

The Tertiary Tilt: Education and Inequality in the Developing World

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Summary. — Education is widely perceived to be a tonic for the rising inequality that often accompanies development. But most developing-country governments tilt their education spending toward higher education, which disproportionately benefits elites. We find that in countries with high “tertiary tilts,” rising primary enrollment is associated a decade later with far higher inequality—not the lower Gini coefficients many would expect. Since most developing countries tilt their spending toward higher education, our analysis suggests that efforts that concentrate only on expanding mass education, such as the UN’s Millennium Campaign, could end up raising inequality in much of the developing world.

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Key words — inequality, education, primary education, education spending, MDGs, development

1. INTRODUCTION

Investments in education are widely perceived to be a tonic for inequality. Educate the poor and many will catch up to the elites; deny them education and they will fall further behind. This intuitively appealing logic has been one of the rationales behind a variety of policy interventions to spread primary education across the developing world, including, most prominently, the UN’s Millennial Campaign for universal primary education.

But precisely because it seems obvious, the presumed link between primary education and inequality has been subjected to little serious scrutiny. Do higher primary enrollment rates really reduce economic inequality?

Our investigation of this question yields a surprising answer. Looking across the developing world, we find that higher primary enrollment rates are generally associated with somewhat *higher*, not lower, inequality in the future. We find that a one-standard-deviation increase in primary enrollment—about 19 percentage points—is associated, a decade later, with a Gini coefficient that, depending on the model specification and control variables, is between .02 and .04 points higher than it would otherwise have been.

We further demonstrate that this higher inequality is related to a common feature of education spending in many developing countries. Most education systems in the developing world exhibit what we term a “tertiary tilt”: their educational resources are concentrated on students in higher education, not primary education. In developing countries without a tertiary tilt—those that concentrate their education resources on the primary level—our analysis confirms the commonly assumed positive relationship between primary enrollment and inequality: higher primary enrollment rates are associated with lower future inequality. But countries that focus on their primary schools are the exceptions. Most developing countries have high tertiary tilts in their spending, and in these countries

increased primary enrollment is associated with substantially higher future inequality.

This association is cause for concern. While inequality may or may not slow growth directly¹, large distributional divides almost certainly exacerbate domestic conflict² as well as raising deeper moral and philosophical concerns.³ Our analysis reveals the tertiary tilt to be such a pervasive feature of developing country politics that, without a substantial adjustment in the developing world’s current education spending priorities, a major boost in primary enrollment of the sort envisaged by proponents of the UN’s second Millennium Development Goal (MDG) would likely be accompanied by substantially higher inequality in most developing countries.

This paper is in five sections. In the first we analyze the relationship between primary enrollment rates and future inequality, and find that they are positively associated in cross-national data. Section 2 introduces the “tertiary tilt,” and Section 3 estimates a model of inequality in which primary enrollment interacts with the government’s tertiary tilt. Here we find that greater primary enrollment is associated with higher future inequality when spending is skewed toward students in higher education (as it is in most developing countries), but that it is associated with lower future inequality in

* We are grateful to Timothy Besley, Brian Gaines, Miles Kahler, Thandika Mkandawire, Ofer Malamud, Lant Pritchett, Anouk Rigterink, Kenneth Shadlen, Piero Stanig, Borge Wietzke, seminar participants at the London School of Economics and at the Annual Meetings of the American Political Science Association in Washington, DC, and three anonymous reviewers for *World Development* for valuable comments and advice on earlier versions. Lloyd Gruber would also like to thank the STICERD/LSE Annual Fund New Researcher Award for providing generous financial support while this research was being carried out. Final revision accepted: August 10, 2013.

countries exhibiting a primary tilt. The fourth section discusses these findings and the fifth section concludes.

2. PRIMARY ENROLLMENT AND INEQUALITY

In line with the 2nd MDG, the past four decades have seen primary enrollment rates skyrocket across much of the developing world. The 2010 United Nations *Human Development Report* noted: “[n]o country has seen declines in literacy or years of schooling since 1970...[S]ince 1960 the proportion of people who attended school has risen from 57% to 85%.” (United Nations, 2010, pp. 36–38). Primary completion rates have also been rising, as governments have made greater use of conditional cash transfer programs and other promising initiatives (Fiszbein & Schady, 2009).

This massive increase in primary enrollment rates might have been expected to reduce inequality in developing countries.⁴ There is reason to think that higher primary enrollments would reduce the wage premia formerly enjoyed by a handful of workers—the educated elite—by allowing broader access to skills valued in the labor market, lowering inequality as a consequence. In industrialized countries, there is a well-established negative association between educational attainment and earnings inequality.⁵

But have primary enrollments really been associated with lower inequality in developing countries? The presumed connection between primary enrollment and inequality has, until now, received surprisingly little empirical scrutiny. In studies of inequality, the common practice has been to account for the role of education by including a measure of secondary, not primary, education. For example, Higgins and Williamson (1999) include the secondary school enrollment ratio in their model of inequality “to capture the intuitive notion that broader access to education reduces inequality” (p. 20). Other studies, notably the seminal Li, Squire, and Zou (1998) paper that introduced the empirical model on which much of the later literature is based, also focus on secondary education. But even the relationship between secondary education and inequality is not completely clear. While several papers do find an inverse relationship between secondary enrollments and inequality (e.g. De Gregorio & Lee, 2002; Higgins & Williamson, 1999; Perotti, 1996), the coefficient on the secondary enrollment rate is often only barely significant. And Li *et al.* (1998) find a country’s initial level of secondary education to be associated with significantly *higher* future inequality.⁶

We thus know relatively little about the relationship between primary enrollment and inequality. To that end, we begin our analysis by estimating a version of the standard Li *et al.* (1998) model that includes the primary enrollment rate as an explanatory variable. In the Li *et al.* model, inequality (measured by the Gini coefficient) is determined by two factors: the poor’s access to financial markets and constraints on the ability of elites to expropriate wealth from others. We proxy these factors with three variables:

- the ratio of M2 to Gross Domestic Product (GDP) (*M2*);
- the country’s level of democracy (*Democracy*); and
- the availability of land, measured as hectares of arable land per capita (*Land*).⁷

In addition, we include two measures of economic development—GDP per capita and growth in GDP per capita—to account for the Kuznets hypothesis that development has a U-shaped relationship with inequality:

- per-capita GDP (*GDPpc*); and
- growth in per-capita GDP (*Growth*).

Finally, we control for overall education spending as a percentage of GDP (*TotEduExp*), lagged by 10 years, to account for Sylwester’s (2002) finding that countries that spent more on education in the past had lower inequality in the future.

Our variable of primary interest is the primary gross enrollment ratio, *PrimEnroll*, which is ratio of the total number of primary students to the number of children of primary school age in the population.⁸ Since we would not expect educational attainment levels to affect inequality immediately, we lag both *TotEduExp* and *PrimEnroll*. We use a lag of 10 years, on the rationale that many students begin primary school at age 5 or 6 and are likely to begin work at age 15 or 16.

In our specification, then, *Inequality* depends upon: education spending lagged 10 years (*TotEduExp*_{*t*−10}); the primary enrollment ratio lagged 10 years (*PrimEnroll*_{*t*−10}); a vector of the five control variables noted above that previous studies have shown to be important determinants of inequality (*z*’), fixed country effects (*η*), and an error term *ε* where each variable is indexed by country (*i*):

$$\text{Inequality}_{i,t} = \beta_0 + \beta_1 \text{PrimEnroll}_{i,t-10} + \beta_2 \text{TotEduExp}_{i,t-10} + \beta_3 \mathbf{z}' + \eta_i + \varepsilon_{i,t} \quad (1)$$

Because our focus is on the developing world, we exclude all OECD countries from the sample except Mexico and South Korea, both of which were still “developing” during much of the period we are investigating. Our data are from the World Bank’s *World Development Indicators* database, with the exception of *Democracy*, which we proxy with the commonly-used Polity IV measure (Marshall & Jaggers, 2000). Cross-national time series data are notoriously incomplete, and this is particularly true of cross-national data on inequality. The two inequality indicators we use as our dependent variables were both constructed with data taken from household income surveys; only some countries undertake such surveys, and those that do collect these data rarely do so on a regular basis. The *World Development Indicators* database provides Gini coefficients and decile income shares for 142 countries since 1980, for instance, but 47 of these have only one observation through 2008, and only 46 have more than four observations.

Any large-*N* empirical investigation of inequality must therefore proceed with a good deal of caution. To smooth year-to-year variation, inequality data are usually divided into 5- or 10-year intervals. But the particular periodization can also bias estimates. On the assumption that no year- or period-average perfectly reflects the underlying parameters, we estimate our models using three different ways of slicing the data. The first two take averages of the data over 5-year periods, one beginning in 1967 and extending to 2007 and another starting in 1965 and running to 2005. The third cut is yearly data. Our primary estimation technique is Feasible Generalized Least Squares (FGLS), a procedure that allows us to control for autocorrelation, a particular concern with inequality because it is highly persistent over time.⁹

Table 1 displays our estimates of Eqn. (1) for our three samples. The dependent variable we are modeling in these specifications is the Gini coefficient, the traditional measure used in inequality research, as compiled by the World Bank. As an extra robustness check, we also run all our estimations with inequality operationalized as *P90Share*, the percentage of a country’s total income or consumption accruing to the richest 10-percent of households for a given year, also as reported by the World Bank. The estimates we obtain with this second operationalization are nearly identical to those with the Gini coefficient. Further investigation using a third

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