[Tentative Title]
Learning by Learning?
International Trade Affects Local Human Capital Investment Decisions

Jose Rojas-Fallas

January 31, 2024

Abstract

Foreign Direct Investment (FDI) has been associated with economic growth via human capital attainment in developing economies. These gains can come from increasing educational attainment. Most of the focus has been on primary and secondary attainment, but tertiary education is increasingly important as developing economies search for marginal gains. Beyond the extensive margin, FDI may have direct implications on the intensive margin; what major is chosen in university?

Using public university enrollment and FDI data from Costa Rica, I look to answer whether FDI causes a behavioral change on the choice of major for university students. Any observable effect could imply an avenue through which a nation's high-skill comparative advantage can shift in the long-run.

Keywords: FDI, Tertiary Education, Educational Attainment, Developing Nations

Conception and Definition of the Project

Can we observe an effect of FDI on human capital accumulation decisions through tertiary education choices? More specifically, does FDI impact the academic field an individual chooses when enrolling in tertiary education?

I propose to answer this by looking at the temporal interaction between FDI and university enrollment data of public schools in Costa Rica. The enrollment data allows me to directly observe tertiary education decisions at the intensive margin as I am able to observe the enrolled major by the individual student. The FDI data, although at an aggregate level, is reasonably mapped by industry of destination. To put both datasets together, majors can be mapped into aggregate industry/fields to concord with FDI measures. The enrollment data codes majors into broad areas using United Nations Educational, Scientific and Cultural Organization (UNESCO) categories.

The driving mechanism for this analysis starts with Multinational Enterprises (MNEs) entering an international market via an FDI channel. Their entry shocks local labor demand distribution by offering both low and high-skill employment opportunities. Local agents that are on the margin of choosing their college career observe the new labor market context and adapt to the new demand by choosing a major in the field of MNE labor demand. Because returns to tertiary education comes from completing a degree, there is a lagged shift in the local high skill labor distribution in the economy.

Project Significance

Previous literature studying the effects of FDI on developing economies has primarily focused on economic growth, which has been partially explained by accumulation of physical and human capital. Noticeably, previous works have shown some evidence using a macroeconomic approach, using panel studies and cross-country analyses of how FDI impacts mean

levels of GDP (Alvarado et al., 2017), average years of schooling attained at the national level (Blanchard and Olney, 2017; Kheng et al., 2017), and aggregate enrollment counts (Mughal and Vechiu, 2011). While these approaches are valuable to gain a high-level understanding, my proposed research looks to provide a more granular answer to the FDI-Human Capital question.

I propose to answer this using a microeconomic focus, where individuals are aggregated to field of studies that map onto observed industry levels of FDI. A micro-founded analysis should provide a more direct and behavioral answer to how FDI impacts human capital accumulation through educational attainment decisions. Additionally, this project would provide intuition as to how FDI affects decisions beyond the extensive choice of education on human capital investment; namely, the effects on field of specialization by high-skill individuals.

This project adds to existing literature by providing evidence of whether FDI has an intensive-margin effect on human capital accumulation. This is an important research agenda with many possible avenues to explore (Blomstrom and Kokko, 2002), where understanding possible positive spillover effects of FDI, if any, can h ave wide policy implications for developing nations interested in attracting future FDI. Although varying effects on labor, educational outcomes, and the efficiency of FDI have been found across different geographic regions Mughal and Vechiu (2011); Atkin (2016); Alvarado et al. (2017); Kheng et al. (2017); Dey and Mishra (2018), there is a gap of how human capital accumulation can be altered because of FDI, particularly through educational attainment. Results from this research can have implications on how nation's long-term growth can be influenced through FDI and can lend evidence to how nations comparative advantage in high-skill labor can shift through foreign investments.

A significant contribution of my proposed research is the data it will use. To address the tertiary educational attainment part, I have data consisting of the entire universe of

enrollment data for all major public universities in Costa Rica.[1] This dataset consists of anonymized individual-level enrollment-by-major-by-year information for all enrolled students. It also has limited demographic information on individuals (age and sex) as well as province and county of residence. This data, to my present knowledge, has not been used in this type of analysis.

Plan of Work and Methodology

This project is in its nascent stages, with some data collection having been partially done and high-level literature review been completed. There is also an initial proposed model, which mostly serves as the "ideal data model" but still requires work to fit the actual data that has been collected. I am working with my advisor in order to get through the theory and econometric hurdles as they come along. The initial model is:

$$\begin{aligned}\text{Applications}_{j\in k,t,u} = \beta_1 \cdot \text{FDI}_{k,t-s} + \beta_2 \cdot \text{Employment Variables}_{k,t} + \\ \beta_3 \cdot \text{University Variables}_{j\in k,u,t-s} + \gamma_u + \gamma_t + e_{k,t,u}\end{aligned}$$

Where $\text{Applications}_{j\in k,t,u}$ is the number of applications for major j which falls into industry k at year t in university u. The main variable of interest is $\text{FDI}_{k,t-s}$ which captures the effect of cumulative/lagged FDI inflows for industry k at time $t-s$. Because prospective students care for their potential labor market outcomes, their decision to apply into major j will be partially determined by labor conditions (wages, employment opportunities, labor market share, etc.) of industry k at year t. Due to the structure of the university admissions process in Costa Rica, such as an entry cutoff grade for each major j, $\text{University Variables}_{j\in k,u,t-s}$ is a vector of university admission variables that prospective students factor at the time of applying into major j.

[1] Universidad de Costa Rica, Universidad Nacional, Tecnológico de Costa Rica, Universidad Técnica Nacional, Universidad Estatal a Distancia

Due to the inherent endogeneity of FDI and human capital accumulation, I need to find a plausibly exogenous process to deal with this confounder. The main concern here is that MNEs entering the Costa Rican economy may be self-selecting as they can observe the existing and incoming availability and quality of the tertiary education system. I am still actively thinking about possible solutions to this. My initial thoughts are to use a lagged measure of FDI on time t enrollment decision.

There are also concerns on how unique majors can be mapped onto industries due to the nature of transferable skills gained from tertiary education. I am searching for a concordance map that will allow me to do so. Currently, I am using aggregate areas for each major as defined by UNESCO.

In regards to the status of my data, the collected data I have is limited in sample period (2016-2023 for enrollment) so I have contacted the Costa Rican institutions responsible for it. As of writing this I have received a reply stating my request "has been received and will be forwarded to properly be taken care of". The enrollment data I do have has $\tilde{7}$00k observations and expands all university campuses and enrolled students. I am also reviewing publicly available datasets on FDI inflows from the Costa Rica Central Bank, which so far looks to have promising features that I have not fully explored.

Having identified a possible gap in the literature that poses an important question for developing economies and policy-makers in these contexts, I believe that this project has promise. Overall, the data I have collected is enough to start initial statistical and econometric work, and its novelty makes it an exciting prospect. I am excited to begin working on this through the summer and possibly extend this into something that can become my Job Market Paper.

Obligations

I have no outside employment plans that would cause any conflict with receiving the Kleinsorge Fellowship. I also have no travel plans for the summer.

References

Alvarado, R., Iñiguez, M., and Ponce, P. (2017). Foreign direct investment and economic growth in Latin America. *Economic Analysis and Policy*, 56:176–187.

Atkin, D. (2016). Endogenous Skill Acquisition and Export Manufacturing in Mexico. *American Economic Review*, 106(8):2046–2085.

Blanchard, E. J. and Olney, W. W. (2017). Globalization and human capital investment: Export composition drives educational attainment. *Journal of International Economics*, 106:165–183.

Blomstrom, M. and Kokko, A. (2002). Fdi and human capital: A research agenda. *OECD: OECD Development Centre: Paris Technical Paper No. 195*.

Dey, D. and Mishra, A. S. (2018). A Study on FDI in Education Sector and Its Impact on Gross Enrolment Ratio in Higher Education in India: An Econometric Approach. *International Journal of Management Studies*, V(3(6)):44.

Kheng, V., Sun, S., and Anwar, S. (2017). Foreign direct investment and human capital in developing countries: a panel data approach. *Economic Change and Restructuring*, 50(4):341–365.

Mughal, M. and Vechiu, N. (2011). The role of Foreign Direct Investment in higher education in the developing countries (Does FDI promote education?).