

Import competition and social mobility: Evidence from Brazil

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There is a large body of literature studying the effects of trade shocks on worker's job and wage losses. However, little is known about whether these effects transmit into the next generation. In this paper, we exploit the increased Chinese import competition in Brazil to evaluate how this shock affected children of exposed fathers. We use an specific survey module containing precise retrospective questions on parental employment and education, among other characteristics. Our findings suggest that children from more exposed fathers have less education and earnings in their adulthood. We also find a higher likelihood of having and informal or operational employment and social assistance dependence. Importantly, these effects are larger for children from low socio-economic backgrounds, suggesting that the trade shock decreased intergenerational mobility and accentuated poverty traps.

JEL codes: I24, J62, F14, F16, J23.

Keywords: social mobility, trade shocks, education, incomes, Brazil.

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1 Introduction

In recent decades, local labor markets were disrupted by a process of increasing globalization and trade liberalization. The resulting trade-induced contraction of local labor demand has received special attention in the literature, showing adverse outcomes for workers from sectors suddenly exposed to global competitive supply. In this paper, we build upon this literature and study the intergenerational implications of trade shocks. More specifically, we evaluate whether parental exposure to these shocks affected children's outcomes in their adulthood.

There is an extensive literature on the immediate impact of trade shocks on income and employment, typically showing job and wage losses among workers most exposed to import competition (Topalova, 2010; Autor et al., 2013; Kovak, 2013; Hakobyan and McLaren, 2016; Caliendo et al., 2019, among others). Recent contributions complement these findings by focusing on the long-run local labor market effects of these shocks, finding mixed results (Dix-Carneiro and Kovak, 2017; Utar, 2018; Autor et al., 2021; Kovak and Morrow, 2022). However, little is known about whether trade shocks transmit into the next generation, i.e., the children of affected parents. Theoretically, the effect of parental job or wage loss on their offspring's ultimate human capital accumulation and earnings in their adulthood is ambiguous. Labor market adjustments and migration could completely vanish the effects over the years (Kovak and Morrow, 2022). Moreover, adverse local conditions can delay children's labor market entry incentivizing education (Greenland and Lopresti, 2016). However, the exposure to parental unemployment at crucial ages can imply scarring effects, undermining investments on education and future employment opportunities (Schwandt and Von Wachter, 2019; Arellano-Bover, 2020; Von Wachter, 2020; Kaila et al., 2021; Stuart, 2022).

Our paper makes a contribution to the literature studying poverty traps and inequality of opportunity. Theoretical models propose poverty reproduction mechanisms related to under-investments due for liquidity constraints (e.g. Galor and Zeira, 1993), nutritional deficits (e.g. Dasgupta and Ray, 1986) or aspirations (e.g. Genicot and Ray, 2017). Poverty traps are considered one of the

“very big questions” in economics (Banerjee, 2020) and recent papers have provided empirical support to them (Balboni et al., 2022). Importantly, they are directly related to equality of opportunities since the family environment they were born into represents a circumstance beyond individual’s control (Roemer, 1998). Adverse income shocks at crucial ages, such as a parental job loss due to an import competition shock, can hamper poor children to break the poverty circle, thus limiting social mobility. To understand the channels through income shocks can ultimately affect social mobility represents an important topic not only for equity concerns but also because it have been demonstrated that higher social mobility promotes economic development (Hsieh et al., 2019; Neidhöfer et al., 2021).

In this paper we study the intergenerational impacts of a trade shock in Brazil. To do so, we exploit the Chinese rapid opening to trade exporting labor-intensive goods, the so-called “China shock”. Previous contributions have systematically identified the direct effects of the increased Chinese import competition on wage and job losses in developed (Autor et al., 2013; Caliendo et al., 2019, among others) and developing countries, where labor informality represents a relevant margin of adjustment (Costa et al., 2016; César et al., 2021). Then, the China shock represents an unique opportunity to evaluate whether these well-documented large trade shocks effects transmit into the next generation. Among other trade-related data sources, we use an specific survey module containing precise retrospective questions on parental employment and education, among other characteristics such as interviewee’s birth place, education, incomes, migration and first and present employment information.

We help to fill the existing gap in the literature regarding the intergenerational transmission of trade shocks and, more generally, the effects of job losses on children’s outcomes. Our results suggest that children of fathers more exposed to the trade shock show less education and lower earnings in their adulthood. Moreover, we find that these effects are unevenly distributed among children: they are considerable larger for those coming from low socioeconomic backgrounds, suggesting that import competition harmed social mobility and deepened poverty traps. We also find that the trade shock increased the likelihood of having and informal or operational job and produced higher

social assistance dependence, a proxy for poverty. Our results are robust to different import competition measures, timing of the parental job loss and do not depend on migration-related factors or labor participation decisions.

The remainder of this paper is organized as follows: Section 2 describes the Brazilian social context and the increased Chinese import participation, Section 3 our sources of data and our identification strategy. Section 4 shows the results of this paper, and Section 5 concludes.

2 Context

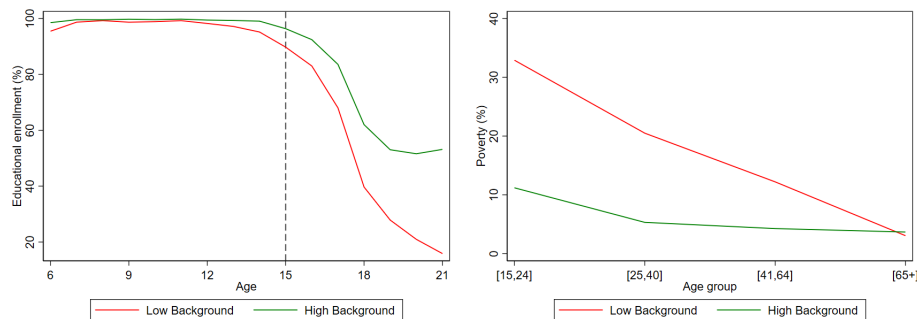
Brazil represents an interesting case study to examine the intergenerational impacts of trade shocks on developing countries for several reasons. The country is one of the most unequal and poor in Latin America, a region already showing high levels of inequality and poverty (Alvaredo and Gasparini, 2015). Importantly, not only present inequalities are significant in Brazil but the country also exhibit one of the lower degrees of social mobility in the region (Neidhöfer et al., 2018, 2021). This means that the opportunities to revert the effects of adverse household income shocks at key educational ages are unevenly distributed among individuals, with children from low socioeconomic backgrounds struggling to break the poverty circle. Another particular characteristic of the Brazilian context is the high levels of labor informality. As shown in recent contributions, informality represents an important margin of adjustment to trade shocks in developing countries (Ulyssea, 2020; César et al., 2021).

Figure 1 describes the socioeconomic context in Brazil. Panel A shows the patterns of educational enrollment (left) and poverty (right) by age and socioeconomic background, measured by parental education. The left figure depicts that the age of 15 years old is crucial in terms of individual's educational outcomes. Enrollment is practically universal for individuals younger than 15, but educational drop-outs raise dramatically for older students in Brazil. This is particular relevant for individuals from low socioeconomic backgrounds. On average, they decrease their rates of school enrollment on about 50 percentage points between the ages of 15 and 18 while their high background counterparts do it in nearly 30 percentage points. As expected, these different edu-

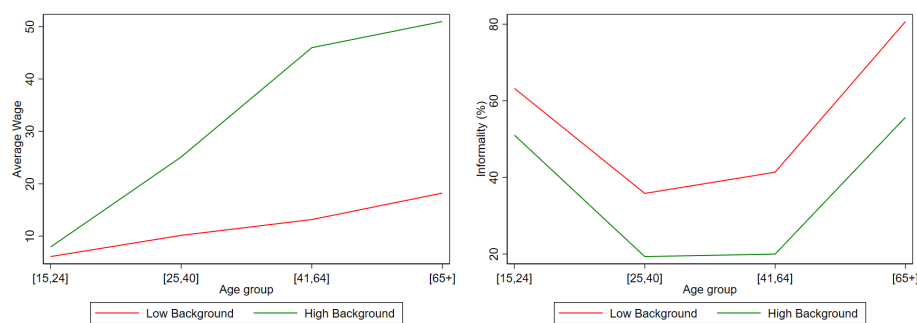
cational opportunities have a direct impact on future incomes. The right figure in Panel A shows that poverty incidence is clearly higher for individuals from low socioeconomic backgrounds, particularly in their prime-age. For example, while the poverty rate for individuals aged between 25 and 40 with high educated parents is about 8%, the same is nearly 22% for those with low education parents. In line with this, Panel B from Figure 1 depicts the evolution of hourly wages and labor informality for the two groups considered. While the incidence of informality is about 20 percentage points higher for individuals from low socioeconomic backgrounds for all age brackets, the difference in wages widens over the years. At the prime age, individuals with high educated parents earns about 3.5 times more than those with low educated parents, on average.

Figure 1: The Brazilian socioeconomic context

Panel A – Education and poverty



Panel B – Wage and informality

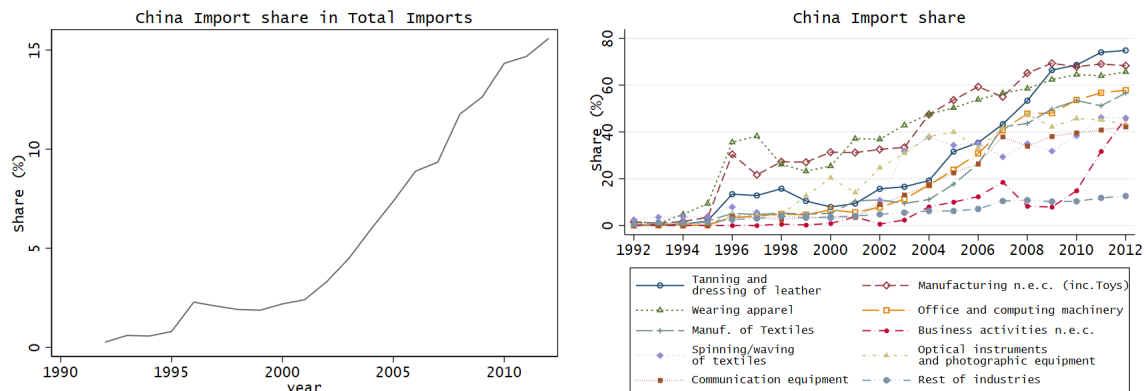


Source: Own elaboration based on *Pesquisa Nacional por Amostra de Domicílios (PNAD) 2014*.

Notes: Socioeconomic background is defined as high if individual's parents have, at least, complete secondary education and low if not. Poverty rates computed using a USD-5.5-a-day poverty line (2011 PPP). Wage is defined as hourly wages. Informality is defined as unregistered workers without rights to social security benefits linked to their jobs.

Beyond its socioeconomic characteristics, Brazil provides an excellent opportunity to study the effects of trade shocks because of the spectacular increase of China's relevance on Brazilian trade. Common to most developing countries, Figure 2 depicts the outstandingly increased participation of China in Brazil's total imports: from nearly zero in the beginning of the 90's to 15% in latest years. Importantly, the increased Chinese share in imports was vastly heterogeneous across economic sectors. Sector more exposed to the increased Chinese competition were mainly manufactures, particularly those related to textiles, toys, clothing and equipment. Own estimates based on the Classification by Broad Economic Categories (BEC, United Nations) shows that about 91% of the goods imported from China in higher exposed sectors were final or consumption goods. In this paper, we exploit this excellent setting already used in a broad range of previous contributions but focusing on the effects on the next generation, rather than on the direct impacts of this trade shock.

Figure 2: Chinese participation in Brazilian trade



Source: Own elaboration based on Comtrade (United Nations).

3 Data and Empirical Strategy

3.1 Data

Our analysis requires information on children and parent's characteristics. Despite most of the households survey contain this information for individuals living in the same household, they are not useful for our analysis for two reasons. First, we need to observe children's outcomes in their adulthood; then, the sample would be severely restricted to those adults still living with their parents. Second, it has been demonstrated that co-residency represents a relevant source of upward bias in social mobility estimates (Emran et al., 2016; Emran and Shilpi, 2019). In addition, longitudinal information on parents and children is scarcely available, in particular for developing countries, representing one of the reasons why studies on the effects of trade shocks are typically focused on the short or medium-run. To overcome this limitations, we use the 2014 version of the *Pesquisa Nacional por Amostra de Domicilios* (PNAD), the main household survey in Brazil carried out by the *Instituto Brasileiro de Geografia e Estatística* (IBGE). Besides including the standard questions regarding interviewee's socioeconomic and employment characteristics, it contains an specific survey module with retrospective questions about parental employment and education, and interviewee's place of birth and first job characteristics. Importantly, parental information is focused to the period when the interviewee had 15 years old. As shown above, it is a crucial age in terms of educational enrollment in Brazil as well as in Latin America (Edo et al., 2017; Marchionni et al., 2019). Moreover, information on parental employment is very precise and rich: sector of employment and occupation are codified at the 5-digit level. This represent an unique feature of the survey which permits an excellent opportunity to perform our analysis.

We also draw on data on international trade flows from Comtrade (United Nations) and information on output at the sector level from UNIDO (United Nations) and World Bank national accounts data., for the 1992-2012 period. All variables are expressed in current dollars. Then, we focus our analysis on individuals born between 1977 and 1997, i.e. had 15 years old between 1992 and 2012. This means that our sample comprises relatively young persons, aged between 18 and 38

when interviewed. Lastly, we compute import competition variables using only father's employment sector. We do not exploit mother's information since about half of them in our sample were not working when their children have 15 years old; this would restrict our sample and possibly bias our results because of mother's selection into employment. Moreover, previous contributions focused on the effects of the China shock in Brazil have found larger wage losses among men than women (Connolly, 2022).

3.2 Empirical strategy

Our empirical analysis is inspired in previous literature and compares the outcomes of children from parents working in sectors facing large Chinese import competition to those whose parental sector faced smaller import competition from China. In order to study the effect of the trade shock on children of exposed father's outcomes, we estimate the following equation:

$$Y_{i,c,r}^{ch} = \alpha_{i,c}^{ch} + \beta CIC_{s,c+15}^P + \gamma X_{i,c}^{ch} + \phi C_c^{ch} + \rho R_r^{ch} + \delta S_s^P + \varepsilon_{i,c,r} \quad (1)$$

where $Y_{i,c,r}^{ch}$ represents, for children i born in year c and region r , different outcomes of interest such as education, wages (in logs), job characteristics, migration and social assistance reception. $CIC_{s,c+15}^P$ is our measure of Chinese import competition in the parental sector of employment s in time $c + 15$, which represents the year when the children was 15 years old. It is computed, as its standard in the literature, as the total value of Chinese export to Brazil ($M_{s,c+15}^{China}$) divided by sectoral output ($Q_{s,c+15}^P$), both at the sector (s) level:¹

$$CIC_{s,c+15}^P = \frac{M_{s,c+15}^{China}}{Q_{s,c+15}^P} \quad (2)$$

In order to consider confounding factors, equation (1) controls for children's characteristics such as gender and migration included in $X_{i,c}^{ch}$ as well as fixed effect by children's birth cohort (C_c^{ch}) and birth region (R_r^{ch}) and parental sector of employment (S_s^P). When we consider children's wages as outcome variable, we add a fixed effect by children sector of employment (S_{sh}^{ch}). These last two fixed effects are included at the 2-digit sector level since we perform this analysis at a 3-digit sector

¹Figure A.1 in the Appendix Section shows the distribution of this variable.

level. Implicitly, our strategy compares worker's children with the same demographic characteristics (gender, age, migration condition, birth place) and similar own and parental employment sector, whose parents were exposed to different levels of import competition from China.

However, the controls for confounding factors in equation (1) may not be enough to identify the causal effect of the trade shock on next generation's outcomes. As noted in previous literature studying the China shock, equation (1) do not capture causality in presence of specific demand or supply shocks independent of the Chinese import competition. This is a particular problem if these shocks occurred in the same sectors as the Chinese import competition increased the most, thus confounding the effects. In addition, changes in local sector employment may also be driven by changes in world prices independent from the China shock, representing another confounding factor not considered in equation (1). To deal with this potential issues, we follow the vast literature evaluating the China shock (Autor et al., 2013; Acemoglu et al., 2016; Costa et al., 2016, among others) and perform an instrumental variables analysis. More precisely, we instrument $CIC_{s,c+15}^P$ with a similar measure but considering the average value of Chinese export to countries (j) other than Brazil (Bra) ($\frac{1}{J} \sum_{j-Bra} M_{s,c+15}^{China}$):

$$ivCIC_{s,c+15}^P = \frac{\frac{1}{J} \sum_{j-Bra} M_{s,c+15}^{China}}{Q_{s,c+15}^P} \quad (3)$$

Intuitively, this variable captures the trade-induced supply shock directly related to the increasing participation of China in global imports due to factors exclusively related to the Chinese trade openness and exogenous to local decisions in Brazil. In other words, $ivCIC_{s,c+15}^P$ represents a forecast of Chinese import competition in Brazil computed from the sector-level global increase in Chinese imports. To check for the robustness of our strategy, in the Appendix Section B we present our main results considering different timing of the parental job loss and using an alternative import competition measure: the share of China in Brazilian imports.

4 Results

In this section, we present the main results of this paper. In Section 4.1 we show the estimates of the effect of the trade shock on the parents generation's employment and wages. Then, in Section 4.2 we focus on children's outcomes. Our estimates implicitly compares worker's children with similar demographic characteristics and parental employment sectors, whose parents were exposed to different levels of Chinese import competition². We start by analyzing the effect on children's education, employment and earnings in their adulthood. We also discuss possible heterogeneous effects by gender and, importantly, by children's socioeconomic background. Following this, we center our attention to the effects on earnings and evaluate two possible channels leading the results: education and labor informality predicted by the shock on parental sector of employment. Finally, we discuss the robustness of our main findings to migration-related factors and labor participation decisions. In the Appendix Section B, we also show our main results considering different import competition measures, and changing the timing of the parental job loss.

4.1 The effects on parents

Table 4.1 shows the effects of the trade shock on fathers' employment and wages, at the sector-level. Columns (1) and (2) evaluates the effects considering manufacturing and mining sectors, while the rest of the columns only consider the first group of sectors. The estimates are robust to both samples and show that, on average, an 1% increase in our measure of Chinese import competition decreased parental employment and wages in about 0.44%. This result is in line with previous findings for Latin American countries, despite these contributions exploit a regional approach (Costa et al., 2016; César et al., 2021). Results from Table 4.1 then suggest that our identification strategy captures adverse effects of the trade shock on households incomes and parental employment at the years when children were about 15 years old and lived with their parents. In the next Section, we

²As mentioned in Section 3, we work at the 3-digit sector level while including parental employment sector fixed effects at the 2-digit level. A regression of the endogenous variable, $CIP_{s,c+15}^P$, on all control variables and fixed effects yields an R-squared of about 0.7 suggesting that 30% of the variability of this variable can still be exploited in our regression analysis.

focus on the main contribution of this paper: to study whether these parental wage and job losses have long-lasting consequences on children's outcomes in their adulthood.

Table 1: Effects on parent's generation employment and wage.

	Manufacturing + Mining		Manufacturing	
	Employment (log.)	Wages (log.)	Employment (log.)	Wages (log.)
	(1)	(2)	(3)	(4)
Father CIP	-0.433*** (0.087)	-0.444*** (0.117)	-0.445*** (0.101)	-0.458*** (0.132)
Year FE	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes
Observations	630	630	555	555
F-Stat(KP)	10.65	10.65	8.67	8.67

Source: Own elaboration based on UNIDO (United Nations).

Notes: Estimations at the 3-digit sector level. Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.2 The effects on children

In Tables 2 and 3 we show the effects of the Chinese import competition on children's education, and employment and earnings, respectively. In all the specifications, the F-statistic indicate that the instrument has a strong predictive power. Figure A.2 in the Appendix presents the scatterplots of the first stage regression showing a positive and strong relationship between the instrument and the endogenous variable. Results from Table 2 suggest that the trade shock affected children's ultimate human capital accumulation: on average, a 1% increase in Chinese import competition on the father's sector produced a decrease of 0.2 years of education and of 1.8 percentage points in the likelihood of completing secondary education. Importantly, columns (2) and (4) show that these effects completely vanish for children from high educated parents, i.e. completed secondary education. This suggest that the trade shock damaged educational social mobility in Brazil.

Additionally, results show that Chinese import competition on father's sector negatively affected children's earnings and job quality in their adulthood.³ Table 3 suggest that, on average, a 1% increase in parental exposure to the shock declined hourly wages in nearly 0.5%, and increased the likelihood of receiving social assistance (conditional cash transfers, CCT) in almost 1 percentage point. Additionally, as previous contributions focused on the short-run effects of trade shocks (Costa et al., 2016; César et al., 2021), we find that labor informality represents a relevant channel through labor adjustment materialize, a distinct feature in developing countries' labor markets. Similar to the effects on children's education, parental education partially offsets, in about a half, these adverse effects on earnings and employment. This implies that the trade shock not only diminished educational mobility but possibly also earnings mobility making more difficult to break poverty circles for children from low socioeconomic backgrounds. Previous contributions suggest that trade shocks impose substantial labor adjustment costs that are highly unevenly distributed across workers according to their skill level: high-skilled workers are better able to move across employers and out of the mostly exposed sectors (Autor et al., 2014). Figure 3 clearly depicts these heterogeneous effects dividing the sample by socioeconomic background and children gender. Results, again, suggest larger adverse effects on children from low backgrounds while the effects on the likelihood of completed secondary and wages are larger for men but not statistically significant. These heterogeneous effects are also relevant for future inequality: lower education and job quality makes individuals from low socioeconomic backgrounds more vulnerable to incoming labor demand shocks, as the recent process of automation shows (Acemoglu and Autor, 2011; Gasparini et al., 2021).

³In the Appendix Section, Tables A.1 and A.2 show additional effects on children's employment and first job characteristics.

Table 2: Effects on children's education

	Education (years)		Prob. Secondary (%)	
	(1)	(2)	(3)	(4)
Father CIP	-0.216*** (0.055)	-0.253*** (0.062)	-1.842*** (0.675)	-2.359*** (0.690)
Father CIP*Secondary Educ.		0.151*** (0.035)		1.666*** (0.433)
Controls	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes
Observations	6912	6107	6912	6107
F-Stat(KP)	51.03	31.73	51.03	31.73

Note: Controls = gender and migration. ; High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Effects on children's employment and earnings.

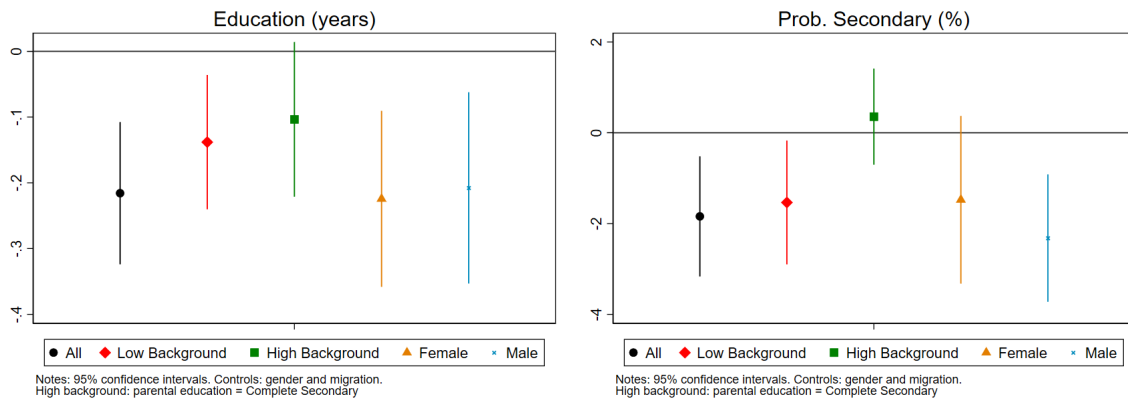
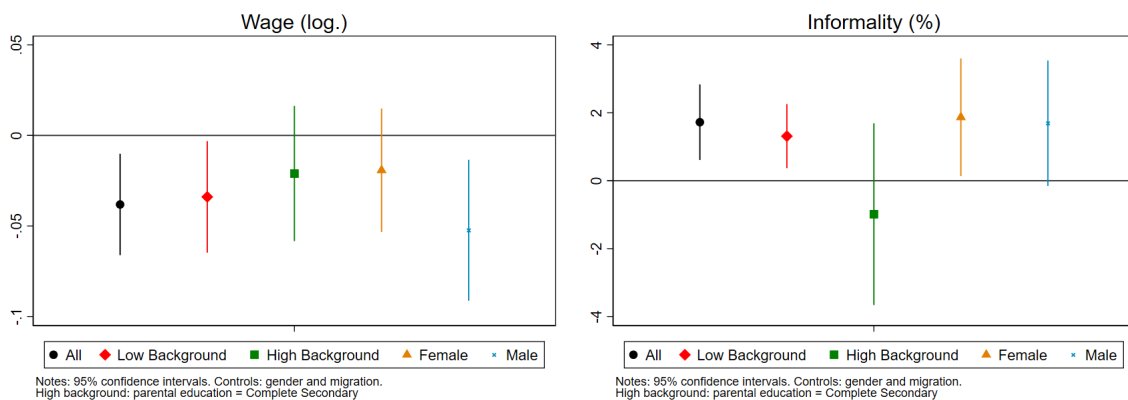
	Wage (log.)		Informality (%)		CCT Reception (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
Father CIP	-0.049*** (0.015)	-0.056*** (0.015)	1.724*** (0.568)	1.354*** (0.426)	0.733* (0.384)	0.917*** (0.341)
Father CIP*Secondary Educ.		0.022*** (0.006)		-0.350*** (0.124)		-0.421*** (0.061)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Own Sector FE	Yes	Yes	Yes	Yes	No	No
Observations	4613	4022	4613	4022	6935	6125
F-Stat(KP)	26.69	17.92	26.69	17.92	48.96	30.27

Notes: Controls = gender and migration. ; High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 3: Heterogeneous effects on children's education, employment and wage.

Panel A – Education**Panel B – Wage and informality**

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Next, we focus on the results on children's earnings in order to evaluate possible channels through which the shock on parental sector of employment affected them. In particular, we are interested on testing whether the entire effect on children's wage in their adulthood is dominated by the effects on education or there are other channels, such as employment quality, affecting earnings. To do so, we perform a Duflo-like regression approach (Duflo, 2004) to estimate the effect on children's wage using the predicted values of education and labor informality by the shock on parental sector of employment. In other words, we explain wages with the forecast

of how children's average education or informality would have been in absence of any factors affecting it other than the trade shock on the parental sector. Columns (1) and (2) from Table 4 show the relevance of the educational channel in explaining the effects of the trade shock on children's wages in their adulthood: on average, a one-year reduction in the expected years of education explained solely by the effect of the shock decreases wages in 27%. This result is in line with the sharp rise in educational dropouts at the age of secondary education previously discussed in Section 2; in fact, nearly 40% of the individuals in our sample have an educational level just before complete secondary. In columns (3) and (4) we estimate the relevance of the job quality mechanism approximated by labor informality, once controlling for own education. The results suggest that the expected children's likelihood of having an informal job explained by the shock has a negative effect on wages. In line with results from Tables 2 and 3, the effects of the predicted education and labor informality are not different by socioeconomic background since the trade shock affected mostly children from low educated parents.

Table 4: Effects on children's wages. Educational and job quality channels.

	Wage (log.)			
	(1)	(2)	(3)	(4)
Own Education (years)	0.276*** (0.101)	0.300** (0.120)		
Own Education (years)*Secondary Educ.		-0.018 (0.018)		
Informality (%)			-0.029*** (0.010)	-0.041*** (0.014)
Informality (%)*Secondary Educ.				0.005 (0.006)
Controls	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes
Own Sector FE	Yes	Yes	Yes	Yes
Observations	4599	4013	4613	4022
F-Stat(KP)	7.67	3.16	11.17	3.51

Notes: Controls = gender and migration. ; High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Informality refers to unregistered workers without rights to social security benefits linked to their jobs.

Lastly, our findings could be, at least in part, affected by children's migration and labor participation decisions. In a conventional spatial equilibrium model, migration can act as a buffer to adverse exogenous shocks with children from most affected parents moving to regions offering better employment opportunities. Also, unfavorable local conditions could discourage children's labor market participation (Hardoy and Schøne, 2014); this could also lead to a worker selection into employment. In presence of migration and labor participation responses, our estimates should be interpreted as lower bound of the true effect of the trade shock and children's outcomes. In Table 5 we study the effects of the increased Chinese competition on children's migration and labor participation. Results suggest that the trade shock had a small and negative or zero effects on

migration (both at municipality and state level)⁴, labor participation and employment rates. As previous contributions shown, there is little evidence for geographic mobility to act as a mechanism through which labor adjustment operates after a trade shock (Autor et al., 2013, 2014; Dix-Carneiro and Kovak, 2017; Autor et al., 2021). This imperfect worker’s mobility gradually amplifies initial adverse labor demand shock, which helps to explain their transmission into next generations.

Table 5: Effects on children’s migration and employment

	Migration (municipality) (%)		Migration (state) (%)		Labor Participation (%)		Employment (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Father CIP	-0.862**	-0.823**	-0.083	-0.171	0.217	0.181	0.008	0.018
	(0.412)	(0.415)	(0.243)	(0.234)	(0.446)	(0.449)	(0.422)	(0.423)
Father CIP*Secondary Educ.		-0.087		-0.005		0.017		-0.034
		(0.210)		(0.065)		(0.158)		(0.155)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6935	6125	6935	6125	6935	6125	6935	6125
F-Stat(KP)	48.92	30.23	48.92	30.23	48.96	30.27	48.96	30.27

Note: Controls = gender and migration (columns 5-8). ; High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5 Conclusions

In this paper, we evaluated the intergenerational effects of a trade shock. Different from most of the literature focused on the direct implications of trade-induced contraction of local labor demand on worker’s wages and employment, we studied whether parental exposure to these shocks affected children’s outcomes in their adulthood. To do so, we exploited the well-documented effects of the increased Chinese import competition as a case study and take advantage of an specific survey module containing precise retrospective questions on parental employment and education, among other characteristics.

⁴We perform these estimates based on variables indicating individual’s actual migration instead of predicted migration or population change at the regional level, as previous contributions does. This permit us to abstract from possible misspecifications due to the bilateral nature of location choices (Borusyak et al., 2022).

We found that children from parents most exposed to the trade shock show less education and earnings in their adulthood, as well as a higher likelihood of labor informality and social assistance dependence. Importantly, we showed that these effects are considerably larger for children from low socioeconomic backgrounds, suggesting that the trade shock damaged social mobility and exacerbated poverty traps. We also found that the adverse effect on earnings not only comes through the educational channel but also via job quality mechanisms. Our results are robust to migration and labor participation decisions, different measures of exposure to the trade shock, and not sensitive to parental job loss timing.

As far as we know, this is the first paper in studying the intergenerational impacts of trade shocks, also contributing to the literature of scarring effects and poverty traps. The intergenerational implications of household income shocks are particularly interesting in developing context where social mobility is low, as in the case of Brazil. Our results have important implications from a policy perspective. They show that the effect of income shocks do not vanish over the years as labor markets adjust, for example, as a response to a trade-induced decrease in labor demand. On the opposite, these effects are transmitted into the next generation affecting children's outcomes in their adulthood and limiting social mobility. As previous contributions have shown, improving social mobility can be a driver of economic development. Moreover, the adverse effects on children's education and job quality increase their exposition to future labor demand shocks such as the recent processes of automation and robotization. Hence, policies should focus on prevent disruptions to human capital formation and promote formal jobs, in order to smooth long-lasting adverse effects of future shocks.

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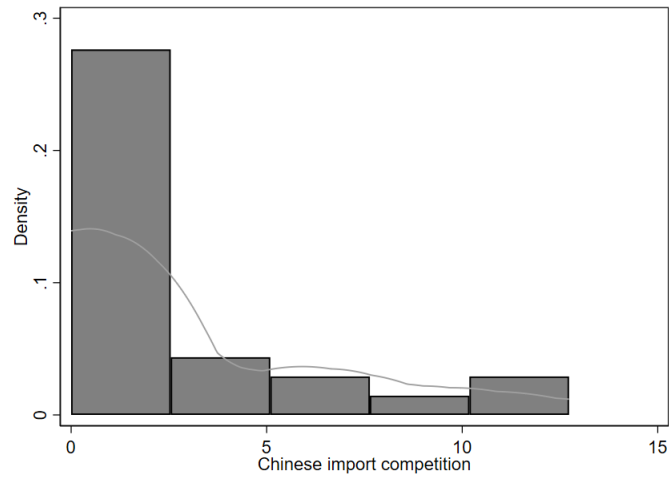
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ONLINE APPENDIX

A Additional results

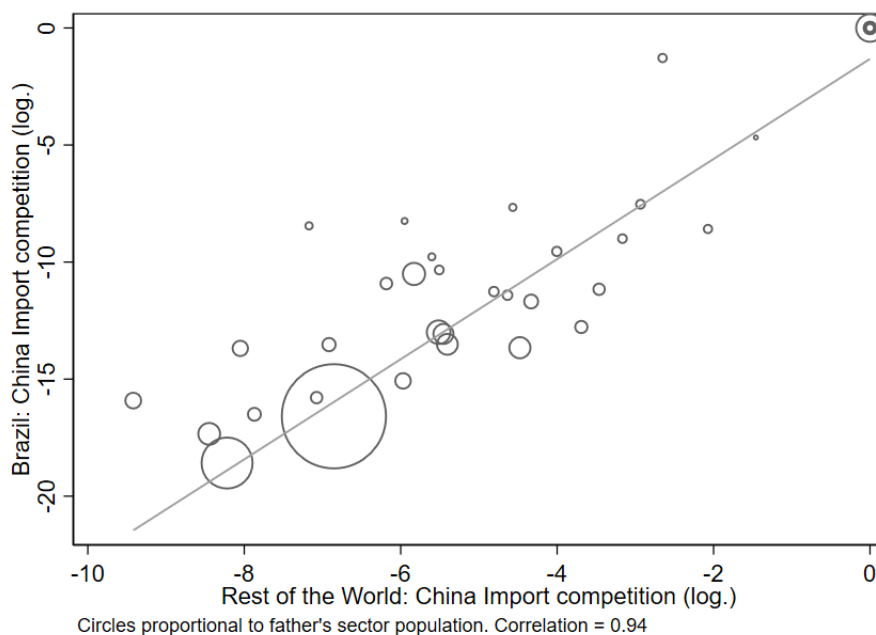
Figure A.1: Chinese import competition (CIC) distribution at the sector level.



Source: Own elaboration based on UNIDO and Comtrade (United Nations).

Notes: Estimations at the 3-digit sector level.

Figure A.2: First stage estimation.



Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.1: Effects on children's: additional employment outcomes

	Hrs. Worked (log)		NT Sector (%)		Operational (%)		Operational (broader) (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Father CIP	-0.001 (0.008)	0.002 (0.007)	0.059 (0.603)	-0.259 (0.566)	-0.010 (0.574)	0.199 (0.413)	-0.284 (0.765)	0.171 (0.647)
Father CIP*Secondary Educ.		-0.003 (0.002)		0.715*** (0.256)		-0.690*** (0.225)		-1.327*** (0.280)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5111	4468	5111	4468	5084	4443	5084	4443
F-Stat(KP)	27.12	19.41	26.72	18.89	26.29	18.65	26.29	18.65

Note: Controls = gender and migration. NT Sector=Non-Tradable sector Operational: 8 and 9 1-digit CIUO; Operational (broader): 7, 8 and 9 1-digit CIUO
Note: High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.2: Effects on children's first job characteristics.

	Informality (%)		Operational (%)		Operational (broader) (%)		NT Sector (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Father CIP	1.006 (0.634)	0.798 (0.614)	2.151** (0.914)	2.226** (0.921)	1.433 (0.999)	1.816* (0.960)	-1.312 (0.914)	-1.499* (0.896)
Father CIP*Secondary Educ.		0.483*** (0.174)		-0.882*** (0.317)		-1.441*** (0.300)		0.746*** (0.235)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3578	3203	6098	5361	6098	5361	6113	5374
F-Stat(KP)	35.68	110784	39.44	349	39.44	180	39.28	25.78

Note: Controls = gender and migration. NT Sector=Non-Tradable sector Operational: 8 and 9 1-digit CIUO; Operational (broader): 7, 8 and 9 1-digit CIUO

Note: High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Informality refers to unregistered workers without rights to social security benefits linked to their jobs.

B Robustness checks

Table A.3: Effects on children's outcomes. 2-year window.

	Education (years)		Prob. Secondary (%)		Wage (log.)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Father CIP	-0.157*** (0.043)	-0.192*** (0.051)	-1.351*** (0.452)	-1.765*** (0.475)	-0.031*** (0.006)	-0.038*** (0.007)	-0.025*** (0.006)	-0.030*** (0.006)
Father CIP*Secondary Educ.		0.151*** (0.038)		1.670*** (0.466)		0.021*** (0.006)		0.013*** (0.005)
Own Education (years)							0.062*** (0.011)	0.063*** (0.009)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Own Sector FE	No	No	No	No	Yes	Yes	Yes	Yes
Observations	6912	6107	6912	6107	4613	4022	4599	4013
F-Stat(KP)	55.54	28.85	55.54	28.85	71.91	37.68	72.12	37.85

Notes: Controls = gender and migration.; High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Estimates considering a 2-year rolling window average of CIC. Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4: Effects on children's education and earnings. Alternative CIC measure.

	Education (years)		Wage (log.)	
	(1)	(2)	(3)	(4)
Father CIP	-0.081*** (0.024)	-0.165*** (0.042)	-0.007** (0.003)	-0.019*** (0.005)
Father CIP*Secondary Educ.		0.156*** (0.042)		0.020*** (0.006)
Controls	Yes	Yes	Yes	Yes
Born Year FE	Yes	Yes	Yes	Yes
Birth Region FE	Yes	Yes	Yes	Yes
Father Sector FE	Yes	Yes	Yes	Yes
Own Sector FE	No	No	Yes	Yes
Observations	6908	6103	4611	4020
F-Stat(KP)	21.6	9.83	22.02	12.7

Notes: Controls = gender and migration. ; High parental education = Complete Secondary

Source: Own elaboration based on PNAD, UNIDO and Comtrade (United Nations).

Notes: Estimates CIC as percentage share of China in Brazilian imports. Robust standard errors clustering at the sector level indicated in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.