



Globalization and human capital

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Natalie Bau, Adrien Matray, Manisha Shah

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GLOBALIZATION AND HUMAN CAPITAL: EVIDENCE FROM FOREIGN CAPITAL LIBERALIZATION IN INDIA^{*}

Natalie Bau[†] Adrien Matray [‡] Manisha Shah [§]

1 Introduction

Expanded access to foreign capital could be a tool to unlock economic growth in low-income countries (Bank, 2020). Yet, critics have also suggested that reforms liberalizing the economy in lower-income countries like India are "Anti-Poor" (Rajan, 2002) and can have negative distributional consequences (Ray, 2010). Policies promoting the liberalization of trade and foreign capital have been contentious and sparked protests throughout the world.

As discussed by Edmonds (2022), the effects of foreign capital liberalization on human capital attainment are ambiguous. On the one hand, if foreign capital liberalization raises adults' wages, it may increases the resources available to invest in children's schooling. Similarly, if it increases the returns to education because children need certain skills to take advantage of new work opportunities, it may again increase educational investment. On the other hand, if liberalization increases in wages in lower skilled jobs (e.g. manufacturing jobs), it may increase the opportunity cost of schooling (Atkin, 2016; Shah and Steinberg, 2017), leading children to dropout. Furthermore, if liberalization policies harm some individuals, such as small producers and unskilled workers, who experience more intense competition from larger firms that receive foreign direct investment, it may reduce those individuals' resources to educate their children. The effects of liberalization on children's work and human

[†]UCLA, NBER, BREAD, and CEPR. Contact: nbau@ucla.edu

[‡]Princeton. Contact: amatray@princeton.edu

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[§]UCLA, NBER, and BREAD. Contact: manishashah@ucla.edu

capital may also vary with the types of industries liberalized. If manufacturing liberalization tends to increase the availability of higher-paid, low-skilled jobs, this may reduce educational investment and increase youth labor. On the other hand, if service sector liberalizations tend to increase the availability of well-paid, higher-skilled jobs, they may incentivize educational investment and decrease youth labor (Jensen, 2012; Oster and Steinberg, 2013).

To understand how different liberalization episodes affect children's work and human capital investment, we exploit an unusual natural experiment from India. During the late 1990s and early-to-mid 2000s, access to foreign capital was liberalized in different industries at different times.¹ Thus, we can estimate the effect of foreign capital liberalization without resorting to cross-country comparisons, which are usually required in settings where all industries in a country are liberalized at once. These reforms allow us to estimate the effects of foreign capital liberalization on child labor exploiting cross-district variation in children's exposure to foreign capital liberalization due to the pre-reform industry-mix of the district. Moreover, since reforms occurred in different sectors, we are able to estimate the effects of service and manufacturing sector liberalizations.

Our preliminary findings suggest that liberalization episodes in both the services and manufacturing sectors reduced human capital investment. Following a large shock to the share of employees in liberalized manufacturing sectors in an Indian district, the likelihood that a child aged 5–17 reports being enrolled in school as his primary activity immediately declines. By 5 years after the shock, the likelihood of enrollment has fallen by 4 percentage points. Shocks to the service sector are also associated with a reduction in enrollment of approximately 2 percentage points. However, we caution that these findings are preliminary, and more work is needed (as outlined in Section 5) to (1) ensure these results are robust, and (2) to understand the mechanisms underlying these average effects (e.g., whether they are driven by changes in the opportunity costs or resources).

Our results most closely relate to an existing literature on the effects of trade liberalization in India. Topalova (2010) finds that declines in poverty in the 1990s in India were attenuated in districts that experienced more import competition after trade liberalization. This in turn translates into relative declines in education and increases in child labor (Edmonds et al., 2010, 2009). However, ex-ante, it is unclear that foreign capital investment will have the same distributional consequences as the trade liberalizations did in India. Indeed, Topalova (2010) finds that earlier FDI reforms than the ones studied in this paper were associated with reductions in poverty. If FDI increases household incomes, and increased incomes reduce child labor (e.g., see Edmonds and Pavcnik (2005)), if the income effect dominates,

 $^{^{1}}$ Bau and Matray (2022) used this variation to study the effects of foreign capital liberalization on capital misallocation in India's manufacturing sector.

we might expect child labor to fall. Given that one cannot infer the direction of the effects of foreign capital liberalization from the trade liberalization literature in India, we contribute by directly measuring the effects of foreign capital liberalization (an important globalization policy) on human capital investment and child labor.

2 Context & Data

2.1 Policy Change

Until 1991, when India experienced a balance of payment crisis, it was a closed, socialist economy. Foreign capital investment was regulated by the Foreign Exchange Regulation Act (1973), which capped investment at 40% of domestic firms' equity in most industries and mandated that each foreign investment required individual approval by the regulator. Following the crisis, under pressure from the World Bank, IMF, and Asian Development Bank, India underwent a series of liberalization reforms, liberalizing trade, licensing, and foreign investment. At this time, investment caps were raised to 51% for industries comprising approximately 40% of manufacturing firms, and the approval process for foreign investments became automatic. In subsequent years, India liberalized foreign investment to additional, specific disaggregated industries in both the manufacturing and service sectors in the same way. Details on the timing of these industry-specific reforms at the highly disaggregated 5-digit industry-level were collected from India's *Handbooks of Industrial Policy*.

Since a large number of policy changes happened at the same time in the early-90s, and data quality from that period is poorer, this paper focuses on measuring the effects of the subsequent liberalizations of foreign investment during the 2000s. Bau and Matray (2022) provide evidence that these reforms did effect Indian firms, suggesting that they also may have affected Indian labor markets. Combining this policy variation with data on medium and large firms' outcomes in the CMIE Prowess firm-level data set, Bau and Matray (2020) show that the financial liberalization in manufacturing increased treated firms' capital investment by 30%.

2.2 Data Sources

Measure of Policy Affectedness. To measure district-level policy affectedness, we combine data on foreign capital liberalization episodes during the late-1990s and 2000's from editions of the *Indian Handbook of Industrial Policy and Statistics* at the highly disaggregated five-digit industry code-level with industry code information in the 1998 Indian Economic Census. Time-varying, district-level treatment intensity measures are generated as follows: $intensity \ manufacturing_{dt} = \sum_{j \in manufacturing} I_{jt}(liberalized) \times \omega_{jd,1990}$ $intensity \ services_{dt} = \sum_{j \in services} I_{jt}(liberalized) \times \omega_{jd,1990},$

where d indexes a district, j indexes an industry, and t indexes a year, $\omega_{jd,1990}$ is the share of employment in district d for a disaggregated industry j according to the 1990 Indian Economic Census, and $I_{jt}(liberalized)$ is an indicator variable equal to 1 if an industry had been liberalized as of year t. In addition to calculating $\omega_{jd,1990}$ as the full share of employment in industry j, we also calculate versions of these measures where $\omega_{jd,1990}$ is the share of employment at firms with more than a cut-off number of employees (e.g., 50 or 100). This reflects the fact that larger firms are more likely to be the recipients of FDI.

The left panels of Figures 1 and 2 show the geographic distribution of the continuous measures *intensitymanufacturing*_{dt} and *intensityservices*_{dt} for 2011 (our last year of data). The figures show that (1) exposure is highly variable across districts, and (2) and there substantial geographic variation even within regions. Therefore, our empirically strategy does not simply rely on broad differences across regions, which may be on different time trends or adopt very different policies.





The left figure plots the distribution of the continuous measure *intensity manufacturing*_{d,2011} by district in India. The right figure plots the locations of districts that are above the 2011 median for the *intensity manufacturing*_{d,2011} measure.



Figure 2: Geographic Distribution of $intensity \ services_{dt}$ in 2011

The left figure plots the distribution of the continuous measure *intensity* $services_{d,2011}$ by district in India. The right figure plots the locations of districts that are above the 2011 median for the *intensity* $services_{d,2011}$ measure.

Outcomes: National Social Sample (1994-2011). Our outcome variables are drawn from rounds 45-68 of the National Social Sample Survey Schedules 1 and 10. The National Social Sample (NSS) is a nationally representative household survey conducted by India's Ministry of Statistics and Programme Implementation, surveying a repeated cross-section of roughly 100,000 households per round. Importantly, both schedules of the NSS include a primary activity status variable, which measures whether individual households members are employed (and how much time they spend working) or in school. The data also include information on total education and industry of occupation. We harmonize these data to form a panel at the district-level, which can be combined with the treatment measures from the census data to measure the effects of foreign capital liberalization.

3 Empirical Strategy

As a preliminary approach, we estimate the effects of the foreign capital liberalization on children's outcomes using event study graphs. We estimate

$$y_{idt} = \sum_{s \neq -1} \gamma_s I_{dt}^s + \alpha_d + \phi_t + \epsilon_{idt}, \tag{1}$$

where y_{idt} is an outcome (such as indicator variables for children engaging in work or attending school as primary activities), I_{dt}^s is an indicator variable equal to 1 if it s years after the district's value of intensity manufacturing_{dt} moved above the median value of intensity manufacturing_{d,2011} or intensity services_{d,2011} (2011 is the final year of data), and α_d and ϕ_t denote district and year fixed effects. Then γ_s estimates the effect of being "treated" (moving from a below to above median treated district) s years after the treatment occurred. We restrict the sample to school-aged children (those aged 5–17). The right panels of Figures 1 and 2 show the locations of the districts that have above median exposure to the manufacturing and services reforms by the end of the study period. These figures yet again confirm that exposure is highly geographically variant and is not concentrated in specific regions.

The key assumption of this empirical strategy is that there would have been parallel trends between more and less intensely treated districts in the absence of the policy. When s < 0, the γ_s estimates provide a test for whether trends were parallel prior to the treatment. If this is the case, γ_s should not significantly differ from 0 for s < 0. Under the parallel trends assumption, when s > 0, the γ_s estimates capture the dynamics of the liberalization's treatment effects on intensively treated districts relative to less intensively treated districts over time.

4 Preliminary Results

Figures 3 and 4 report the estimates from equation (1) when the outcome variable is attending school and the treatments are respectively the estimates for the effect of moving above the median share of ex-ante manufacturing and services employment in liberalized industries for firms with more than 50 employees. In both cases, we see that increasing the liberalization affectedness of a district is associated with a decline in the average child's likelihood of enrollment. By five years after becoming an above median district, the likelihood a child is enrolled has declined by 5 percentage points in districts that received the manufacturing shock and 2 percentage points in those that received the services shock. For manufacturing, the pre-treatment estimates of γ are all close to 0, consistent with parallel time trends in the pre-treatment period. For services, the estimates of γ for s < 0 are more noisy, but there is no evidence of a persistent negative trend in the years leading up the liberalization shock.

We note that these results are preliminary and require additional analysis before they can be interpreted. The negative effect on schooling after the manufacturing liberalization is consistent with Atkin (2016), who finds that positive shocks to manufacturing increase the opportunity cost of schooling and negatively affect human capital. However, other forces could also explain these effects and require more investigation. One possibility is that, if the liberalization increased economic activity and attracted in-migration, the composition of

Figure 3: Effect of Moving Above the Median Share of Manufacturing Employees in Liberalized Industries on Education



These graphs report the γ estimates from equation (1) when the outcome is an indicator variable for a child attending school.

Figure 4: Effect of Moving Above the Median Share of Services Employees in Liberalized Industries on Education



These graphs report the γ estimates from equation (1) when the outcome is an indicator variable for a child attending school.

children may change in treated districts. If disadvantaged family migrate or the disruption of migration affects schooling, this may negatively affect the estimates in Figures 3 and 4. A second possibility is that the liberalization negatively affected some household's, e.g. if small firms or self-employed individuals were negatively impacted by competition from larger firms that gained access to FDI. This could causally reduce education, but due to an income channel rather than opportunity cost channel. In Section 5, we describe our plan to further investigate these channels.

5 Next Steps

Our preliminary results suggest financial liberalization may have reduced education. If this is the case, it points to a little-studied cost of financial liberalization. This is also consistent with findings on the effects of trade liberalization by Edmonds et al. (2010) and manufacturing expansions by Atkin (2016). However, before concluding there is a causal reduction in education, we must ensure that our results are robust to additional local labor market-level controls (e.g., for other contemporaneous policy changes in India) and then seek to better understand the mechanisms underlying these effects. To understand the role of migration, we will estimate event study graphs for the effects of the two types of liberalizations on inmigration. Figures 5 and 6 indeed provide evidence that the reforms increased in-migration, but they also suggest that in-migration is likely too small for compositional changes to fully explain the educational effects from direct effects on education, we can also re-plot the figures only including a sample of non-migrants.

To understand the role of opportunity costs versus income shocks, we can estimate equation (1) for different age groups (we expect only older children to be affected by the opportunity cost effect, while younger children may benefit from positive wage shocks to parents) and with indicator variables for working in different industries as outcomes. If children are more likely to be working in the same sectors that are liberalized, this is consistent with the opportunity cost mechanism. Finally, to evaluate the role of income effects, we can estimate equation (1) with per capita household consumption and adult wages as outcomes. Additionally, as we expect negative effects may be concentrated among the less skilled in the treated industries, we can estimate heterogeneous effects by the household head's skill level and industry of employment. Figure 5: Effect of Moving Above the Median Share of Manufacturing Employees in Liberalized Industries on In-Migration



These graphs report the γ estimates from equation (1) when the outcome is an indicator variable for a household reporting having in-migrated into the district.

Figure 6: Effect of Moving Above the Median Share of Services Employees in Liberalized Industries on In-Migration



These graphs report the γ estimates from equation (1) when the outcome is an indicator variable for a household reporting having in-migrated into the district.

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