

EXIM BANK : RESEARCH BRIEF

Essays on Education and Institutions in Developing Countries



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Export-Import Bank of India (Exim Bank) instituted the BRICS Economic Research Annual Award in 2016. The objective of the Award is to promote advanced doctoral research in international economics, trade, development and related financing, by nationals of any of the five member nations of BRICS, from any university/ educational institution globally. This study is based on the doctoral dissertation titled “Essays on Education and Institutions in Developing Countries” selected as the award winning entry for the Exim Bank BRICS Economic Research Annual Award (BRICS Award) 2019, written by Dr. Tushar Bharati, currently Assistant Professor of Economics, University of Western Australia Business School, University of Western Australia. Dr. Bharati received his doctoral degree in 2018 from the University of Southern California, USA.

Introduction

All economic theories seeking to explain why some countries are richer than others agree on the important role of education. The questions that then follows is what explains the differences in educational attainment across countries, regions, and people. The answer to this question requires an understanding of the production function of education. What are the inputs in the production of educational attainment? How might different inputs, like a school in the neighbourhood and teacher quality, interact? Do public policies and the broader institutional setup of the country have a role to play? The study combines theoretical predictions with empirical evidence from different developing countries to examine these questions.

These questions are of special interest to BRICS member nations. With the fourth industrial revolution set to disrupt the production structure drastically, automation and artificial intelligence might wipe out the

comparative advantage of cheap labour that BRICS nations possessed. If we are to take advantage of the impending technological revolution, investment in human capital should be treated as a priority.

Accumulation of human capital is considered crucial for the diffusion of modern economic growth to the developing regions of the world. Higher levels of human capital are also associated with the evolution of better institutional infrastructure and are desirable in their own right. Despite large investments in education, educational attainments remain low in much of the developing world.

The first section examines the extent to which a supply-side intervention aimed at improving access to schools helped individuals recover from an early-life shock. The second section examines the joint effect of two public policy programs in Tanzania- the Iodine Supplementation Program (ISP) and the Primary Education Development Program (PEDP). The final section examines the role

of co-ethnic voting in the election of bad quality representatives, who, allegedly, undermine the effectiveness of such policies.

While the sections in this study use data from India and non-BRICS nations of Indonesia and Tanzania, the findings are of relevance to all BRICS members. Indonesia and Tanzania, with their large and diverse populations and comparative advantage in labour-intensive production, face some of the same impediments as the BRICS nations.

Recovery from an Early Life Shocks

Recent research in epidemiology, economics, and public health have established the crucial role of early-life conditions play in shaping the educational attainment of people later in life. From diseases to weather, from pollution to maternal stress, many dimensions of early-life experiences matter. Even mild and brief shocks to early-life environment can have sizable effects. Shielding or insuring all vulnerable people against shocks

to all different dimensions of early life environment is unfeasible. From the stand point of public policy, it is of immense importance to find out whether corrective investment policy ameliorate the negative effect of adverse early-life shocks? For example, it is now well-known that the weather in the year of birth of a child, be it through its impact on a household's income or through disease environment, affects the cognition of the child. This changes the child's benefit from attending school and, as a result, her probability of attending school. Can a reduction in the cost of attending school, say due to a reduction in the child's transportation cost to school, counteract the negative effect of bad weather in early life?

Against this background, a section of the study examines the extent to which the Indonesian primary school construction program (hereon, INPRES) of the 1970s, that improved access to primary schools, helped individuals overcome an early life resource shock as proxied by low rainfall in the first year of life. This section investigates the joint effect of rainfall shocks in the first year after birth and of a large-scale school construction program, the INPRES program, on the educational attainment of the exposed individuals. Both high rain in the first year of life and the primary school construction program had a positive effect on education separately. In terms of recovery from early-life shock, an individual who experienced less than historical level of rainfall in the first year of life, but had two schools constructed in her district under the INPRES program, recovered completely from the early life shock, catching up to those who experienced more than the historical median level of rainfall in the first year of life.

Additionally, there is no impact of school construction for those who experienced good rain in the first

year of life. Evidence suggests that the school expansion may have been accompanied by deteriorating school infrastructure and increased competition to get into middle and high schools. The study finds that, even for cohorts not exposed to the INPRES school construction program, above-median levels of rainfall in the first year after birth were associated with a higher probability of going to school and higher levels of education. Once the INPRES program was rolled out, the high rainfall individuals, who would have been more likely to be in school even without the program, suffered more due to deteriorating quality and increased competition than low rainfall individuals. Consistent with the deteriorating quality argument, as schools got more time to respond to the situation, the difference in the impact of INPRES vanished.

The findings speak optimistically to the problem of not being able to shield all individuals from all kinds of mild early-life shocks. Nurturing can counteract differences that result from nature playing dice. The evidence on recovery from early shocks, especially from developing countries where these shocks are more frequent and severe and the avoidance mechanism less developed, is limited. To better understand remediation and inform policy designs, it is crucial to understand what kinds of early-life disadvantages can be mitigated, which policies are more cost-effective in facilitating recovery, and what are the mechanisms by which remediation is accomplished. For example, subsidies aiming to incentivize demand for education tend to have an "anchoring" or a "background contrast effects" - individuals are unwilling to pay a higher price for a product once the subsidy ends or is reduced. In comparison, supply-side policies like the INPRES school construction are less-expensive and do not have an anchoring effect. Thanks to the

richness of the data used in the study, recovery along different dimensions of well-being are also evaluated and suggestive evidence on the potential pathways is also presented.

The study underscores the need for joint evaluation of different shocks affecting educational attainment - human capital attainments are determined not only by all the investment made in the skill's production process across the years but also the interaction of these investments with each other. The study also underlines that examining or detecting dynamic complementarity in the production of human capital is difficult when the production function is not fully specify and estimate. The exogenous natural shocks or policy intervention affecting investments in human capital might also affect the levels of other complementary inputs or the production function itself. On the policy front, by better identifying the beneficiaries of large-scale programs like INPRES, the study contributes towards a more sophisticated cost-benefit analysis of such programs. While data-limitations constrain limit the study's ability to inspect the factors behind the swift recovery of the education infrastructure after the program, documenting it points to possible policy lessons to be learned from its in-depth examination.

Joint Evaluation of Two Public Programs in Tanzania

As the effect of school construction on teacher quality in the first section of the study documents, the prevailing institutional environment has an important bearing on what and how much the education policies can achieve. The second section of the study adds to this evidence. It documents the unintended consequence of a public health program on the school starting age and education that was partly influenced by the economic environment of the region.

The section examines the joint effects of two public programs, the Iodine Supplementation Program (ISP) and the Primary Education Development Program (PEDP), on the grade attainment of 10 to 13 years old children. The study finds that exposure to ISP, a health policy that targeted pregnant women and, consequently, their in-utero babies, was negatively associated with completed schooling of those exposed. PEDP abolished all primary school fees and, as expected, had a positive impact on educational attainment. There also existed a significant negative interaction effect of ISP and PEDP on educational attainments - children who were exposed to both ISP and PEDP had lower educational attainments by the time of the survey than children not exposed to either or one of the two programs. Evidence suggests that the two programs and their interaction had impacts on primary school starting age that mirror the impacts on the level of schooling completed by 2004. ISP exposure was associated with a delay in primary school starting age. PEDP had a negative effect on starting age. The interaction of the two programs was positively correlated with starting age. The association of the two programs and their interaction with educational attainments almost vanish once primary school starting age is controlled for suggesting that school start age was the primary mechanism. Individuals who delayed entering school spent more time working on the family farm and doing household chores suggesting that delayed entry was due to positive returns from pre-school training.

The ratio of the impacts of the two programs and their interaction on educational attainment by the time of the survey and on primary school starting age provides a measure of the rate at which children convert years in school into completed years of schooling. Compared to individuals exposed to PEDP but not ISP, those

exposed to ISP are better at converting years in school into completed years of schooling. This is consistent with previous research that claims that those exposed to ISP saw an improvement in their cognition. This also documents how the effectiveness of one public policy might crucially depend on the performance of past policy initiatives.

The results underline the importance of careful consideration of behavioural responses to policies. The finding that smarter individuals delayed enrolment and worked at home or on the family farm is not completely surprising in an economy based around traditional modes of production where returns to experience may be higher than returns to education. When educational policies are not synchronized with the demands of the local economic environment, improved educational attainments, even in places where it is achieved, may fail to translate into growth and welfare in the short-run. And the lack of returns to investment in education might depress the demand for education further.

The last two sections make a case for policy intervention to promote education. The quality of political institutions can affect the efficient implementation of these policies. In such scenarios, education policies need to be complemented with policies like the introduction of subsidies for modern agricultural equipment, to improve the returns from education even in the short-run.

Co-ethnic Voters and Candidate Choice by Political Parties

Such streamlining of government policies would be possible with responsible legislations. Developing countries need to focus on improving their governance standards. Voters in the developing regions hold the responsibility of choosing the best candidate who would play a

responsible role in the legislative framework. Voters need to choose their representative without being biased with their preferred ethnicity, but with the focus on other characteristics, such as education, experience etc.

The third section documents a second source of inefficiency that may result due to co-ethnic voting. The section presents a theoretical model that points out that strategic action of political parties in constituencies with voters who vote co-ethnically might be a bigger reason for the selection of candidates. Political parties in regions with co-ethnic voters might believe that they can win elections to an office by appealing to the ethnic preferences of voters. In an attempt to field a candidate of an ethnicity that will maximize their vote bank, they ignore better options available to them. This might result in voters having to choose from the available pool of candidates.

The predictions of the model are then tested against data from elections in two states of India - Uttar Pradesh and Bihar. The model predictions are validated. Political parties respond to both the ethnic composition of voters (demand effect) and the ethnicity of candidates from opposition parties (competition effect) when selecting the candidates to field for elections. A comparison of the candidates running for office from constituencies where such differentiation is possible with candidates from constituencies where such differentiation is limited due to affirmative action laws suggests that candidate selection process differs due to the strategic differentiation.

The results also suggest a few solutions to the problem of co-ethnic voting. For example, the paper finds that in constituencies where, due to the affirmative action policies in place, candidates of only a specific ethnicity can contest for elections and, as a result, diversification along

the dimension of ethnicity is not a common feature. As a result, parties ensure that the candidates they run are from the best option available to them. This implies that co-ethnic voting, and, therefore, this strategic differentiation by political parties should be less prevalent in constituencies with better information.

The study contributes to the understanding of the impact of voting behaviour on economic outcomes in multiple ways. At a theoretical level, it is the first attempt to model the strategic consideration for a political party when faced with voters with co-ethnic preference and political rivals that internalize the co-ethnic preference of voters. Second, since differentiation of candidates along ethnic lines by political parties is an attempt to appeal to the social identity of voters, the model also adds to the scarce theoretical literature on the relation between social identity and political competition. Third, the study points out that the challenges of co-ethnic voting in India might be underestimated if we do not consider the strategic ethnic differentiation by political parties. It is the first study to decouple the direct contribution of co-ethnic voting towards election of candidates in Indian elections from its indirect effect through the strategic response of political parties to 'perceived' co-ethnic preferences of the voters. The study reports some evidence suggesting that the election of a candidate to office is more-likely as a result of the voters facing a pool of candidates from same ethnicity rather than the voters deliberating on making choices based on other parameters like education, legislative experience etc.

Conclusion

Over the last fifty years, significant

progress has been made in improving global primary school enrolments. The gross primary enrolment rate has gone up from a little over 50% in 1970 to 90% in 2014 in Sub-Saharan Africa and around 70 % in 1970 to 109 % in 2014 in South Asia. But universal schooling is still a distant goal. The low educational attainment of those who are still left out can often be traced back to 'development insults', their early exposure to adverse conditions such as illness and/or inappropriate feeding practices, which have long lasting impact on their educational attainment. Against this backdrop, the first section of the study points out that the negative impact of these early life adverse circumstances can be mitigated with timely corrective policies. This provides a new impetus to the public policy aimed at alleviating poverty of education and wealth.

However, improvements in educational attainments have not always translated proportionately into reductions in poverty. Over 50% of the population of South Asia and 66.5% of the population in Sub-Saharan Africa were living under the US\$ 3.20 per day PPP poverty line in 2013. The prevailing economic environment of a region has important bearing on what and how much the education policies can achieve. The second section documents that, in Tanzania, smarter individuals delayed enrolment and worked at home or on the family farm due to the higher returns from experience in an economy based around traditional agriculture. When educational policies are not synchronized with the demands of the local economic environment, improved educational attainments may fail to translate into growth and welfare. The lack of returns to investment in education might depress

the demand for education further. In such scenario, education policies need to be complemented with policies to improve the returns from education.

A capable legislature is a prerequisite for streamlining of policies. The third section of the study shows that as long as voters remain uneducated and uninformed, political parties will continue leveraging our differences for their own benefits. The solution, once again, lies in improving educational attainments of people.

The sections, together, suggest a virtuous cycle of education and effective policy making. Better educated voters will cease to rely on ethnic and racial identities when choosing their representatives. These representatives, with better qualifications, will plan and implement more effective policies. These policies will, in turn, provide corrective investments for the population left behind and improve their educational attainment.

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