capital than children from low and medium skilled households respectively.

Table 36 shows us that increasing taxation from 0.182 to 0.3 monotonically increases the number of children from low skilled households and decreases the number of children from high skilled households above the 25^{th} percentile of wages, while the effect on the average is almost null. With that, the probability that a child with low innate ability from a high skilled household is above this percentile is 1.88 and 1.39 times higher than the same probability for those from low and medium skilled ones (3.79 and 1.94 in the baseline).

For children in the right tail of the innate ability distribution, table 37 shows an increase in overall educational attainment, with a big effect specially in high school attendance for children from low and medium skilled households. When looking at college, we see different patterns depending on the type of household, with an initial increase for all household types when going from $\tau = 0.182$ to $\tau = 0.2$. Then, when going from $\tau = 0.2$ to $\tau = 0.3$ we see a further increase but for children from low skilled households. We see that, when $\tau = 0.3$ a child from a high skill household is 1.72 and 1.21 times more likely to go to high school than those from low and medium skilled households (2.33 and 1.80 in the baseline economy). When looking at college these numbers are 5.40 and 2.17 (4.53 and 3.03 in the baseline economy).

As for human capital, table 38 shows us that we increase the number of children with high innate ability above percentile 75 when we increase taxation from 0.182 to 0.3. Also, when we have a taxation of 30%, a child from a high skilled household is 1.73 and 1.38

times more likely to be above the 75^{th} percentile of human capital than children from low and medium skilled ones (1.97 and 1.48 for the baseline economy).

Looking at wages, table 39 shows us that we increase the number of children with high innate ability above percentile 75 when we increase taxation from 0.182 to 0.3. Also, when we have a taxation of 30%, a child from a high skilled household is 1.60 and 1.26 times more likely to be above the 75^{th} percentile of human capital than children from low and medium skilled ones (1.91 and 1.51 for the baseline economy).

5 Conclusion

In this paper we study how different economic policies impact child labor, GDP, welfare and talent allocation in the economy from a quantitative macroeconomic perspective.

To do this, we develop a model and calibrate it using Brazilian data from 2010. We can see that the model performs relatively well in terms of fitting targeted and non-targeted moments. The calibrated framework reproduces several characteristics of the economic environment, such as high school and college wage premium, a high level of inequality in labor income and child labor provision by parental level of education.

We then analyze how five different policies impact the economy, them being: a child labor ban; a compulsory schooling policy; redistribution of educational government expenditures between higher and basic education; redistribution of government expenditures between education and transfers; changes in taxation.

First, we find that, contrary to what is expected, a child labor ban in the economy raises GDP, welfare and average human capital. It also increases educational attainment for all educational levels. When looking at talent distribution, we have that this policy decreases discrepancies in human capital and wages between low and high skilled families while increasing it between medium and high skilled ones. When implementing compulsory schooling, we have a decrease in GDP, welfare and average human capital, while effect for educational attainment and talent distribution are similar to those that happen with a child labor ban.

Redistributing educational expenditures from higher education towards basic education has a small effect of increasing GDP, welfare and average welfare. When looking at talent distribution, we have that increases in basic education expenditures decrease inequality between low and high and medium and high skilled households in educational attainment, human capital accumulation and wages for low innate ability children and for those with high innate ability.

Then, redistribution of government expenditures from transfers to education increases GDP, welfare, average human capital and lowers child labor. When looking at educational

attainment, it increases elementary school while lowering high school and college attendance. Looking at talent distribution for low innate ability children, they are more likely to go to elementary school and less likely to go to high school, less likely to be above the 25^{th} percentile of human capital and more likely to be above the same percentile of wages. For human capital, differences between children from different household types increase for human capital while it decreases between those from low and high skilled and does not change for those from medium and high skilled ones for wages. For high innate ability children, this increases educational attainment for all household types and also increases the fraction of children above percentile 75 for human capital and wages, also decreasing inequality between the children from different types of household.

Finally, an increase in taxation has two effects in the economy's GDP, it both increases taxation dead-weight while at the same time increasing education expenditures. These two effects go in different directions, but in our analysis the second one dominates, so that GDP increases with increases in taxation. Welfare, average human also increase while child labor decreases. Elementary school attendance increases, while high school and college attendance decrease with increases in taxation. When looking at children with low innate ability, we see that increasing taxation from 0.182 to 0.3 decreases inequality between children from high skilled and low and medium skilled households when looking at human capital and wages. The same effect can be seen when considering children with high innate ability.

Figures and Tables

Table 1: Target Moments

Variable	Source
Household discrete choices	
Young Parents with no Education	2010 Brazilian Census
Young Parents with at most Primary Education	2010 Brazilian Census
Young Parents with high school	2010 Brazilian Census
Young Parents with college	2010 Brazilian Census
Young children providing child labor	2010 Brazilian Census
Household continuous choices	
Educ. expenditure over GDP	2002-2003 POF
Educ. expenditure (higher/basic)	2002-2003 POF
Labor market statistics	
Standard Deviation of (log) Labor Earnings	2010 Brazilian Census
Wage ratio between children and young adults in the low skill sector	2010 Brazilian Census
High School Wage Premium	2010 Brazilian Census
College Wage Premium	2010 Brazilian Census
No Elementary School Wage Premium	2010 Brazilian Census
Labor income Gini	2010 Brazilian Census
Intergenerational Education Mobility	
Percentage of Less than Primary Parents with Less than primary Education	2014 PNAD
Percentage of High School Parents with High School Education	2014 PNAD
Percentage of College Parents with College Education	2014 PNAD

Notes: This table reports the target moments from the data and the source from where these moments are being calculated.

Table 2: Calibrated Parameters Values

Parameter	Value
θ_{lsk}	0.2778
θ_{msk}	0.3240
θ_{hsk}	0.3980
$\xi_{c,y}$	0.0557
σ_h	0.1326
σ_π	1.5506
α_{es}	0.6116
α_{hs}	0.3877
α_{coll}	0.6325
γ_y	0.4120
γ_o	0.9787
ϕ_y	-1.8961
ϕ_o	-1.0139
ψ_{hs}	0.0274
ψ_{coll}	0.0722
θ_l	1.0000
θ_y	1.0000
θ_o	0.4968
$\underline{\pi}_{c,o}$	0.0067

Notes: This table reports the values for the calibrated parameters from the model. Here, $\theta_l = \theta_y = 1$ are predefined, while the other parameters are set to mimic targeted moments from the data presented in table 1.

Table 3: Targeted Moment Values: Data vs. Model

Variable	Data	Model
Panel A: Household Discrete Choices		
Young Parents with no Education	0.0588	0.0539
Young Parents with at most Primary Education	0.5982	0.5185
Young Parents with high school	0.2635	0.3243
Young Parents with college	0.1383	0.1572
Young children providing child labor	0.1094	0.1245
Panel B: Household Continuous Choices		
Educ. expenditure over GDP	0.0255	0.0205
Educ. expenditure (higher/basic)	0.3077	0.0683
Panel C: Labor Market Statistics		
Standard Deviation of Log Labor Earnings	0.9432	0.8509
Wage Ratio Between Children and Young Adults in the Low Skill Sector	0.4973	0.1179
No Elementary School Wage Premium	0.7117	0.1777
High School Wage Premium	1.4916	1.5875
College Wage Premium	3.2631	3.1993
Labor Income Gini	0.5303	0.7162
Panel D: Intergenerational Education Mobility		
Low Skill Parents with Low Skill Children	0.4787	0.6579
Medium Skill Parents with Medium Skill Children	0.3787	0.3178
High Skill Parents with High Skill Children	0.8484	0.4646

Notes: This table reports targeted moments from the data and those from the model. In panel A we see households decision on discrete choices, such as education education and provision of child labor, here represented by the fraction of young households who choose $\ell_{c,y} > 0$. Panel B presents household's continuous decisions on educational investment. Panel C presents labor market statistics for the economy as a whole. Panel D presents statistics for intergenerational educational mobility, presenting the fraction of children who end up in the same skill sector as their parents.

Table 4: Untargeted Moment Values: Data vs. Model

Variable	Data	Model
Panel A: Income Distribution, Relative Incomes		
p90/p10	9.3333	9.5550
p90/p25	5.6000	5.5821
p90/p50	3.7333	3.0821
p90/p75	2.0533	1.7478
Panel B: Fraction of Low Skill Parents in Each Income Quintile		
Quintile 1	0.2963	0.2799
Quintile 2	0.2446	0.2261
Quintile 3	0.2157	0.2513
Quintile 4	0.1651	0.1952
Quintile 5	0.0783	0.0475
Panel C: Fraction of Medium and High Skill Parents in each Income Quintile		
Quintile 1	0.0717	0.1253
Quintile 2	0.1334	0.1608
Quintile 3	0.1783	0.1616
Quintile 4	0.2482	0.1964
Quintile 5	0.3684	0.3761
Panel D: Fraction of Children Providing Child Labor by Parent Skill		
Low Skill Households	0.1233	0.2085
Medium Skill Households	0.0644	0.0393
High Skill Households	0.0403	0.0230
Panel E: Intergenerational Mobility of Education		
Low Skill Parents with Medium Skill Children	0.3341	0.2745
Low Skill Parents with High Skill Children	0.1871	0.0675
Medium Skill Parents with Low Skill Children	0.0899	0.5307
Medium Skill Parents with High Skill Children	0.5313	0.1515
High Skill Parents with Low Skill Children	0.0320	0.0338
High Skill Parents with Medium Skill Children	0.1194	0.5017

Notes: This table reports untargeted moments from the data and those from the model. Panel A presents the ratio between different percentiles of the labor income, where pX is the percentile X of the distribution. Panel B and C presents the fraction of households from low skill households and medium and high skill households, respectively, in each quintile of the labor income distribution. For the first three panels, labor income is represented by the hourly wage from the data and $w_\omega \times h_i$ in the model. Panel D presents the fraction of children providing some child labor, i.e., $\ell_{c,y} > 0$ depending on parental education. Panel E presents the Fraction of children from low, medium and high skill households who end up in sectors different from their parents.

Table 5: Economy Statistics

Variable	Value
GDP	4.056
Welfare	1.530
Low Skill Households	1.328
Medium Skill Households	1.613
High Skill Households	2.023
Average Human Capital	0.672
Low Skill Households	0.473
Medium Skill Households	0.691
High Skill Households	1.288
No Elementary School Wage Premium	0.178
High School Wage Premium	1.587
College Wage Premium	3.199
Labor Income Gini	0.716
Educational Attainment	
At Least Elementary School	0.946
At Least High School	0.481
At Least College	0.157
Child Labor	0.124
Low Skill Households	0.208
Medium Skill Households	0.039
High Skill Households	0.023
Government Spending	0.766
Transfers	0.560
Elementary School Per Pupil	0.302
High School Per Pupil	0.080
College Per Pupil	0.563

Notes: This table reports statistics for the baseline economy. GDP is calculated as total labor output plus returns from assets. Welfare is calculated as average welfare from old and young households. We also present welfare depending on parental education. Average human capital is calculated as young household's average human capital. We also present average human capital depending on parental education. No elementary school wage premium is the ratio between the average wage from low skill parents with no elementary school and low skill parents with elementary school, high school wage premium is the ratio between average wage from medium skill parents and low skill parents and college wage premium is the ratio between average wage from high skill parents and low skill parents. Child labor is the fraction of children providing some child labor, i.e., $\ell_{c,y} > 0$. We also present child labor depending on parental education. Government spending is total government spending, transfers is T from households and elementary school, high school and college expenditure per pupil are g_{es}, g_{hs} and g_{coll} respectively.

Table 6: Educational Attainment for Children below the 33^{th} Percentile of Innate Ability

Educational Attainment	Fraction of Children
At Least Elementary School	0.839
Low Skill Households	0.782
Medium Skill Households	0.884
High Skill Households	0.931
At Least High School	0.448
Low Skill Households	0.299
Medium Skill Households	0.452
High Skill Households	0.929
At Least College	0.012
Low Skill Households	0.000
Medium Skill Households	0.017
High Skill Households	0.039

Notes: This table reports the educational attainment for children with innate ability below the 33^{th} percentile for the baseline economy. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 7: Human Capital Distribution for Children below the 33^{th} Percentile of Innate Ability

Percentile of Human Capital	Fraction of Children
Percentile 0 to 5	0.161
Low Skill Households	0.218
Medium Skill Households	0.116
High Skill Households	0.069
Percentile 5 to 10	0.165
Low Skill Households	0.162
Medium Skill Households	0.181
High Skill Households	0.138
Percentile 10 to 25	0.283
Low Skill Households	0.318
Medium Skill Households	0.279
High Skill Households	0.175
Percentile 25 to 50	0.384
Low Skill Households	0.302
Medium Skill Households	0.417
High Skill Households	0.586
Percentile 50 to 100	0.007
Low Skill Households	0.000
Medium Skill Households	0.008
High Skill Households	0.032

Notes: This table reports the human capital accumulation for children with innate ability below the 33^{th} percentile for the baseline economy. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 8: Wage Distribution for Children below the 33^{th} Percentile of Innate Ability

Percentile of Wages	Fraction of Children
Percentile 0 to 5	0.161
Low Skill Households	0.218
Medium Skill Households	0.116
High Skill Households	0.069
Percentile 5 to 10	0.148
Low Skill Households	0.148
Medium Skill Households	0.164
High Skill Households	0.113
Percentile 10 to 25	0.461
Low Skill Households	0.503
Medium Skill Households	0.463
High Skill Households	0.319
Percentile 25 to 50	0.202
Low Skill Households	0.131
Medium Skill Households	0.227
High Skill Households	0.383
Percentile 50 to 100	0.028
Low Skill Households	0.000
Medium Skill Households	0.030
High Skill Households	0.115

Notes: This table reports the wage for children with innate ability below the 33^{th} percentile for the baseline economy. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 9: Educational Attainment for Children above the 66^{th} Percentile of Innate Ability

Educational Attainment	Fraction of Children
At Least Elementary School	1.000
Low Skill Households	1.000
Medium Skill Households	1.000
High Skill Households	1.000
At Least High School	0.552
Low Skill Households	0.423
Medium Skill Households	0.547
High Skill Households	0.989
At Least College	0.322
Low Skill Households	0.187
Medium Skill Households	0.280
High Skill Households	0.849

Notes: This table reports the educational attainment for children with innate ability above the 66^{th} percentile for the baseline economy. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 10: Human Capital Distribution for Children above the 66^{th} Percentile of Innate Ability

Percentile of Human Capital	Fraction of Children
Percentile 0 to 50	0.018
Low Skill Households	0.033
Medium Skill Households	0.002
High Skill Households	0.000
Percentile 50 to 75	0.388
Low Skill Households	0.495
Medium Skill Households	0.372
High Skill Households	0.069
Percentile 75 to 90	0.355
Low Skill Households	0.322
Medium Skill Households	0.369
High Skill Households	0.435
Percentile 90 to 95	0.140
Low Skill Households	0.111
Medium Skill Households	0.144
High Skill Households	0.224
Percentile 95 to 100	0.099
Low Skill Households	0.038
Medium Skill Households	0.113
High Skill Households	0.272

Notes: This table reports the human capital accumulation for children with innate ability above the 66^{th} percentile for the baseline economy. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 11: Wage Distribution for Children above the 66^{th} Percentile of Innate Ability

Percentile of Wages	Fraction of Children
Percentile 0 to 50	0.018
Low Skill Households	0.033
Medium Skill Households	0.002
High Skill Households	0.000
Percentile 50 to 75	0.345
Low Skill Households	0.449
Medium Skill Households	0.340
High Skill Households	0.008
Percentile 75 to 90	0.364
Low Skill Households	0.350
Medium Skill Households	0.370
High Skill Households	0.400
Percentile 90 to 95	0.159
Low Skill Households	0.125
Medium Skill Households	0.160
High Skill Households	0.271
Percentile 95 to 100	0.114
Low Skill Households	0.043
Medium Skill Households	0.127
High Skill Households	0.322

Notes: This table reports the wage for children with innate ability above the 66^{th} percentile for the baseline economy. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 12: Economy Statistics - Child Labor Ban and Compulsory Schooling

Variable	Baseline	Child Labor Ban	Compulsory Schooling
GDP	4.056	4.094	4.022
Welfare	1.530	1.548	1.520
Low Skill Households	1.328	1.370	1.346
Medium Skill Households	1.613	1.589	1.527
High Skill Households	2.023	2.020	1.995
Average Human Capital	0.672	0.679	0.666
Low Skill Households	0.473	0.496	0.492
Medium Skill Households	0.691	0.667	0.627
High Skill Households	1.288	1.273	1.238
No Elementary School Wage Premium	0.178	0.169	-
High School Wage Premium	1.587	1.460	1.385
College Wage Premium	3.199	3.011	2.969
Labor Income Gini	0.716	0.714	0.716
Educational Attainment			
At Least Elementary School	0.946	0.998	1.000
At Least High School	0.481	0.497	0.518
At Least College	0.157	0.162	0.171
Child Labor	0.124	0.002	0.000
Low Skill Households	0.208	0.001	0.000
Medium Skill Households	0.039	0.002	0.000
High Skill Households	0.023	0.000	0.000
Government Spending	0.766	0.774	0.761
Transfers	0.560	0.565	0.556
Elementary School Per Pupil	0.302	0.291	0.282
High School Per Pupil	0.080	0.077	0.074
College Per Pupil	0.563	0.543	0.526

Notes: This table reports statistics for the baseline economy, for when a child labor ban policy is in place and for when elementary school attendance is compulsory. GDP is calculated as total labor output plus returns from assets. Welfare is calculated as average welfare from old and young households. We also present welfare depending on parental education. Average human capital is calculated as young household's average human capital. We also present average human capital depending on parental education. No elementary school wage premium is the ratio between the average wage from low skill parents with no elementary school and low skill parents with elementary school, high school wage premium is the ratio between average wage from medium skill parents and low skill parents and college wage premium is the ratio between average wage from high skill parents and low skill parents. Child labor is the fraction of children providing some child labor, i.e., $\ell_{c,y} > 0$. We also present child labor depending on parental education. Government spending is total government spending, transfers is T from households and elementary school, high school and college expenditure per pupil are g_{es}, g_{hs} and g_{coll} respectively.

Table 13: Educational Attainment for Children below the 33^{th} Percentile of Innate Ability - Child Labor Ban and Compulsory Schooling

Educational Attainment	Baseline	Child Labor Ban	Compulsory Schooling
At Least Elementary School	0.839	0.995	1.000
Low Skill Households	0.782	0.996	1.000
Medium Skill Households	0.884	0.993	1.000
High Skill Households	0.931	1.000	1.000
At Least High School	0.448	0.506	0.547
Low Skill Households	0.299	0.380	0.438
Medium Skill Households	0.452	0.460	0.495
High Skill Households	0.929	0.994	0.958
At Least College	0.012	0.013	0.044
Low Skill Households	0.000	0.000	0.005
Medium Skill Households	0.017	0.018	0.028
High Skill Households	0.039	0.041	0.188

Notes: This table reports the educational attainment for children with innate ability below the 33^{th} percentile for the baseline economy, for when a child labor ban policy is in place and for when elementary school attendance is compulsory. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 14: Human Capital Distribution for Children below the 33^{th} Percentile of Innate Ability - Child Labor Ban and Compulsory Schooling

Percentile of Human Capital	Baseline	Child Labor Ban	Compulsory Schooling
Percentile 0 to 5	0.161	0.173	0.173
Low Skill Households	0.218	0.185	0.187
Medium Skill Households	0.116	0.181	0.183
High Skill Households	0.069	0.119	0.114
Percentile 5 to 10	0.165	0.135	0.149
Low Skill Households	0.162	0.151	0.168
Medium Skill Households	0.181	0.133	0.149
High Skill Households	0.138	0.090	0.095
Percentile 10 to 25	0.283	0.293	0.462
Low Skill Households	0.318	0.335	0.502
Medium Skill Households	0.279	0.286	0.456
High Skill Households	0.175	0.176	0.362
Percentile 25 to 50	0.384	0.392	0.207
Low Skill Households	0.302	0.329	0.143
Medium Skill Households	0.417	0.393	0.204
High Skill Households	0.586	0.585	0.396
Percentile 50 to 100	0.007	0.007	0.008
Low Skill Households	0.000	0.000	0.000
Medium Skill Households	0.008	0.007	0.008
High Skill Households	0.032	0.031	0.032

Notes: This table reports the human capital accumulation for children with innate ability below the 33^{th} percentile for the baseline economy, for when a child labor ban policy is in place and for when elementary school attendance is compulsory. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 15: Wage Distribution for Children below the 33^{th} Percentile of Innate Ability - Child Labor Ban and Compulsory Schooling

Percentile of Wages	Baseline	Child Labor Ban	Compulsory Schooling
Percentile 0 to 5	0.161	0.157	0.173
Low Skill Households	0.218	0.172	0.183
Medium Skill Households	0.116	0.165	0.175
High Skill Households	0.069	0.096	0.109
Percentile 5 to 10	0.148	0.151	0.152
Low Skill Households	0.148	0.165	0.172
Medium Skill Households	0.164	0.148	0.152
High Skill Households	0.113	0.113	0.096
Percentile 10 to 25	0.461	0.462	0.457
Low Skill Households	0.503	0.527	0.502
Medium Skill Households	0.463	0.444	0.460
High Skill Households	0.319	0.297	0.325
Percentile 25 to 50	0.202	0.219	0.200
Low Skill Households	0.131	0.137	0.143
Medium Skill Households	0.227	0.229	0.203
High Skill Households	0.383	0.451	0.355
Percentile 50 to 100	0.028	0.012	0.023
Low Skill Households	0.000	0.000	0.000
Medium Skill Households	0.030	0.013	0.009
High Skill Households	0.115	0.044	0.114

Notes: This table reports the wage for children with innate ability below the 33^{th} percentile for the baseline economy, for when a child labor ban policy is in place and for when elementary school attendance is compulsory. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 16: Educational Attainment for Children above the 66^{th} Percentile of Innate Ability - Child Labor Ban and Compulsory Schooling

Educational Attainment	Baseline	Child Labor Ban	Compulsory Schooling
At Least Elementary School	1.000	1.000	1.000
Low Skill Households	1.000	1.000	1.000
Medium Skill Households	1.000	1.000	1.000
High Skill Households	1.000	1.000	1.000
At Least High School	0.552	0.553	0.543
Low Skill Households	0.423	0.439	0.418
Medium Skill Households	0.547	0.516	0.520
High Skill Households	0.989	0.987	0.946
At Least College	0.322	0.321	0.333
Low Skill Households	0.187	0.191	0.193
Medium Skill Households	0.280	0.266	0.299
High Skill Households	0.849	0.842	0.796

Notes: This table reports the educational attainment for children with innate ability above the 66^{th} percentile for the baseline economy, for when a child labor ban policy is in place and for when elementary school attendance is compulsory. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 17: Human Capital Distribution for Children above the 66^{th} Percentile of Innate Ability - Child Labor Ban and Compulsory Schooling

Percentile of Human Capital	Baseline	Child Labor Ban	Compulsory Schooling
Percentile 0 to 50	0.018	0.007	0.015
Low Skill Households	0.033	0.007	0.014
Medium Skill Households	0.002	0.011	0.022
High Skill Households	0.000	0.000	0.002
Percentile 50 to 75	0.388	0.388	0.610
Low Skill Households	0.495	0.494	0.704
Medium Skill Households	0.372	0.382	0.613
High Skill Households	0.069	0.070	0.341
Percentile 75 to 90	0.355	0.363	0.127
Low Skill Households	0.322	0.339	0.110
Medium Skill Households	0.369	0.360	0.127
High Skill Households	0.435	0.442	0.173
Percentile 90 to 95	0.140	0.140	0.150
Low Skill Households	0.111	0.118	0.120
Medium Skill Households	0.144	0.136	0.143
High Skill Households	0.224	0.217	0.247
Percentile 95 to 100	0.099	0.102	0.098
Low Skill Households	0.038	0.042	0.052
Medium Skill Households	0.113	0.111	0.095
High Skill Households	0.272	0.271	0.237

Notes: This table reports the human capital accumulation for children with innate ability above the 66^{th} percentile for the baseline economy, for when a child labor ban policy is in place and for when elementary school attendance is compulsory. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 18: Wage Distribution for Children above the 66^{th} Percentile of Innate Ability - Child Labor Ban and Compulsory Schooling

Percentile of Wages	Baseline	Child Labor Ban	Compulsory Schooling
Percentile 0 to 50	0.018	0.007	0.015
Low Skill Households	0.033	0.007	0.014
Medium Skill Households	0.002	0.011	0.022
High Skill Households	0.000	0.000	0.002
Percentile 50 to 75	0.345	0.346	0.471
Low Skill Households	0.449	0.447	0.606
Medium Skill Households	0.340	0.354	0.486
High Skill Households	0.008	0.010	0.060
Percentile 75 to 90	0.364	0.370	0.266
Low Skill Households	0.350	0.367	0.208
Medium Skill Households	0.370	0.359	0.254
High Skill Households	0.400	0.402	0.455
Percentile 90 to 95	0.159	0.160	0.150
Low Skill Households	0.125	0.132	0.120
Medium Skill Households	0.160	0.150	0.143
High Skill Households	0.271	0.269	0.247
Percentile 95 to 100	0.114	0.117	0.098
Low Skill Households	0.043	0.046	0.052
Medium Skill Households	0.127	0.125	0.095
High Skill Households	0.322	0.317	0.237

Notes: This table reports the wage for children with innate ability above the 66^{th} percentile for the baseline economy, for when a child labor ban policy is in place and for when elementary school attendance is compulsory. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 19: Economy Statistics - Basic vs. Higher Education Spending

Variable	Baseline	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$	α =1.0
GDP	4.056	4.042	4.071	4.087	4.084	4.098	4.109	4.122	4.133	4.144
Welfare	1.530	1.529	1.539	1.546	1.547	1.550	1.554	1.557	1.561	1.563
Low Skill Households	1.328	1.312	1.324	1.336	1.333	1.338	1.343	1.345	1.351	1.356
Medium Skill Households	1.613	1.630	1.643	1.683	1.682	1.729	1.752	1.787	1.809	1.834
High Skill Households	2.023	2.052	1.987	1.938	1.887	1.848	1.824	1.796	1.790	1.775
Average Human Capital	0.672	0.669	0.674	0.677	0.677	0.679	0.681	0.683	0.685	0.687
Low Skill Households	0.473	0.452	0.458	0.460	0.460	0.459	0.461	0.461	0.462	0.465
Medium Skill Households	0.691	0.685	0.747	0.832	0.863	0.959	1.001	1.064	1.097	1.142
High Skill Households	1.288	1.370	1.180	1.066	0.960	0.893	0.852	0.817	0.806	0.787
No Elementary School Wage Premium	0.178	0.186	0.184	0.183	0.183	0.183	0.182	0.182	0.182	0.181
High School Wage Premium	1.587	1.645	1.769	1.960	2.032	2.262	2.352	2.498	2.569	2.658
College Wage Premium	3.199	3.544	3.051	2.764	2.504	2.344	2.232	2.145	2.115	2.058
Labor Income Gini	0.716	0.718	0.716	0.715	0.714	0.714	0.713	0.713	0.712	0.712
Educational Attainment										
At Least Elementary School	0.946	0.943	0.947	0.951	0.951	0.953	0.955	0.956	0.957	0.958
At Least High School	0.481	0.478	0.483	0.463	0.485	0.471	0.474	0.474	0.468	0.467
At Least College	0.157	0.154	0.177	0.193	0.217	0.234	0.239	0.256	0.254	0.263
Child Labor	0.124	0.115	0.122	0.115	0.115	0.112	0.108	0.107	0.102	0.100
Low Skill Households	0.208	0.189	0.207	0.191	0.196	0.189	0.184	0.182	0.172	0.169
Medium Skill Households	0.039	0.040	0.036	0.032	0.032	0.028	0.025	0.024	0.023	0.020
High Skill Households	0.023	0.024	0.024	0.022	0.023	0.022	0.022	0.022	0.021	0.021
Government Spending	0.766	0.764	0.769	0.771	0.770	0.773	0.775	0.777	0.779	0.781
Transfers	0.560	0.558	0.562	0.564	0.563	0.565	0.566	0.568	0.569	0.571
Elementary School Per Pupil	0.302	0.285	0.302	0.315	0.318	0.324	0.330	0.333	0.339	0.342
High School Per Pupil	0.080	0.095	0.101	0.105	0.106	0.108	0.110	0.111	0.113	0.114
College Per Pupil	0.563	0.633	0.448	0.350	0.282	0.240	0.209	0.185	0.167	0.152

Notes: This table reports statistics for the baseline economy and for when we change relative educational spending between basic and higher education. GDP is calculated as total labor output plus returns from assets. Welfare is calculated as average welfare from old and young households. We also present welfare depending on parental education. Average human capital is calculated as young household's average human capital. We also present average human capital depending on parental education. No elementary school wage premium is the ratio between the average wage from low skill parents with no elementary school and low skill parents with elementary school, high school wage premium is the ratio between average wage from medium skill parents and low skill parents and college wage premium is the ratio between average wage from high skill parents and low skill parents. Child labor is the fraction of children providing some child labor, i.e., $\ell_{c,y} > 0$. We also present child labor depending on parental education. Government spending is total government spending, transfers is T from households and elementary school, high school and college expenditure per pupil are g_{es}, g_{hs} and g_{coll} respectively.

Table 20: Educational Attainment for Children below the 33^{th} Percentile of Innate Ability - Basic vs. Higher Education Spending

Educational Attainment	Baseline	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$	α =1.0
At Least Elementary School	0.839	0.829	0.842	0.852	0.855	0.860	0.866	0.868	0.871	0.873
Low Skill Households	0.782	0.768	0.783	0.796	0.797	0.802	0.808	0.810	0.815	0.816
Medium Skill Households	0.884	0.881	0.891	0.905	0.904	0.916	0.926	0.930	0.932	0.942
High Skill Households	0.931	0.928	0.928	0.936	0.931	0.934	0.935	0.934	0.936	0.937
At Least High School	0.448	0.403	0.409	0.374	0.403	0.374	0.375	0.373	0.368	0.371
Low Skill Households	0.299	0.230	0.239	0.194	0.226	0.180	0.182	0.172	0.171	0.173
Medium Skill Households	0.452	0.434	0.423	0.432	0.458	0.512	0.555	0.608	0.620	0.664
High Skill Households	0.929	0.924	0.883	0.794	0.753	0.670	0.620	0.585	0.567	0.545
At Least College	0.012	0.009	0.041	0.084	0.135	0.182	0.216	0.259	0.271	0.296
Low Skill Households	0.000	0.000	0.001	0.004	0.012	0.034	0.051	0.084	0.092	0.110
Medium Skill Households	0.017	0.006	0.064	0.150	0.233	0.344	0.414	0.483	0.524	0.590
High Skill Households	0.039	0.043	0.119	0.214	0.305	0.353	0.383	0.429	0.433	0.445

Notes: This table reports the educational attainment for children with innate ability below the 33^{th} percentile for the baseline economy and for when we change relative educational spending between basic and higher education. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 21: Human Capital Distribution for Children below the 33^{th} Percentile of Innate Ability - Basic vs. Higher Education Spending

Percentile of Human Capital	Baseline	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$	α =1.0
Percentile 0 to 5	0.161	0.171	0.158	0.151	0.171	0.168	0.164	0.163	0.160	0.159
Low Skill Households	0.218	0.232	0.217	0.204	0.215	0.210	0.205	0.203	0.199	0.197
Medium Skill Households	0.116	0.119	0.109	0.101	0.135	0.127	0.122	0.119	0.115	0.112
High Skill Households	0.069	0.072	0.072	0.074	0.112	0.115	0.116	0.117	0.116	0.117
Percentile 5 to 10	0.165	0.162	0.165	0.163	0.142	0.139	0.139	0.138	0.241	0.240
Low Skill Households	0.162	0.159	0.161	0.158	0.147	0.143	0.142	0.141	0.256	0.253
Medium Skill Households	0.181	0.183	0.183	0.180	0.144	0.139	0.137	0.133	0.220	0.220
High Skill Households	0.138	0.125	0.145	0.152	0.126	0.131	0.133	0.135	0.227	0.231
Percentile 10 to 25	0.283	0.287	0.283	0.279	0.281	0.442	0.440	0.438	0.331	0.328
Low Skill Households	0.318	0.324	0.321	0.313	0.311	0.483	0.479	0.477	0.358	0.357
Medium Skill Households	0.279	0.279	0.275	0.266	0.272	0.429	0.420	0.408	0.310	0.296
High Skill Households	0.175	0.177	0.189	0.205	0.218	0.362	0.372	0.384	0.294	0.295
Percentile 25 to 50	0.384	0.374	0.385	0.398	0.398	0.243	0.250	0.254	0.261	0.265
Low Skill Households	0.302	0.286	0.301	0.325	0.326	0.164	0.174	0.179	0.188	0.194
Medium Skill Households	0.417	0.413	0.424	0.440	0.437	0.294	0.309	0.329	0.343	0.359
High Skill Households	0.586	0.589	0.564	0.541	0.520	0.370	0.359	0.345	0.344	0.338
Percentile 50 to 100	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.007
Low Skill Households	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Medium Skill Households	0.008	0.006	0.010	0.012	0.012	0.012	0.012	0.012	0.012	0.012
High Skill Households	0.032	0.036	0.030	0.027	0.024	0.022	0.020	0.019	0.019	0.019

Notes: This table reports the human capital accumulation for children with innate ability below the 33^{th} percentile for the baseline economy and for when we change relative educational spending between basic and higher education. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 22: Wage Distribution for Children below the 33^{th} Percentile of Innate Ability - Basic vs. Higher Education Spending

Percentile of Wages	Baseline	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$	α =1.0
Percentile 0 to 5	0.161	0.171	0.158	0.150	0.155	0.150	0.154	0.152	0.153	0.163
Low Skill Households	0.218	0.232	0.217	0.204	0.208	0.204	0.201	0.200	0.199	0.200
Medium Skill Households	0.116	0.119	0.109	0.099	0.113	0.101	0.105	0.099	0.099	0.117
High Skill Households	0.069	0.072	0.072	0.071	0.079	0.080	0.097	0.097	0.103	0.124
Percentile 5 to 10	0.148	0.146	0.147	0.150	0.155	0.152	0.209	0.210	0.204	0.191
Low Skill Households	0.148	0.147	0.148	0.147	0.154	0.148	0.231	0.233	0.228	0.220
Medium Skill Households	0.164	0.165	0.165	0.168	0.160	0.155	0.192	0.180	0.172	0.146
High Skill Households	0.113	0.102	0.111	0.132	0.151	0.156	0.178	0.187	0.183	0.168
Percentile 10 to 25	0.461	0.404	0.459	0.449	0.433	0.426	0.390	0.379	0.377	0.372
Low Skill Households	0.503	0.472	0.501	0.498	0.483	0.482	0.436	0.414	0.412	0.413
Medium Skill Households	0.463	0.391	0.457	0.429	0.419	0.397	0.360	0.349	0.340	0.317
High Skill Households	0.319	0.200	0.338	0.341	0.333	0.330	0.321	0.334	0.335	0.330
Percentile 25 to 50	0.202	0.252	0.221	0.232	0.236	0.252	0.226	0.238	0.244	0.251
Low Skill Households	0.131	0.150	0.133	0.150	0.154	0.166	0.132	0.153	0.161	0.166
Medium Skill Households	0.227	0.301	0.248	0.272	0.271	0.312	0.306	0.331	0.347	0.376
High Skill Households	0.383	0.495	0.429	0.404	0.385	0.384	0.354	0.334	0.330	0.327
Percentile 50 to 100	0.028	0.028	0.016	0.019	0.021	0.020	0.021	0.021	0.022	0.022
Low Skill Households	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Medium Skill Households	0.030	0.024	0.021	0.032	0.037	0.035	0.037	0.040	0.042	0.045
High Skill Households	0.115	0.130	0.051	0.053	0.052	0.051	0.050	0.048	0.050	0.051

Notes: This table reports the wage for children with innate ability below the 33^{th} percentile for the baseline economy and for when we change relative educational spending between basic and higher education. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 23: Educational Attainment for Children above the 66^{th} Percentile of Innate Ability - Basic vs. Higher Education Spending

Educational Attainment	Baseline	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$	α =1.0
At Least Elementary School	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Low Skill Households	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Medium Skill Households	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
High Skill Households	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
At Least High School	0.552	0.578	0.586	0.582	0.596	0.601	0.604	0.607	0.609	0.611
Low Skill Households	0.423	0.432	0.443	0.433	0.451	0.452	0.457	0.458	0.461	0.466
Medium Skill Households	0.547	0.616	0.609	0.642	0.649	0.707	0.737	0.782	0.812	0.839
High Skill Households	0.989	0.995	0.964	0.915	0.875	0.830	0.798	0.764	0.749	0.731
At Least College	0.322	0.338	0.314	0.293	0.278	0.264	0.244	0.238	0.222	0.217
Low Skill Households	0.187	0.176	0.152	0.130	0.123	0.104	0.095	0.094	0.064	0.061
Medium Skill Households	0.280	0.331	0.318	0.357	0.367	0.422	0.435	0.460	0.483	0.512
High Skill Households	0.849	0.900	0.780	0.654	0.536	0.466	0.387	0.344	0.333	0.305

Notes: This table reports the educational attainment for children with innate ability above the 66^{th} percentile for the baseline economy and for when we change relative educational spending between basic and higher education. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 24: Human Capital Distribution for Children above the 66^{th} Percentile of Innate Ability - Basic vs. Higher Education Spending

Percentile of Human Capital	Baseline	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$	α =1.0
Percentile 0 to 50	0.018	0.020	0.017	0.015	0.015	0.014	0.013	0.013	0.013	0.012
Low Skill Households	0.033	0.036	0.032	0.027	0.027	0.025	0.024	0.024	0.023	0.022
Medium Skill Households	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.000	0.000
High Skill Households	0.000	0.000	0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.002
Percentile 50 to 75	0.388	0.395	0.389	0.391	0.397	0.395	0.395	0.394	0.389	0.385
Low Skill Households	0.495	0.516	0.503	0.505	0.510	0.506	0.502	0.500	0.494	0.490
Medium Skill Households	0.372	0.361	0.362	0.344	0.350	0.315	0.304	0.283	0.264	0.244
High Skill Households	0.069	0.054	0.099	0.140	0.188	0.224	0.248	0.270	0.274	0.280
Percentile 75 to 90	0.355	0.342	0.299	0.301	0.292	0.349	0.349	0.347	0.350	0.353
Low Skill Households	0.322	0.307	0.275	0.274	0.270	0.317	0.319	0.320	0.324	0.327
Medium Skill Households	0.369	0.368	0.307	0.311	0.290	0.369	0.373	0.375	0.382	0.386
High Skill Households	0.435	0.403	0.355	0.363	0.344	0.399	0.390	0.380	0.380	0.379
Percentile 90 to 95	0.140	0.143	0.194	0.189	0.193	0.137	0.136	0.137	0.138	0.139
Low Skill Households	0.111	0.104	0.151	0.149	0.148	0.104	0.105	0.106	0.108	0.108
Medium Skill Households	0.144	0.154	0.210	0.211	0.225	0.163	0.163	0.172	0.175	0.181
High Skill Households	0.224	0.253	0.291	0.267	0.261	0.183	0.176	0.174	0.171	0.168
Percentile 95 to 100	0.099	0.101	0.102	0.104	0.104	0.106	0.107	0.108	0.109	0.111
Low Skill Households	0.038	0.037	0.040	0.044	0.045	0.047	0.049	0.051	0.051	0.053
Medium Skill Households	0.113	0.114	0.119	0.133	0.134	0.152	0.160	0.170	0.178	0.189
High Skill Households	0.272	0.290	0.254	0.229	0.206	0.192	0.184	0.174	0.173	0.169

Notes: This table reports the human capital accumulation for children with innate ability above the 66^{th} percentile for the baseline economy and for when we change relative educational spending between basic and higher education. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 25: Wage Distribution for Children above the 66^{th} Percentile of Innate Ability - Basic vs. Higher Education Spending

Percentile of Wages	Baseline	$\alpha = 0.2$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$	α =1.0
Percentile 0 to 50	0.018	0.019	0.017	0.015	0.015	0.014	0.013	0.013	0.013	0.012
Low Skill Households	0.033	0.036	0.032	0.027	0.027	0.025	0.024	0.024	0.023	0.022
Medium Skill Households	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.000	0.000
High Skill Households	0.000	0.000	0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.002
Percentile 50 to 75	0.345	0.345	0.329	0.325	0.331	0.327	0.324	0.324	0.323	0.322
Low Skill Households	0.449	0.468	0.447	0.435	0.437	0.434	0.428	0.426	0.433	0.428
Medium Skill Households	0.340	0.308	0.304	0.283	0.280	0.240	0.226	0.198	0.177	0.155
High Skill Households	0.008	0.007	0.024	0.056	0.090	0.123	0.151	0.178	0.188	0.203
Percentile 75 to 90	0.364	0.357	0.358	0.368	0.358	0.395	0.398	0.397	0.397	0.398
Low Skill Households	0.350	0.338	0.330	0.338	0.327	0.371	0.374	0.375	0.375	0.378
Medium Skill Households	0.370	0.387	0.365	0.370	0.351	0.391	0.402	0.404	0.410	0.414
High Skill Households	0.400	0.357	0.430	0.447	0.439	0.455	0.446	0.437	0.431	0.425
Percentile 90 to 95	0.159	0.159	0.179	0.177	0.183	0.149	0.147	0.146	0.147	0.146
Low Skill Households	0.125	0.112	0.149	0.147	0.147	0.107	0.108	0.108	0.111	0.110
Medium Skill Households	0.160	0.173	0.191	0.194	0.207	0.186	0.185	0.190	0.194	0.198
High Skill Households	0.271	0.288	0.245	0.236	0.241	0.208	0.196	0.187	0.183	0.177
Percentile 95 to 100	0.114	0.119	0.117	0.115	0.113	0.115	0.117	0.119	0.120	0.122
Low Skill Households	0.043	0.045	0.042	0.046	0.046	0.048	0.050	0.052	0.052	0.054
Medium Skill Households	0.127	0.130	0.137	0.149	0.151	0.171	0.182	0.197	0.206	0.218
High Skill Households	0.322	0.349	0.301	0.259	0.227	0.209	0.201	0.192	0.191	0.186

Notes: This table reports the wage for children with innate ability above the 66^{th} percentile for the baseline economy and for when we change relative educational spending between basic and higher education. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 26: Economy Statistics - Government Expenditure in Education

Educational Attainment	G/(τ*Y) = 0.1	G/(τ*Y) = 0.2	G/(τ*Y) = 0.269 Baseline	G/(τ*Y) = 0.3	G/(τ*Y) = 0.4	G/(τ*Y) = 0.5
GDP	3.525	3.766	4.056	4.216	4.735	5.313
Welfare	1.369	1.446	1.530	1.572	1.674	1.763
Low Skill Households	1.138	1.257	1.328	1.370	1.466	1.557
Medium Skill Households	1.465	1.466	1.613	1.655	1.822	1.981
High Skill Households	1.811	1.928	2.023	2.064	2.161	2.257
Average Human Capital	0.581	0.623	0.672	0.698	0.784	0.880
Low Skill Households	0.410	0.467	0.473	0.483	0.495	0.508
Medium Skill Households	0.681	0.610	0.691	0.703	0.881	1.113
High Skill Households	0.868	1.076	1.288	1.390	1.684	2.072
No Elementary School Wage Premium	0.205	0.180	0.178	0.174	0.170	0.165
High School Wage Premium	1.819	1.423	1.587	1.580	1.916	2.332
College Wage Premium	2.586	2.748	3.199	3.363	3.885	4.531
Labor Income Gini	0.731	0.720	0.716	0.715	0.711	0.708
Educational Attainment						
At Least Elementary School	0.842	0.914	0.946	0.958	0.984	0.993
At Least High School	0.493	0.515	0.481	0.482	0.445	0.397
At Least College	0.202	0.176	0.157	0.159	0.146	0.137
Child Labor	0.259	0.181	0.124	0.100	0.052	0.036
Low Skill Households	0.387	0.285	0.208	0.174	0.092	0.060
Medium Skill Households	0.170	0.103	0.039	0.028	0.004	0.000
High Skill Households	0.069	0.044	0.023	0.007	0.000	0.000
Government Spending	0.666	0.711	0.766	0.797	0.896	1.007
Transfers	0.599	0.569	0.560	0.558	0.538	0.504
Elementary School Per Pupil	0.099	0.206	0.302	0.346	0.522	0.745
High School Per Pupil	0.026	0.054	0.080	0.091	0.138	0.196
College Per Pupil	0.184	0.385	0.563	0.646	0.974	1.390

Notes: This table reports statistics for the baseline economy and for when we the fraction of total government expenditures spent in education relative to transfers. GDP is calculated as total labor output plus returns from assets. Welfare is calculated as average welfare from old and young households. We also present welfare depending on parental education. Average human capital is calculated as young household's average human capital. We also present average human capital depending on parental education. No elementary school wage premium is the ratio between the average wage from low skill parents with no elementary school and low skill parents with elementary school, high school wage premium is the ratio between average wage from medium skill parents and low skill parents and college wage premium is the ratio between average wage from high skill parents and low skill parents. Child labor is the fraction of children providing some child labor, i.e., $\ell_{c,y} > 0$. We also present child labor depending on parental education. Government spending is total government spending, transfers is T from households and elementary school, high school and college expenditure per pupil are g_{es}, g_{hs} and g_{coll} respectively.

Table 27: Educational Attainment for Children below the 33^{th} Percentile of Innate Ability - Government Expenditure in Education

Percentile of Human Capital	G/(τ*Y) = 0.1	G/(τ*Y) = 0.2	G/(τ*Y) = 0.269 Baseline	G/(τ*Y) = 0.3	G/(τ*Y) = 0.4	G/(τ*Y) = 0.5
At Least Elementary School	0.527	0.743	0.839	0.875	0.951	0.978
Low Skill Households	0.382	0.669	0.782	0.817	0.919	0.963
Medium Skill Households	0.596	0.782	0.884	0.916	0.988	0.999
High Skill Households	0.793	0.868	0.931	0.981	1.000	1.000
At Least High School	0.477	0.568	0.448	0.427	0.269	0.097
Low Skill Households	0.318	0.480	0.299	0.271	0.064	0.001
Medium Skill Households	0.544	0.540	0.452	0.409	0.353	0.110
High Skill Households	0.779	0.863	0.929	0.970	0.876	0.491
At Least College	0.141	0.047	0.012	0.007	0.001	0.000
Low Skill Households	0.033	0.000	0.000	0.000	0.000	0.000
Medium Skill Households	0.208	0.074	0.017	0.005	0.000	0.000
High Skill Households	0.317	0.125	0.039	0.035	0.007	0.000

Notes: This table reports the educational attainment for children with innate ability below the 33^{th} percentile for the baseline economy and for when we the fraction of total government expenditures spent in education relative to transfers. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 28: Human Capital Distribution for Children below the 33^{th} Percentile of Innate Ability - Government Expenditure in Education

Percentile of Wages	G/(τ*Y) = 0.1	G/(τ*Y) = 0.2	G/(τ*Y) = 0.269 Baseline	G/(τ*Y) = 0.3	G/(τ*Y) = 0.4	G/(τ*Y) = 0.5
Percentile 0 to 5	0.473	0.257	0.161	0.156	0.167	0.201
Low Skill Households	0.618	0.331	0.218	0.195	0.189	0.232
Medium Skill Households	0.404	0.218	0.116	0.128	0.153	0.163
High Skill Households	0.207	0.132	0.069	0.082	0.115	0.140
Percentile 5 to 10	0.000	0.131	0.165	0.235	0.187	0.116
Low Skill Households	0.000	0.152	0.162	0.248	0.202	0.128
Medium Skill Households	0.000	0.132	0.181	0.243	0.183	0.106
High Skill Households	0.000	0.068	0.138	0.179	0.138	0.082
Percentile 10 to 25	0.142	0.240	0.283	0.323	0.280	0.356
Low Skill Households	0.142	0.259	0.318	0.352	0.302	0.378
Medium Skill Households	0.138	0.254	0.279	0.329	0.275	0.337
High Skill Households	0.146	0.160	0.175	0.218	0.209	0.290
Percentile 25 to 50	0.367	0.366	0.384	0.278	0.365	0.327
Low Skill Households	0.240	0.258	0.302	0.205	0.308	0.262
Medium Skill Households	0.433	0.391	0.417	0.294	0.389	0.394
High Skill Households	0.590	0.617	0.586	0.484	0.536	0.483
Percentile 50 to 100	0.019	0.006	0.007	0.008	0.000	0.001
Low Skill Households	0.000	0.000	0.000	0.000	0.000	0.000
Medium Skill Households	0.025	0.006	0.008	0.007	0.000	0.000
High Skill Households	0.057	0.023	0.032	0.037	0.001	0.004

Notes: This table reports the human capital accumulation for children with innate ability below the 33^{th} percentile for the baseline economy and for when we the fraction of total government expenditures spent in education relative to transfers. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 29: Wage Distribution for Children below the 33^{th} Percentile of Innate Ability - Government Expenditure in Education

Variable	G/(τ*Y) = 0.1	G/(τ*Y) = 0.2	G/(τ*Y) = 0.269 Baseline	G/(τ*Y) = 0.3	G/(τ*Y) = 0.4	G/(τ*Y) = 0.5
Percentile 0 to 5	0.241	0.464	0.186	0.153	0.188	0.179
Low Skill Households	0.302	0.557	0.237	0.180	0.226	0.221
Medium Skill Households	0.177	0.403	0.124	0.105	0.123	0.099
High Skill Households	0.132	0.279	0.095	0.099	0.110	0.084
Percentile 5 to 10	0.096	0.000	0.121	0.193	0.146	0.243
Low Skill Households	0.079	0.000	0.107	0.207	0.161	0.275
Medium Skill Households	0.112	0.000	0.140	0.168	0.119	0.184
High Skill Households	0.128	0.000	0.139	0.162	0.113	0.172
Percentile 10 to 25	0.432	0.246	0.431	0.453	0.542	0.329
Low Skill Households	0.458	0.267	0.433	0.462	0.550	0.339
Medium Skill Households	0.452	0.255	0.447	0.444	0.538	0.317
High Skill Households	0.278	0.158	0.388	0.421	0.502	0.287
Percentile 25 to 50	0.229	0.278	0.259	0.201	0.124	0.250
Low Skill Households	0.160	0.176	0.222	0.150	0.063	0.165
Medium Skill Households	0.258	0.330	0.288	0.283	0.219	0.399
High Skill Households	0.449	0.507	0.355	0.318	0.276	0.457

Notes: This table reports the wage for children with innate ability below the 33^{th} percentile for the baseline economy and for when we the fraction of total government expenditures spent in education relative to transfers. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 30: Educational Attainment for Children above the 66^{th} Percentile of Innate Ability - Government Expenditure in Education

Educational Attainment	G/(τ*Y) = 0.1	G/(τ*Y) = 0.2	G/(τ*Y) = 0.269 Baseline	G/(τ*Y) = 0.3	G/(τ*Y) = 0.4	G/(τ*Y) = 0.5
At Least Elementary School	1.000	1.000	1.000	1.000	1.000	1.000
Low Skill Households	1.000	1.000	1.000	1.000	1.000	1.000
Medium Skill Households	1.000	1.000	1.000	1.000	1.000	1.000
High Skill Households	1.000	1.000	1.000	1.000	1.000	1.000
At Least High School	0.450	0.485	0.552	0.587	0.685	0.768
Low Skill Households	0.318	0.373	0.423	0.466	0.547	0.636
Medium Skill Households	0.437	0.406	0.547	0.581	0.789	0.951
High Skill Households	0.800	0.946	0.989	0.996	1.000	1.000
At Least College	0.210	0.288	0.322	0.345	0.352	0.370
Low Skill Households	0.099	0.200	0.187	0.189	0.130	0.130
Medium Skill Households	0.258	0.205	0.280	0.322	0.463	0.613
High Skill Households	0.419	0.689	0.849	0.904	0.967	0.969

Notes: This table reports the educational attainment for children with innate ability above the 66^{th} percentile for the baseline economy and for when we the fraction of total government expenditures spent in education relative to transfers. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 31: Human Capital Distribution for Children above the 66^{th} Percentile of Innate Ability - Government Expenditure in Education

Percentile of Human Capital	G/(τ*Y) = 0.1	G/(τ*Y) = 0.2	G/(τ*Y) = 0.269 Baseline	G/(τ*Y) = 0.3	G/(τ*Y) = 0.4	G/(τ*Y) = 0.5
Percentile 0 to 50	0.082	0.060	0.018	0.012	0.019	0.009
Low Skill Households	0.146	0.097	0.033	0.023	0.028	0.014
Medium Skill Households	0.026	0.039	0.002	0.002	0.010	0.001
High Skill Households	0.000	0.000	0.000	0.000	0.000	0.000
Percentile 50 to 75	0.254	0.297	0.388	0.359	0.359	0.355
Low Skill Households	0.327	0.376	0.495	0.466	0.480	0.461
Medium Skill Households	0.257	0.318	0.372	0.344	0.299	0.262
High Skill Households	0.066	0.036	0.069	0.039	0.021	0.061
Percentile 75 to 90	0.445	0.402	0.355	0.360	0.369	0.377
Low Skill Households	0.408	0.380	0.322	0.337	0.310	0.346
Medium Skill Households	0.460	0.394	0.369	0.374	0.413	0.420
High Skill Households	0.518	0.479	0.435	0.407	0.502	0.428
Percentile 90 to 95	0.090	0.112	0.140	0.152	0.122	0.134
Low Skill Households	0.055	0.082	0.111	0.117	0.098	0.098
Medium Skill Households	0.102	0.116	0.144	0.155	0.132	0.159
High Skill Households	0.161	0.186	0.224	0.256	0.197	0.242
Percentile 95 to 100	0.129	0.129	0.099	0.118	0.131	0.126
Low Skill Households	0.064	0.065	0.038	0.058	0.083	0.081
Medium Skill Households	0.155	0.133	0.113	0.125	0.145	0.158
High Skill Households	0.255	0.300	0.272	0.298	0.280	0.268

Notes: This table reports the human capital accumulation for children with innate ability above the 66^{th} percentile for the baseline economy and for when we the fraction of total government expenditures spent in education relative to transfers. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 32: Wage Distribution for Children above the 66^{th} Percentile of Innate Ability - Government Expenditure in Education

Percentile of Wages	G/(τ*Y) = 0.1	G/(τ*Y) = 0.2	G/(τ*Y) = 0.269 Baseline	G/(τ*Y) = 0.3	G/(τ*Y) = 0.4	G/(τ*Y) = 0.5
Percentile 0 to 50	0.082	0.060	0.018	0.012	0.019	0.009
Low Skill Households	0.146	0.096	0.033	0.023	0.028	0.014
Medium Skill Households	0.026	0.038	0.002	0.002	0.010	0.001
High Skill Households	0.000	0.000	0.000	0.000	0.000	0.000
Percentile 50 to 75	0.310	0.368	0.345	0.315	0.330	0.287
Low Skill Households	0.376	0.432	0.449	0.416	0.450	0.410
Medium Skill Households	0.333	0.423	0.340	0.308	0.261	0.144
High Skill Households	0.091	0.037	0.008	0.003	0.015	0.014
Percentile 75 to 90	0.361	0.286	0.364	0.403	0.398	0.414
Low Skill Households	0.345	0.284	0.350	0.387	0.340	0.389
Medium Skill Households	0.343	0.258	0.370	0.410	0.451	0.489
High Skill Households	0.428	0.346	0.400	0.443	0.508	0.387
Percentile 90 to 95	0.118	0.157	0.159	0.131	0.122	0.164
Low Skill Households	0.063	0.107	0.125	0.107	0.098	0.107
Medium Skill Households	0.142	0.147	0.160	0.140	0.132	0.209
High Skill Households	0.223	0.310	0.271	0.192	0.197	0.330
Percentile 95 to 100	0.129	0.129	0.114	0.138	0.131	0.126
Low Skill Households	0.064	0.065	0.043	0.068	0.083	0.081
Medium Skill Households	0.155	0.133	0.127	0.140	0.145	0.158
High Skill Households	0.255	0.300	0.322	0.361	0.280	0.268

Notes: This table reports the wage for children with innate ability above the 66^{th} percentile for the baseline economy and for when we the fraction of total government expenditures spent in education relative to transfers. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 33: Economy Statistics - Taxation

Variable	$\tau = 0.1$	$\tau = 0.182$ (Baseline)	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
GDP	3.862	4.056	4.122	4.804	5.543	6.210
Welfare	1.411	1.530	1.557	1.738	1.872	1.966
Low Skill Households	1.165	1.328	1.363	1.572	1.733	1.854
Medium Skill Households	1.495	1.613	1.613	1.851	2.014	2.088
High Skill Households	1.934	2.023	2.042	2.182	2.258	2.297
Average Human Capital	0.636	0.672	0.683	0.800	0.926	1.041
Low Skill Households	0.450	0.473	0.483	0.499	0.521	0.572
Medium Skill Households	0.704	0.691	0.663	0.856	1.160	1.356
High Skill Households	1.021	1.288	1.354	1.949	2.446	2.867
No Elementary School Wage Premium	0.187	0.178	0.174	0.168	0.161	0.147
High School Wage Premium	1.707	1.587	1.489	1.843	2.354	2.459
College Wage Premium	2.725	3.199	3.282	4.392	5.058	5.188
Labor Income Gini	0.724	0.716	0.715	0.708	0.703	0.700
Educational Attainment						
At Least Elementary School	0.902	0.946	0.953	0.984	0.992	0.994
At Least High School	0.494	0.481	0.507	0.441	0.389	0.373
At Least College	0.190	0.157	0.157	0.131	0.122	0.117
Child Labor	0.199	0.124	0.110	0.030	0.012	0.007
Low Skill Households	0.315	0.208	0.195	0.052	0.020	0.011
Medium Skill Households	0.104	0.039	0.035	0.002	0.000	0.000
High Skill Households	0.045	0.023	0.012	0.000	0.000	0.000
Government Spending	0.404	0.766	0.854	1.482	2.263	3.146
Transfers	0.296	0.560	0.624	1.083	1.654	2.299
Elementary School Per Pupil	0.157	0.302	0.333	0.594	0.922	1.292
High School Per Pupil	0.041	0.080	0.088	0.156	0.243	0.340
College Per Pupil	0.293	0.563	0.622	1.108	1.720	2.410

Notes: This table reports statistics for the baseline economy and for when we vary the taxation in the economy. GDP is calculated as total labor output plus returns from assets. Welfare is calculated as average welfare from old and young households. We also present welfare depending on parental education. Average human capital is calculated as young household's average human capital. We also present average human capital depending on parental education. No elementary school wage premium is the ratio between the average wage from low skill parents with no elementary school and low skill parents with elementary school, high school wage premium is the ratio between average wage from medium skill parents and low skill parents and college wage premium is the ratio between average wage from high skill parents and low skill parents. Child labor is the fraction of children providing some child labor, i.e., $\ell_{c,y} > 0$. We also present child labor depending on parental education. Government spending is total government spending, transfers is T from households and elementary school, high school and college expenditure per pupil are g_{es}, g_{hs} and g_{coll} respectively.

Table 34: Educational Attainment for Children below the 33^{th} Percentile of Innate Ability - Taxation

Educational Attainment	$\tau = 0.1$	$\tau = 0.182$ (Baseline)	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
At Least Elementary School	0.705	0.839	0.859	0.951	0.975	0.983
Low Skill Households	0.608	0.782	0.798	0.916	0.959	0.972
Medium Skill Households	0.767	0.884	0.897	0.993	1.000	1.000
High Skill Households	0.866	0.931	0.964	1.000	1.000	1.000
At Least High School	0.566	0.448	0.475	0.215	0.037	0.002
Low Skill Households	0.461	0.299	0.328	0.032	0.000	0.000
Medium Skill Households	0.564	0.452	0.465	0.249	0.008	0.000
High Skill Households	0.851	0.929	0.962	0.917	0.282	0.021
At Least College	0.079	0.012	0.007	0.000	0.000	0.000
Low Skill Households	0.005	0.000	0.000	0.000	0.000	0.000
Medium Skill Households	0.129	0.017	0.008	0.000	0.000	0.000
High Skill Households	0.194	0.039	0.029	0.000	0.000	0.000

Notes: This table reports the educational attainment for children with innate ability below the 33^{th} percentile for the baseline economy and for when we vary the taxation in the economy. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 35: Human Capital Distribution for Children below the 33^{th} Percentile of Innate Ability - Taxation

Percentile of Human Capital	$\tau = 0.1$	$\tau = 0.182$ (Baseline)	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
Percentile 0 to 5	0.161	0.295	0.169	0.171	0.159	0.192
Low Skill Households	0.218	0.392	0.213	0.195	0.191	0.234
Medium Skill Households	0.116	0.233	0.141	0.149	0.114	0.129
High Skill Households	0.069	0.134	0.093	0.118	0.096	0.108
Percentile 5 to 10	0.165	0.011	0.136	0.141	0.207	0.121
Low Skill Households	0.162	0.013	0.138	0.150	0.230	0.141
Medium Skill Households	0.181	0.011	0.145	0.134	0.172	0.093
High Skill Households	0.138	0.004	0.111	0.117	0.167	0.081
Percentile 10 to 25	0.283	0.302	0.438	0.454	0.303	0.322
Low Skill Households	0.318	0.337	0.474	0.464	0.315	0.349
Medium Skill Households	0.279	0.307	0.451	0.457	0.290	0.277
High Skill Households	0.175	0.202	0.299	0.406	0.273	0.275
Percentile 25 to 50	0.384	0.382	0.250	0.234	0.331	0.364
Low Skill Households	0.302	0.258	0.175	0.191	0.264	0.276
Medium Skill Households	0.417	0.436	0.259	0.260	0.423	0.502
High Skill Households	0.586	0.627	0.467	0.359	0.464	0.536
Percentile 50 to 100	0.007	0.010	0.007	0.000	0.000	0.000
Low Skill Households	0.000	0.000	0.000	0.000	0.000	0.000
Medium Skill Households	0.008	0.013	0.005	0.000	0.000	0.000
High Skill Households	0.032	0.034	0.031	0.000	0.000	0.000

Notes: This table reports the human capital accumulation for children with innate ability below the 33^{th} percentile for the baseline economy and for when we vary the taxation in the economy. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 36: Wage Distribution for Children below the 33^{th} Percentile of Innate Ability - Taxation

Percentile of Wages	$\tau = 0.1$	$\tau = 0.182$ (Baseline)	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
Percentile 0 to 5	0.295	0.161	0.169	0.171	0.159	0.192
Low Skill Households	0.392	0.218	0.213	0.195	0.191	0.234
Medium Skill Households	0.233	0.116	0.141	0.149	0.114	0.129
High Skill Households	0.134	0.069	0.093	0.118	0.096	0.108
Percentile 5 to 10	0.011	0.165	0.136	0.141	0.207	0.121
Low Skill Households	0.013	0.162	0.138	0.150	0.230	0.141
Medium Skill Households	0.011	0.181	0.145	0.134	0.172	0.093
High Skill Households	0.004	0.138	0.111	0.117	0.167	0.081
Percentile 10 to 25	0.302	0.283	0.438	0.454	0.303	0.322
Low Skill Households	0.337	0.318	0.474	0.464	0.315	0.349
Medium Skill Households	0.307	0.279	0.451	0.457	0.290	0.277
High Skill Households	0.202	0.175	0.299	0.406	0.273	0.275
Percentile 25 to 50	0.382	0.384	0.250	0.234	0.331	0.364
Low Skill Households	0.258	0.302	0.175	0.191	0.264	0.276
Medium Skill Households	0.436	0.417	0.259	0.260	0.423	0.502
High Skill Households	0.627	0.586	0.467	0.359	0.464	0.536
Percentile 50 to 100	0.010	0.007	0.007	0.000	0.000	0.000
Low Skill Households	0.000	0.000	0.000	0.000	0.000	0.000
Medium Skill Households	0.013	0.008	0.005	0.000	0.000	0.000
High Skill Households	0.034	0.032	0.031	0.000	0.000	0.000

Notes: This table reports the wage for children with innate ability below the 33^{th} percentile for the baseline economy and for when we vary the taxation in the economy. It also presents the wage depending on if the child being born in a low, a medium or a high skill household. The percentiles of wage are calculated based on the wage distribution for old children, $w_\omega h_{c,o}$, which in turn depends both on human capital accumulation and occupation/education.

Table 37: Educational Attainment for Children above the 66^{th} Percentile of Innate Ability - Taxation

Educational Attainment	$\tau = 0.1$	$\tau = 0.182$ (Baseline)	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
At Least Elementary School	1.000	1.000	1.000	1.000	1.000	1.000
Low Skill Households	1.000	1.000	1.000	1.000	1.000	1.000
Medium Skill Households	1.000	1.000	1.000	1.000	1.000	1.000
High Skill Households	1.000	1.000	1.000	1.000	1.000	1.000
At Least High School	0.512	0.552	0.576	0.710	0.825	0.867
Low Skill Households	0.382	0.423	0.462	0.580	0.720	0.789
Medium Skill Households	0.468	0.547	0.548	0.821	0.983	1.000
High Skill Households	0.929	0.989	0.995	1.000	1.000	1.000
At Least College	0.258	0.322	0.340	0.367	0.364	0.351
Low Skill Households	0.149	0.187	0.197	0.180	0.192	0.216
Medium Skill Households	0.253	0.280	0.291	0.448	0.523	0.491
High Skill Households	0.557	0.849	0.900	0.973	0.881	0.775

Notes: This table reports the educational attainment for children with innate ability above the 66^{th} percentile for the baseline economy and for when we vary the taxation in the economy. It also presents the educational attainment depending on if the child being born in a low, a medium or a high skill household.

Table 38: Human Capital Distribution for Children above the 66^{th} Percentile of Innate Ability - Taxation

Percentile of Human Capital	$\tau = 0.1$	$\tau = 0.182$ (Baseline)	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
Percentile 0 to 50	0.101	0.018	0.014	0.011	0.013	0.034
Low Skill Households	0.168	0.033	0.026	0.018	0.021	0.055
Medium Skill Households	0.054	0.002	0.002	0.004	0.000	0.000
High Skill Households	0.000	0.000	0.000	0.000	0.000	0.000
Percentile 50 to 75	0.261	0.388	0.378	0.326	0.416	0.329
Low Skill Households	0.336	0.495	0.482	0.419	0.499	0.406
Medium Skill Households	0.275	0.372	0.379	0.286	0.351	0.238
High Skill Households	0.038	0.069	0.054	0.021	0.142	0.113
Percentile 75 to 90	0.384	0.355	0.354	0.384	0.336	0.354
Low Skill Households	0.362	0.322	0.327	0.346	0.295	0.331
Medium Skill Households	0.381	0.369	0.364	0.415	0.358	0.368
High Skill Households	0.447	0.435	0.415	0.474	0.496	0.448
Percentile 90 to 95	0.111	0.140	0.146	0.184	0.094	0.169
Low Skill Households	0.067	0.111	0.114	0.154	0.074	0.124
Medium Skill Households	0.126	0.144	0.147	0.191	0.122	0.235
High Skill Households	0.207	0.224	0.245	0.293	0.137	0.265
Percentile 95 to 100	0.142	0.099	0.108	0.095	0.140	0.114
Low Skill Households	0.067	0.038	0.051	0.063	0.111	0.084
Medium Skill Households	0.164	0.113	0.108	0.104	0.169	0.159
High Skill Households	0.308	0.272	0.286	0.212	0.225	0.174

Notes: This table reports the human capital accumulation for children with innate ability above the 66^{th} percentile for the baseline economy and for when we vary the taxation in the economy. It also presents the human capital accumulation depending on if the child being born in a low, a medium or a high skill household. The percentiles of human capital are calculated based on final human capital distribution for old children, $h_{c,o}$.

Table 39: Wage Distribution for Children above the 66^{th} Percentile of Innate Ability - Taxation

Percentile of Wages	$\tau = 0.1$	$\tau = 0.182$ (Baseline)	$\tau = 0.2$	$\tau = 0.3$	$\tau = 0.4$	$\tau = 0.5$
Percentile 0 to 50	0.101	0.018	0.014	0.011	0.013	0.034
Low Skill Households	0.168	0.033	0.026	0.018	0.021	0.055
Medium Skill Households	0.054	0.002	0.002	0.004	0.000	0.000
High Skill Households	0.000	0.000	0.000	0.000	0.000	0.000
Percentile 50 to 75	0.322	0.345	0.332	0.276	0.241	0.329
Low Skill Households	0.374	0.449	0.429	0.369	0.327	0.406
Medium Skill Households	0.369	0.340	0.342	0.219	0.132	0.238
High Skill Households	0.053	0.008	0.005	0.016	0.052	0.113
Percentile 75 to 90	0.298	0.364	0.364	0.434	0.447	0.354
Low Skill Households	0.300	0.350	0.361	0.396	0.448	0.331
Medium Skill Households	0.251	0.370	0.367	0.483	0.454	0.368
High Skill Households	0.366	0.400	0.369	0.479	0.425	0.448
Percentile 90 to 95	0.137	0.159	0.164	0.142	0.159	0.169
Low Skill Households	0.073	0.125	0.125	0.126	0.093	0.124
Medium Skill Households	0.161	0.160	0.167	0.143	0.246	0.235
High Skill Households	0.269	0.271	0.281	0.213	0.298	0.265
Percentile 95 to 100	0.142	0.114	0.126	0.136	0.140	0.114
Low Skill Households	0.067	0.043	0.058	0.092	0.111	0.084
Medium Skill Households	0.164	0.127	0.122	0.152	0.169	0.159
High Skill Households	0.308	0.322	0.346	0.292	0.225	0.174

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