Does Expanding Higher Education Equalize Income Distribution? The Case of the BRIC Countries

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Abstract

Background. This paper examines the complex relationship between higher education expansion and income inequality in developing countries using a standard human capital model and empirical data from the BRIC countries—Brazil, Russia, India, and China. We also estimate the fraction of public subsidies going to various income groups in each country. We find that mass higher education expansion did not, in and of itself, appear to have decreased income inequality in the BRICs and that students from families at different levels of the income distribution have received vastly different benefits from the public financing of higher education.

Keywords: income distribution; higher education; rates of return; quality of education; affirmative action; fiscal policy

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1. INTRODUCTION

One of the promises of expanding access to education is greater social mobility and income equality. In the case of higher education, as enrollments expand, bright youth from lower income families are more likely to enter and complete university. In theory, this should increase their chances to move upward economically by making them more able to compete for higher paying jobs associated with a higher degree (Becker, 1964). Further, as the number of higher education graduates expands, their relative earnings may fall, eventually making the income distribution more equal (Kuznets, 1955). Indeed, we observe that countries with a high proportion of youth attending and completing higher education generally have significant but relatively modest returns to higher education. The returns in these usually highly developed countries are, on average, lower than in developing countries where a much lower proportion of youth attends higher education (OECD, 2008; Boarini and Strauss, 2010).

However, we also observe rising or continuingly high income inequality over the past two decades in many countries, even those characterized by rapidly increasing numbers of secondary and higher education graduates. This suggests that the relation between higher educational expansion and income distribution may be conditioned by important factors other than simply increasing the average education in the labor force. These other factors include (a) the relative demand for higher educated labor as reflected in rising rates of return to university graduates; (b) fiscal/incomes policies as reflected more generally in government taxation and public spending, and particularly in the pattern of public spending on different tiers of the higher

education system; and (c) the distribution of public subsidies for higher education to students from lower and higher income groups.

This paper examines these various aspects of the complex relationship between higher education expansion and income inequality in developing countries. To illustrate our arguments, we discuss the expansion and public financing of higher education in the BRIC countries—Brazil, Russia, India, and China. Forty percent of the world's population lives in these four countries, and their higher education enrollment has increased rapidly since 1995. Specifically, we employ the standard human capital model and empirical data from each country to illustrate how both the variation in years of education as well as the levels and variation in the rates of return to education within each country influence the relationship between education expansion and income inequality. We also estimate the fraction of public subsidies going to various income groups in each country using detailed data for the two "extreme" cases, Brazil and Russia.

We find that mass higher education expansion did not, in and of itself, appear to have decreased income inequality in the BRIC countries. In fact, our analysis suggests that higher education expansion contributed to greater income inequality in China. In the other BRICs, the effect of higher education expansion on income inequality was likely small or negligible. In none of the four countries can we conclude that the current enormous growth in the number of higher education graduates had a major positive influence on equalizing income inequality.

Our findings also indicate that students from families at different levels of the income distribution in the BRIC countries have received vastly different benefits from the public financing of higher education. In Russia, students mainly pay tuition fees in public institutions, whereas in Brazil, students pay tuition fees in private institutions. Yet, what distinguishes how Russia and Brazil distribute public benefits is not that tuition fees are paid in public versus

private institutions. Rather, the two countries differ in how students at different levels of the income distribution are allocated to publicly funded places in public institutions. The allocation of publicly funded places is much more equal in Russia than in Brazil. Although policymakers in Brazil are now introducing affirmative action programs, our analyses show that they have only a small, positive effect on making the distribution of public benefits more equal. Information on the social class of students attending higher education institutions in India and China also suggest a socially unequal distribution of public higher education funding in those two countries. The Indian distribution of public subsidies is similar to Brazil's—despite India's national affirmative action policy—and China's distribution of public subsidies appears to be more like Russia's.

2. MODELING HIGHER EDUCATION EXPANSION AND INCOME INEQUALITY

(a) The broader debate on changing income inequality

A nation's income distribution is historically related to many factors, particularly the distribution of wealth—both physical (land, physical capital) and human (education, skills). In market economies, the more equally these forms of wealth are distributed, the more likely that the fruits of production (income) will be equally distributed. Furthermore, in societies where a large proportion of wealth is owned by the State or the State is able to tax income and redistribute those taxes among various income groups through State spending, State fiscal policies can become a decisive factor in the way income is distributed (OECD, 2007, Chapter 1).

In theory, the distribution of income from employment and from labor-intensive self-employment should be closely related to the distribution of levels of education in the labor force. Early research by Simon Kuznets (1955) and Adelman and Morris (1973) proposed an "inverted U" theory of the income distribution. Kuznets argued that in very low-income societies, income is more equally distributed because most workers have very low levels of education and are

engaged in subsistence agriculture. Incomes are concentrated at low levels and that concentration dominates the distribution of income. As the level of education rises, the distribution of education becomes more unequal, agricultural societies become more urbanized, and the income distribution becomes more unequal. As the average level of education in society reaches a very high level, however, the distribution of education becomes more equal again, and the income distribution also becomes more equal. Adelman and Morris used empirical evidence to show that countries with very low levels of gross domestic product (GDP) per capita on average had smaller Gini coefficients (greater income equality) than countries with medium levels of GDP per capita. They also showed that countries with high levels of GDP per capita on average had smaller Gini coefficients than countries with medium levels of GDP per capita.

Yet, Adelman and Morris' support of the "inverted U" theory does not seem to hold for individual countries over time. For some countries, even major changes in the structure of the economy and the distribution of education in the labor force do not appear to have a large impact on changes in the income distribution. For example, Korea underwent a profound transformation from a largely rural society in the 1950s to a highly industrialized, high-income and highly educated economy in the 1990s, with little change in income distribution during that period. The slight changes that did occur in the income distribution further appear to have been more related to incomes policies (such as government pressure to hold down wage increases for professional cadres) than to changes in productivity or the distribution of education in the labor force (Nam, 1994).

Another example of a country that contradicts Kuznets' and Adelman and Morris' argument is the United States over the past 80 years. Income distribution in the U.S. first became more equal in the 1930s and 1940s. The income distribution then remained at the same level of

equality until the early 1970s, despite the fact that the distribution of education became much more equal. The income distribution then became increasingly unequal from the mid-1970s until the present, even as the distribution of education continued to become more equal (Authors, 1994). As in the Korean case, the main explanations for changing income inequality in the United States seem to have little to do with the distribution of education.

Economists have put forward alternative reasons for the rise in income inequality in developed and developing countries since the 1970s. One set of economists supports the "new technologies" argument which states that new technologies put premiums on the higher order reasoning skills associated with higher education (for example Murphy and Welch, 1989; Katz, 1999). Because the premiums on higher order skills have risen rapidly in the past generation, the income distribution has become more unequal. Another set of economists instead supports the "income policies" argument that the income distribution has become more unequal because of government income policies. These government income policies include minimum wage policies, monetary policies that kept unemployment rates higher, and trade liberalization and immigration policies—all of which reduce the relative earnings of low-wage workers (for example, Freeman, 1994; DiNardo, Fortin, and Lemieux, 1996; Farber and Western, 2002). Similarly, fiscal (taxation and spending) policies (which we consider as another form of incomes policies) have also been thought to play a major role in changing the income distribution. (OECD, 2007)

In summary, there are three main arguments for why individual nations' income distributions changed over time. The first argument is that education expansion has made the distribution of education and thus the distribution of income more equal. The second argument is that technological change has increased the returns to higher education, and that the increasing

returns to higher education have increased overall income inequality (despite an increasingly equal distribution of education in society). The third argument is that incomes policies (which incidentally can also change the return to different levels of education), have been more important in shaping the income distribution over time than education expansion or technological change.

(b) Modeling the relationship between education expansion and earnings inequality.

The discussion among economists about the changing relationship between education expansion and income inequality has, however, generally ignored two factors. One factor is the distribution of the rate of return to education within a country—namely, changes in the relative rates of return to different levels of education. The second factor is the changing amount of resources that the State invests in different levels of education. We make use of the standard human capital model to illustrate the importance of these two determinants (the distribution of the rates of return to education and the changing resources that the State invests into different levels of education) of income inequality. The human capital model can be written as follows (see De Gregorio and Lee, 1999):

$$\log Y_S = \log Y_0 + rS + e \qquad (1)$$

where Y_S = the income (Y) of an individual with S years of education;

Y_0 = the average (constant) income of individuals with no years of education;

r = the rate of return to education;

e = the error term (including other unobservable factors that influence income).

We can take the variance of both sides of the above equation to provide some intuition about the determinants of income inequality (here, the variance of the log of income). For heuristic purposes, equation (1) can be rewritten as follows (see De Gregorio and Lee, 1999):

$$\mathrm{Var}(\log Y_s) = r^2\,\mathrm{Var}(S) + S^2\,\mathrm{Var}(r) + 2rS\,\mathrm{Cov}(r,S) + \mathrm{Var}(e) \qquad (2)$$

In equation (2), the variance of the log of income in a given country $\mathrm{Var}(\log Y_s)$ is a function of the variance and (average) level of education S (in the labor force or population), the variance and (average) level of the rate of return to education r, as well as the correlation between the rate of return to education and the level of education Cov(r,S).

A number of studies have used the human capital model and cross-country data to estimate the relationship of variance of the log of income (income inequality) with years of education (the level of education) and variance in years of education (education inequality). These studies generally find that income inequality is negatively related to years of education S and positively related to the variance in years of education V(S) (see, for example, Winegarden, 1979; De Gregorio and Lee, 1999).[1] However, none of these empirical studies deals with (a) the variation in the rate of return to education, Var(r); or (b) the correlation between years of education and the rate of return to education, Cov(r,S). Another limitation of these studies is that education level is measured in years of education rather than in some other value that reflects, for example, the spending on each year of education or its quality.

There are two reasons why studies that ignore the variation in the rate of return to education or the correlation between years of education and rates of return to education can bias estimates of the relationship between education expansion and income inequality. First, the rates of return to different levels of education have generally changed over time in a way that has increased the relative value of higher education compared to lower levels of education—this is true even when the number of higher education graduates expands. Economists have typically assumed that the average rate of return falls as years of education in the labor force increases and that the variance in the rate of return remains constant. Economists have also assumed that

Cov(r,S) is negative—that is, at higher levels of education, the average rate of return to education is lower (Psacharopoulos, 1986). Yet, the evidence suggests that these relations vary from country to country, as we will show below. For example, the sign of Cov(r, S) may become positive if, as is the case in many countries (Authors, 1995; Colclough et al, 2010; Authors, 2013), an increase in the level of education is associated with the rate of return to higher education becoming higher than the rate of return to secondary education.

The second reason is that even if the rate of return were constant over different levels of education, measuring S by average years of education in the labor force does not reflect differences in the "quality" of education (a) across countries; (b) within a country over time; or (c) across levels of education within a country at a single point in time. It is likely that quality of schooling negatively correlated with Var(Y),and since S is negatively correlated with Var(Y)., Thus, omitting a measure of the quality of education probably biases upward the contribution of education to income inequality in the traditional studies that use cross-country data.[2] For example, assume that higher spending per student reflects a higher quality of education.[3] Further, assume that high income inequality countries generally spend less (public and private contributions) per student on education in PPP$ than low inequality countries and have lower average scores on international tests than low inequality countries (Adamson, 2010). This suggests that the (negative) coefficient of S estimated in Equation 2 above should be smaller (less negative) than international studies suggest. In addition, higher inequality countries tend to spend more per student on higher education relative to primary and secondary education (variation in quality is positively correlated with Var(Y) and with Var(S) and Var(S) is positively correlated with Var(Y)), suggesting that the positive coefficient of Var(S) (the inequality in

education) on Var (Y) usually estimated by typical international cross-sectional studies is also biased upward.

3. HIGHER EDUCATION EXPANSION AND INCOME INEQUALITY IN THE BRICS

Tables 1, 2, and 3 summarize the estimated changes in the BRIC countries for the key variables in Equation 2. Table 1 shows changes in income inequality from 1980 to 2008, as measured by the Gini coefficient. Table 2 shows the average years of education as well as the standard deviation of years of education in the labor force from 1980 to 2008. Table 3 shows the private rates of return to both secondary and higher education for selected years over much of the same time period.[4]

According to Table 1, income inequality varies substantially across countries and, in some cases, over time. The income distribution is most unequal in Brazil (a higher Gini coefficient), but is gradually becoming more equal. The income distribution is most equal in India, but is gradually becoming more unequal. China has a higher level of inequality than in India, but this appears to be leveling off due to government spending in rural areas and greater increases in the wages of lower compared to higher skilled labor (which in turn is due to a growing shortage of cheap rural labor in the country – Cai et al., 2008). According to the data shown in Table 1, Russia's income distribution changed drastically towards greater inequality in the early 1990s when the transformation from the command economy occurred. Russia's income distribution became more equal again in the early 2000s and is now gradually becoming more unequal.

What is the likely contribution of education expansion (as measured by years of education in each country's labor force) to income inequality? Table 4 summarizes how the various terms on the right side of Equation 2 (as summarized in Tables 2 and 3) have changed

over three decades.[5] Table 4 suggests that, in all four countries, the positive change in the covariance term, Cov(r,S)—which in part reflects the relative increase in the return to higher education (compared to the return to lower levels of education) as higher education expanded—contributed to greater income inequality.

Besides the positive change in the covariance term, Cov(r,S), higher education expansion and the associated change in the rates of return to education also seemed to maintain or increase income *inequality*. In Brazil, the increase in the variance of the rate of return to education times the rising average level of education contributed to increased income inequality. However, the falling average rate of return to education (driven by the declining rate of return to secondary education), combined with the increased variance in years of education in the labor force, helped decrease income inequality. In China, the rate of return to education and the increase in the years of education in the labor force especially contributed to increased income inequality. In India, only the covariance component seemed to contribute to greater inequality. Inequality in India probably increased due to factors outside the rapid rise of education levels in the labor force. Finally, in Russia, it appears that education expansion contributed in a small way to increased income inequality, despite small changes in the rates of return to education. In Russia, as in India, the main change in income inequality probably was due to other unobserved factors.

[Tables 1, 2, and 3 about here]

As noted, we may be overestimating or underestimating the impact of the education expansion (the increase in S) in a given country because education quality may be decreasing (for example, possibly in India) or increasing (for example, probably in Brazil).[6] In theory, changes in education quality should be reflected in changes in the rate of return to education, but they may not be. Wages may increase less rapidly than the productivity of graduates (the US

labor market in the past twenty years is a good example). Thus, an increase in the quality of education invested in the labor force should increase labor productivity, but if wages do not rise with higher productivity, the increase in quality will not be reflected in a rising rate of return to education. If, for example, S does not reflect increasing educational quality in Brazil (e.g. as reflected in higher international test scores), the increase in S multiplied times the variance in the rate of return would underestimate the impact of education expansion on inequality. However, if the increase in quality comes largely from increasing the quality of lower performing students, not including a quality index would imply that we are overestimating the variance of S, hence would reduce the contribution of that component to income inequality.

Biases in the measure of education aside, an important lesson from the exercise in Table 4 is that increases in the variance of the rate of return to education (as reflected in the rise in the rates of return to higher education relative to secondary education) summarized in Table 3, can have an important influence on income inequality. This is accentuated when average rates of return are rising over time as in China. The potential contribution to income inequality of increasing variation in the rates of return to education (i.e. increasing rates of return to higher education relative to secondary education) in the face of education expansion reflects an inescapable logic. Higher educated labor can be and is substituted for less educated labor as the education system expands. If this downward substitution helps raise the return to the highest level of education relative to the return to secondary education, the expansion of average education in the labor force increasingly favors those at the top of income ladder. This is what we have observed in all four BRIC economies. However, if this continued school expansion contributes to drive down the *average* rate of return to education (r), as it seems to have done in Brazil, at least one component of Equation 2 – r^2Var (S) – may help push down income

inequality.

[Table 4 about here]

4. INCREASINGLY DIFFERENTIATED SPENDING ON ELITE AND MASS HIGHER EDUCATION

The conventional wisdom is that in countries with relatively high rates of return to higher education, expanding higher education should lower the return to those who complete higher education and should contribute to less income inequality. But if there is large variation in how much is spent on students attending different kinds of higher education institutions, and institutions with high spending per student expand much more slowly than institutions with low spending per student, even if the rate of return to attending one or another of these institutions is *initially* similar, the income distribution could become more unequal as more students enter and complete higher education. The income distribution could become more unequal because the rates of return to attending institutions with low spending per student would decline relative to the rates of return to attending institutions with high spending per student. This trend would further be exacerbated if average spending per student (and implicitly the quality) declined faster in the mass institutions that absorbed a high proportion of the increase in higher education enrollments compared to elite institutions.[7]

In another study, we have shown that the gap in spending per student is becoming larger between elite and mass higher education institutions in Brazil, China, and Russia (Authors, 2013). The gap is growing in China and Russia because elite institutions are receiving increasingly more funding from the government than publicly funded mass institutions. The gap is growing in Brazil because the mass private institutions are spending less per student, on average, as the private system expands. If *the increasing gap in spending per student* between

elite and mass higher education institutions is a dominant trend in the developing countries, even as higher education enrollment expands, the overall rate of return to completing higher education can hold constant or rises (perhaps mainly from declining earnings to high school completers and those who do not complete higher education). However, the absolute *return* (not the *rate* of return) would rise differentially for those who attend different tiers of institutions. Under certain circumstances, this could contribute to greater income inequality even as the higher educated labor force increases rapidly.

We can test the possible effect of this increasing gap in spending in terms of the components in Table 4. If for the sake of argument, we assume that the rates of return to students graduating from different types of higher education institutions were essentially equal,[8] and we were to account for the increasingly differentiated spending per student (hence allegedly increasingly differentiated quality) on elite and mass institutions, we could find a potentially larger than observed variance in S (measured only in years of education), once we weighted those with a completed higher education by spending per student. In Brazil, average rates of return appear to be falling. This should contribute to decreased income inequality through the first term of Equation 2. In China, because r is increasing, this increased differentiation probably contributes even more to income inequality than not accounting for the increased spending differentiation in elite and mass institutions. Again, the lesson we discussed above is crucial: if expanding the level of education in the labor force is accompanied by falling rates of return to education, education expansion contributes to greater income *equality*. However, if expanding the level of education is accompanied by rising rates of return, as we have seen in China, then expanding education increases income *inequality.*

This does not settle the larger issue of why the rate of return to education increases (and also, possibly, the variance in the rates of return) as education levels in the labor force increase. Is it the result of exogenous technological change or State incomes policies or major changes in the organization of the economy, such as the transition from State to market capitalism in Russia and China? In any of these cases, national States can play an important role in offsetting increased income inequality. They can keep increasing education levels and improving educational quality, especially for disadvantaged young people, and hope that this eventually drives down the average return to higher education. They can also use State fiscal (tax and spending) policies to equalize post-tax, post-spending income, or invest in less-developed regions (as in China), all possible ways for State policies to contribute to income equality.

5. THE DISTRIBUTIONAL CONSEQUENCES OF BRIC HIGHER EDUCATION FINANCING SYSTEMS

Before discussing the distributional consequences of each BRIC country's policies for financing higher education, we make an overarching observation about all four countries. That is, when the cost of higher education is borne largely by the State, as it has been in all four countries except Brazil, the main beneficiaries of State financing are high-income students. High-income students benefit more from State financing than low-income students because they are much more likely to attend higher education When higher education is increasingly differentiated into elite and mass institutions with higher and lower spending per student—as it has been in all four countries—high-income students are also more likely to attend the elite institutions which spend more per student (Hansen and Weisbrod, 1969; Tilak, 1989). Higher spending per student combined with government policies that keep tuition fees low at elite institutions results in high-income students receiving higher levels of public subsidies than low-income students. Of course,

the families of high-income students are also more likely to pay higher taxes, and it could therefore be argued that they are entitled to more and better public services (see Pechman, 1970; Barbaro, 2004).

The unequal access between high and low-income students characterizes the higher education systems of each BRIC country (indeed, in virtually all the higher education systems in the world). Yet, the situation is more extreme in Brazil and India. Despite the considerable expansion of higher education in recent years and even the existence of affirmative action in Brazil and India, students from low-income families attend higher education in limited numbers. As a consequence, little of the State's subsidy for higher education reaches low-income groups in these two countries. The situation is improving significantly over the last several years, particularly in India.[9]

In the next few sections, we support the above claims by examining the empirical evidence from each BRIC country separately.

(a) Brazil

Data on the (family) income of higher education students enrolled in private and public institutions in Brazil allow us to estimate public subsidies for students in different income categories (see Table 5). Estimates from Table 5 assume that high and low-income students in public institutions enter fields of study that spend the same amount per student. This is probably not the case. It is much more likely that within the same institutions, high-income students enter fields of study that spend more per student than do low-income students. Thus, among students who enter public institutions, high-income students receive higher subsidies than low-income students.

In Brazil, the highest income students end up receiving a small subsidy *per student* while the lowest income students end up receiving a large subsidy *per student*. Even when we assume that public subsidies are the same among all students who attend higher education, high-income students are more likely than low-income students to enroll in private institutions which charge high tuition fees. That is, such a high fraction of all higher income students enrolls in private higher education (about 75% of the top quintile SES group in both 2002 and 2007) that despite the fact that the same group dominates enrollment in public higher education, that group ends up receiving a lower net subsidy per student enrolled in higher education. At the other end of the spectrum, about one half of the lowest 40% income group enrolled in private higher education in 2002 and 64% in 2007. Thus, a low-income student in Brazil who attended higher education received a higher public subsidy (on average) than a high-income student who attended higher education (see Figure 1).

The other point made by the estimates in Table 5 and also by Figure 1 is that because of the rapid expansion of the private higher education sector in Brazil and the corresponding gradual shift to incorporating more low-income students in private institutions, the net subsidy to low-income students tended to fall much more than to high-income students between 2002 and 2007. The overall picture is that the expansion of the private sector and the need to attract more (low-income) students through lowering the real price of enrollment has reduced the net subsidy received per student in low relative to high-income groups.

[Table 5 about here]

[Figure 1 about here]

At the same time, the proportion of the *total subsidy* for those enrolled in public institutions has become somewhat more equalized among different income groups. In 2002,

students from the top income decile got 35% of the total subsidy provided to public higher education students. In 2007, this dropped to 30%. Again, this calculation assumes that low-income students were in the same fields of study in terms of average spending per student as high-income students. It is likely, however, that high-income students were in fields with higher spending per student and therefore had a higher fraction of the total subsidy. Students from families in the bottom 40% of the income distribution were the beneficiaries of 7% of the total subsidy in 2002 and 13% in 2007 (Figure 2).

The Brazilian government spends a high fraction of its higher education budget on high-income students in Brazil. At the same time, high-income students are even more likely to attend private institutions. Therefore, high-income students receive a lower subsidy *per student* in higher education than low-income students. The government could therefore argue that even though it heavily subsidizes the rich with its tuition-free public higher education, its policy of allowing higher education enrollment to expand primarily through the growth of tuition charging private institutions ends up primarily taxing the rich and subsidizing the poor, although this type of taxation does reduce the fraction of low-income students who can afford to attend university.

[Figure 2 about here]

The Brazilian government can further make the case that the rich also pay more taxes. That is also partly correct. One estimate of the distribution of the total tax burden (direct income taxes and all indirect taxes) by income group in Brazil showed that 40% of the tax burden was borne by the highest decile income group, 16% by the next decile, 11% by the 8th decile, 9% by the 7th decile, and so on down to 2% by the bottom decile (Baer and Fialho Galvao Jr., 2005, Table 7). If we include these tax burden data in our estimates, it suggests that the top decile of income earners got less in benefits (30%) in 2007 than the proportion of taxes paid (40%), but

the 9th decile and the 4th quintile got a greater benefit from higher education subsidies—20% and 24%, respectfully—than taxes paid—16% and 20% of total government tax revenue, respectively. The bottom 40% of income earning families, even with an active affirmative action policy in public institutions got slightly less benefits than taxes paid (12.7% versus 13%). All this suggests that at the very top, Brazil's higher education financing policy is progressive (assuming that youth from the highest earning 10% of families do not specialize in the most expensive courses of study in public institutions), but becomes regressive for families below that top decile (high-income students get more proportionately more benefits than taxes paid).

The growth of private mass higher education in the past seven or eight years has relied on low tuition prices that attract large numbers of low-income students. The net effect of falling tuition (adjusted for inflation) and the incorporation of more low-income students into private institutions has been a much more rapid fall in the net subsidy per student for low-income students than for high-income students (see Figure 1). The response of the private sector has been to lobby for government-backed student loans and the response of the government has been to push for subsidizing the private sector directly to admit low-income students under affirmative action.

(b) India

We do not have similar data for India on the distribution of spending and taxes as we do for Brazil. However, our survey of 7,000 final year engineering and computer science students in almost 40 Indian technical colleges and universities (Authors, 2013) gives us some insight into who benefits more from higher education places with lower spending per student, and how much this benefit is worth. Further, a survey from 2004-05 that estimates the gross enrollment rates in India's colleges and universities by income quintile (UGC, 2011, Table 5.06) shows that despite

a major affirmative action effort, a very unequal distribution of enrollment among young people from low and high-income groups. Based on those figures, students from families in the bottom 40% of the income distribution represent about 11% of students enrolled, and students from families in the top income quintile were 58% of those enrolled in 2004-2005. This breakdown is very similar to the proportions in Brazil in 2007 (Table 5). Since the gross enrollment rate in India increased from 14 to 18% in 2008-2010 (using 18-22 year olds as the reference group), the proportion coming from low-income groups should also have increased (as it also almost certainly did in Brazil because of a similar expansion since 2007).

Thus, Indian higher education shares two important features with higher education in Brazil: a very high fraction of students in Indian and Brazilian higher education come from relatively well-off and highly educated families, and the State in both systems has implemented affirmative action programs. In India, this initiative is large, mandatory, and comes directly from the Central State (Weisskopf, 2004). In Brazil, until recent (2012) legislation was signed into law mandating quotas for disadvantaged minorities in federal universities, the program was voluntary, was up to individual public institutions, which shaped the program in varying ways according to each institution's preferences, and was made available by the federal government to private institutions through a federal scholarship incentive program (see for example, Fermin and Assunção, 2005).

Our results from the student survey of engineering students show that male, high-income students and students with higher entrance exam scores are more likely to attend lower tuition, more prestigious public institutions. Thus, they are likely to be more subsidized than students in the middle of the income distribution. On the other hand, because of affirmative action, students (to the extent that disadvantaged castes are low income) are also likely to be subsidized

regardless of whether they attend public or private institutions.

In our survey of engineering and computer science students, we were able to estimate tuition fees as a function of caste, college entrance exam scores, and type of college. Our results suggest that, indeed, students with higher exam scores and those from disadvantaged castes pay lower tuition. The latter pay even lower tuition when their exam scores are higher. Higher socioeconomic background students, where socioeconomic background is measured by mother's and father's education, pay higher tuition. As expected, controlling for the caste and entrance exam scores, those students attending private institutions pay higher fees. These results also suggest that government affirmative action policies do result in disadvantaged castes paying less to take engineering education, and do result in higher income students paying higher fees (even when controlling for caste and exam score). It appears, therefore, that from an equity standpoint, government policy regarding lower caste access at lower fees does offset at least part of the advantage going to higher social class students in terms of their likely scoring higher on entrance exams. A ten percentage point higher entrance exam score is associated with Rs. 5,000 less tuition, but disadvantaged castes pay about Rs. 20,000 less, on average, with the most disadvantaged paying about Rs. 30 thousand less.[10]

In sum, the current financing of the Indian higher education system seems to be generally efficient (those who pay the highest fees, on average, are in the fields that have the highest private returns), and generally provides for considerable equity—some say too much equity (Kochar, 2010)—except at the upper end of the test score distribution, where the government heavily subsidizes very high scoring (and generally very high social class) students to attend highly selective technical (IITs), business/public management (IIMs), and other institutions, such as the Delhi School of Economics. The size of this subsidy is large—at least $3,500 per

student, and perhaps as much as $7,500-8,000. But a much higher fraction of higher social class students in engineering fields pays high fees to attend college, and a substantial proportion of student in colleges and universities come from relatively modest backgrounds. They too are subsidized, to the tune of about $500-$1,000 per student (in 2009).

(c) Russia

More than any of the BRICs, Russia has made higher education available to students across the social class spectrum. This resulted first from the long-term expansion of the Soviet higher education system, which increased even further after the creation of the Russian Federation in 1991 and now enrolls about 85% of the age group. Second, it results from years of a highly equal income distribution during the Communist era. That distribution has become much more unequal in the past 20 years, but because of the expansion in higher education, the distribution of access to higher education spots is now much more equal than income.

Russia's higher education institutions achieved their large increases in enrollment in the past two decades mainly by allowing public institutions to charge tuition fees to students who did not qualify for "budgeted" or "free" places. These fee-paying students now represent more than half of the total of students in public institutions. In addition, about 17% of students attend small (in terms of enrollment) private institutions. Many analysts believe that it is mainly low-income students who pay fees to attend public institutions and who attend private institutions, which are much lower in quality than the publics. The argument is that high-income students are likely to attend better primary and secondary schools and have more resources at home to prepare for college entrance exams. However, despite this logic and, as in Brazil, low- income students appear less likely than high-income students to pay fees to attend higher education. We have no data on the social backgrounds of students in private institutions, but we do have detailed

information on the average fees paid by students from families with different levels of monthly income. Average fees paid by students who pay fees increase as students' family income increases and so does the proportion of students paying fees (Table 6). The pattern suggests that high-income students either are more likely to pay for places at institutions or attend institutions/programs that charge much higher fees. This is a logical outcome, since high-income students are probably less likely to be willing to accept a budgeted place in a less prestigious program (such as engineering) and would opt to pay to enter a more prestigious program or a more prestigious institution. Further, as survey we made of final year engineering students suggests, many students in urban areas (few of whom are from low-income families), have parents with at least some higher education (Authors, 2013)

[Table 6 about here]

Based on data showing the distribution of students by "per member family income" and of the average fees paid by students from different family income backgrounds to attend public institutions, we can estimate the distribution of State subsidies among students coming from low and high-income backgrounds. These estimates show that the average subsidy per student declines as student family income rises (Table 7). This is consistent with our estimates in Brazil. In the Russian case, we assumed that the spending per student in the institutions attended by high-income students is somewhat higher—that is, we assume that they are more likely to attend institutions in the main cities and to attend an elite institution (Table 7). Furthermore, unlike our Brazil data, where we had to assume that high-income students pay the same amount in fees as low-income students, in Russia we have estimates from the household survey of actual fees paid by students from each income group.

In Figure 3, we estimate the total public subsidy going to students from each quintile of *per family member* income distribution. Overall family income distribution is reported, but we only have the distribution of students based on per family member income. The main takeaway from Table 7 and Figure 3 is that the distribution of total subsidies for the 92% of Russian students attending public institutions (non-paying and paying) is more equal than in Brazil, even though high-income students get a high fraction of total subsidies paid out, just as in Brazil. In Russia, students coming from families in the bottom 40% of the income distribution received 26% of the public subsidies for higher education in 2010, twice the percent for that income group in Brazil. The fourth quintile and the 81-90% decile get less than in Brazil, but the top decile in Russia in 2010 got a somewhat higher proportion of the total than in Brazil on 2007. Students from the top 20% in Russia get 45% of subsidies, only somewhat less than the 50% in Brazil.

[Table 7 about here]

Other analysts have stressed the unequal access to higher education in the Soviet Union and post-Soviet Russia (Shavit et al, 2007), but in comparison to the other BRICS, not only is access more equal, but so is how much low and high-income families get in the form of public subsidies. As we have argued, this is influenced by the fact that so many young Russians go to higher education, and that the spending on tuition increases with students' family income. We have, of course, assumed a certain degree of equality in the spending per student in the public institutions attended by the poor and rich in Russia. This almost certainly underestimates the public subsidy received by students from high-income families, particularly in the last several years when public spending on elite institutions rose sharply.

[Figure 3 about here]

The Russian case illustrates a higher education system in which initial conditions of relatively high levels of parents' education and relatively equal income distribution combined with considerable expansion of the system to produce apparently somewhat greater equality in the distribution of public resources than in the other BRICs. Further, this has taken place without the benefit of affirmative action policies, in part because under these conditions, the number of families pressing for affirmative action is relatively small.

(d) China

As in the case of India, we do not have data for China on the distribution of public spending on higher education by income groups, so can only draw approximate inferences from more general evidence on who attends higher education in China and the differential public spending on different types of institutions. All higher education students in China pay tuition fees. Tuition fees do not vary greatly among different public institutions but are considerably higher in private institutions (about 20 percent of Chinese students now attend private institutions).

Authors (2011) examined administrative data from 2001-2010 on all students who took the college entrance exam in one northwest province in China. They show that while the proportion of rural students taking the college entrance exam in this province has increased over the last ten years, the proportion gaining admissions into various levels of higher education has stayed low and relatively constant over the decade. In addition, by 2010, the percentage of rural students taking the college entrance exam was higher than the percentage of rural students gaining admissions into higher education, which in turn was higher than the percentage entering selective tiers of higher education. These phenomena were reflected in the fact that rural students

performed less well than urban students on the college entrance exam, especially at higher ends of the score distribution.

Beyond the urban-rural gap, disparities also exist between more and less-economically developed counties even within a single province. On the one hand, college entrance exam attendance as well as higher education and selective institution admissions rates increased markedly over the last ten years for students in both poor and non-poor counties—moving in parallel with higher education expansion. However, even by 2010, students from poor counties were much less likely than students from non-poor counties to attend the high school entrance exam, high school or elite high schools. Relatedly thus, students from poor counties were much less represented in the entrance exam, higher education in general, and selective institutions. More specifically, in 2010, students in non-poor counties were 70% more likely to be admitted to tier 1 and 2 institutions and 63% more likely to be admitted into elite institutions than students in poor-counties (Authors, 2011).

Author (2009) uses another simple random sample of senior students from over 40 institutions in Shaanxi in 2008 to analyze the breakdown of students from different backgrounds in the Chinese four-year institutions.[11] In particular, he finds that individuals in the first tier (especially those in elite first-tier institutions) are of a somewhat higher socioeconomic background (as measured both by rural versus urban residential status as well as by an asset-based measure of socioeconomic status) than those in the second tier and both are of a lower socioeconomic background than students in the third tier. This validates the notion that students from more advantaged families enter better institutions (from which they may potentially earn higher returns in the long-term) as well as private four-year institutions which charge high tuition fees.

We now turn to the issue of how Chinese students from different backgrounds are subsidized across the higher education system. Elite institutions in China spend much more per student than non-elite institutions and there are even substantial differences between different levels of elite institutions (Authors, 2013). The central government also tightly controls tuition list prices and related tuition fees across tiers—although these vary across different provinces and different institutions, and can differ across majors even within the same institution, the differences are not great among public institutions. Thus, tuition fees tend to cover a much higher proportion of total spending per student in lower tier than in higher tier institutions.

Since elite institutions have relatively low tuition prices and yet spend much more per student (especially at the most elite institutions), on the whole lower social class students receive a much smaller subsidy per student than higher social class students.[12] The gap in subsidies between higher and lower class students are also potentially increasing, given the increasingly differential spending in 2000s between elite and non-elite institutions and the fact that tuition rates have stayed the same over the last several years. Furthermore, while it is true that the Chinese government has paid considerable attention to ameliorating the economic burden of affording higher education for disadvantaged families by greatly increasing the amount of targeted financial assistance since 2007, the allocation of total aid does not change the overall pattern of tuition prices that students face across tiers (Author et al., 2012b). That is, the current distribution of financial aid combined with the tuition fee structure maintains an implicit advantage for first-tier over lower-tier students. Students in third-tier institutions also seem to bear a disproportionate burden (in terms of prices relative to their level of SES) compared to students in other tiers.[13]

Tuition fees, net of financial aid, likely keep a substantial percentage of lower social class students from attending the third tier of private, four-year institutions. The substantial fees also create a situation where high school seniors from disadvantaged backgrounds have to score much higher on the college entrance exam in order to qualify for a four-year institution that they can afford. This is indicated by the fact that higher socioeconomic background and urban students are more likely to attend local third-tier (private) institutions than lower socioeconomic background and rural students even after controlling for college entrance exam scores (Author 2009; Authors, 2011). Furthermore, since exam scores are correlated with socioeconomic background, lower social class and rural students probably score more within the third-tier range (proportionally) than higher social class and urban students.

In addition, unequal spending per student across more and less economically developed provinces, combined with other important differences between provinces (including the fact that four-year and selective institution quotas are allocated more to economically developed provinces, something we discuss further below), further affect the degree to which students from different backgrounds are subsidized across the higher education system. For example, since high social class students are likely to be in Beijing, Shanghai, or developed coastal provinces and attend more elite institutions with higher spending per student than students from the interior of China, the public subsidies for high social class students will be higher than low social class students even in non-elite (public) institutions. This is only partially offset by the fact that students from more economically developed areas have to pay higher tuition rates on average than students from less economically developed areas.

6. CONCLUSIONS

Mass higher education expansion in all the BRIC countries has contributed to higher levels of educational attainment and has greatly increased the supply of higher education graduates. From one perspective, higher education expansion should have increased educational and economic mobility for lower social class students and reduced income inequality in the population as a whole.

Several factors have worked against the trend of more equal opportunities and incomes. These countervailing factors include (a) the rising rates of return to higher education, often driven by rapid economic growth, as in China; (b) the rising rates of return to higher education relative to the falling rates of return to secondary education, as in Brazil, India, and Russia; and (c) the increase in spending by government on elite institutions relative to mass institutions. These factors have tended to lower the economic mobility of students from lower social class groups (even those attending higher education) and increase income inequality.

Such tendencies are crystalized in the degree of public subsidies that the government pays to various social class groups that attend higher education. Students from the highest income families as well as a very small group of high ability students from disadvantaged families get the lion's share of public subsidies to attend higher education because they tend to study in higher education institutions which spend a lot per student and pay about the same fees for their studies as students in less expensive mass institutions. Only Russia appears to be somewhat of an exception to this rule.

Students from the highest income families also tend to pay a higher proportion of taxes, so they bear a higher fraction of the costs of running government, including supporting public higher education. In Brazil, our estimates suggest, however, that except for the highest income decile families, the balance between government subsidies and taxes paid benefits high-income

families more than low-income families. We were not able to estimate the benefit-cost differences for the other BRICs.

Thus, access to higher education is still fairly restricted to children from higher educated, higher income families in all but Russia. In addition, the BRIC States tend to provide greater indirect support for the education of students from high-income families, since such students are likely to attend public institutions with no or low tuition and elite institutions receiving higher levels of State subsidies. But in India and, to a much lesser extent in Brazil, the State also supports a sizeable number of disadvantaged students, offering at least some offset to bias in favor of subsidizing children from higher income backgrounds.

Under these conditions, we conclude that the expansion of higher education in the BRICs has at best contributed little to greater income equality. The returns to higher education did not fall even with the substantial increase in the proportion of the labor force that completed higher education. If anything, because of rapidly increasing demand for higher skills or because of even more rapid increases in secondary school graduates in the labor force, the relative incomes of higher education graduates rose in this period. Further, increasing differentiation within the higher education sector appears to have benefited those from higher social class groups with greater subsidies (hence increasing their private rates of return) relative to the relatively much smaller percentage of students coming from lower income groups.

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Endnotes

[1] Ram (1989; 1990), however, finds that S and Var (S) are not significantly related to income inequality.

[2] It is possible that quality in the form of value added to student learning is negatively correlated with S, which could bias the estimate in the opposite direction, but we have no evidence of such a negative correlation.

[3] Note that some analysts argue that educational spending per pupil is not a good indicator of the quality of education, since much of the money used in education goes to teacher salaries, and higher salaries does not necessarily result in higher quality teaching (see, for example, Fuchs and Woessman, 2007).

[4] Because of data limitations, in the case of Russia we present estimated rates of return for professional (instead of secondary) and higher education.

[5] We approximated the change in Var(r) by comparing the trend in the rates of return between secondary and higher education (or the trend in the rates of return between professional and higher education in the case of Russia—see Table 3). We also used information about the rates of return and schooling levels to determine the sign of the Cov(r, S). The sign is negative when the rate of return to secondary education is higher than the rate of return to higher education and positive when the rate of return to higher education is higher than that of secondary education. In all but Brazil, secondary education used to have a higher return than higher education, but this trend either disappeared (India) or reversed itself (China, Russia). Thus, the change in the covariance is positive for India, China, and Russia. In Brazil, the covariance becomes increasingly positive over time.

[6] We have no evidence on how international test scores are changing in China or India. China participated for the first time in an international test in 2009. India only participated in an assessment in two states in 2009. However, we do have test scores for Russia over a 12-year period on the TIMSS and 9 years on the PISA. The mathematics scores in Russia show some decline in the late 1990s on the TIMSS, but no significant change on the PISA. Brazil, by contrast, made significant improvements (beginning at a very low level) in mathematics on the PISA since 2000. Therefore, from an output standpoint, the very modest increase in the average years of education in the Russian labor force since 2000 may be a good representation of S in Equations 1 and 2, whereas in Brazil, the greater increase in years of education in the last ten years is likely to be an underestimate of the "true" increase in S, were we to adjust those years for "quality."

[7] It is also possible that along with higher education expansion, students from higher income families are increasingly sorted into elite institutions while students from low-income families are increasingly sorted into non-elite institutions. Correspondingly, as higher education enrollment expands, the difference in "ability" of students entering increasingly higher cost elite institutions could be increasing relative to the "ability" of students being sorted into lower cost institutions. Unless the estimated rate of return to schooling is corrected for selection bias, this could also contribute to greater income inequality.

[8] It could be argued that the rate of return to graduating from lower tiers is lower because the quality of education in lower tier institutions is lower, but we could argue that the rate of return per dollar spent per student is the same in lower tier institutions, and that lower quality (hence absolute return to students) is reflected in lower spending.

[9] Contrast the present situation with the late 1970s (Dasgupta and Tilak, 1983).

[10] Interested readers can obtain these regression estimates as well as those estimating students' expected earnings from the authors.

[11] It is important to examine within-province higher educational inequality in China as each province has its own separate application and admissions system (see below). Although we do not have data from each province, we arguably have the best data on this topic so far in China (i.e. either randomly sampled or administrative data covering all students of the related population). Using data from these two northwest provinces likely provides an upper bound on inequality within provinces in China.

[12] Here we again assume that high social class students enter the same fields of study (in terms of spending per student) as low social class students; in fact in tuition prices are fairly similar between most majors within a given institution in China.

[13] In Shaanxi specifically, we find that the net tuition prices (tuition and dorm fees net of non-loan financial aid) of going to a first-tier institution comprise only about 40% of the annual per capita disposable income of urban households as compared to 160% for rural households. The average net tuition fees of going to a third-tier institution is roughly 90% of annual per capita disposable income for urban households compared to a formidable 360% for rural households (see Author, 2009).

Figures

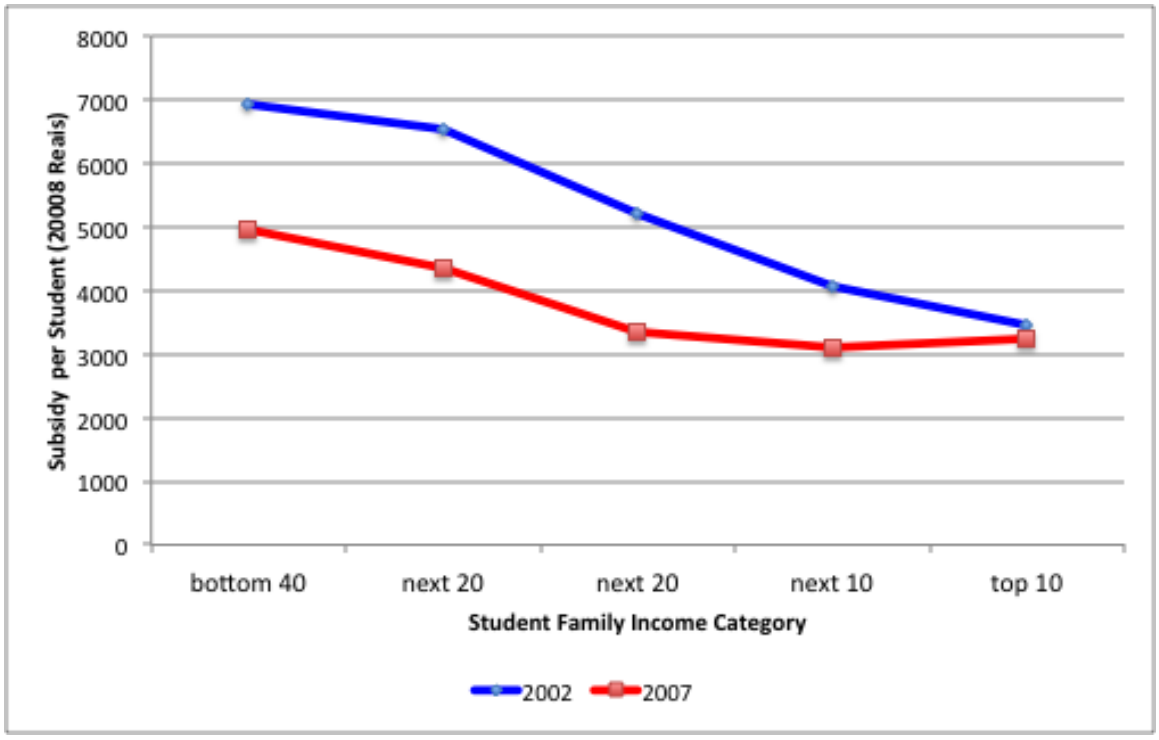

Figure 1. *Brazil: Public Spending on Higher Education per Student, by* ***Student's*** *Family Income Category, 2002 and 2007 (2008 Reais)*

Source: Table 5.

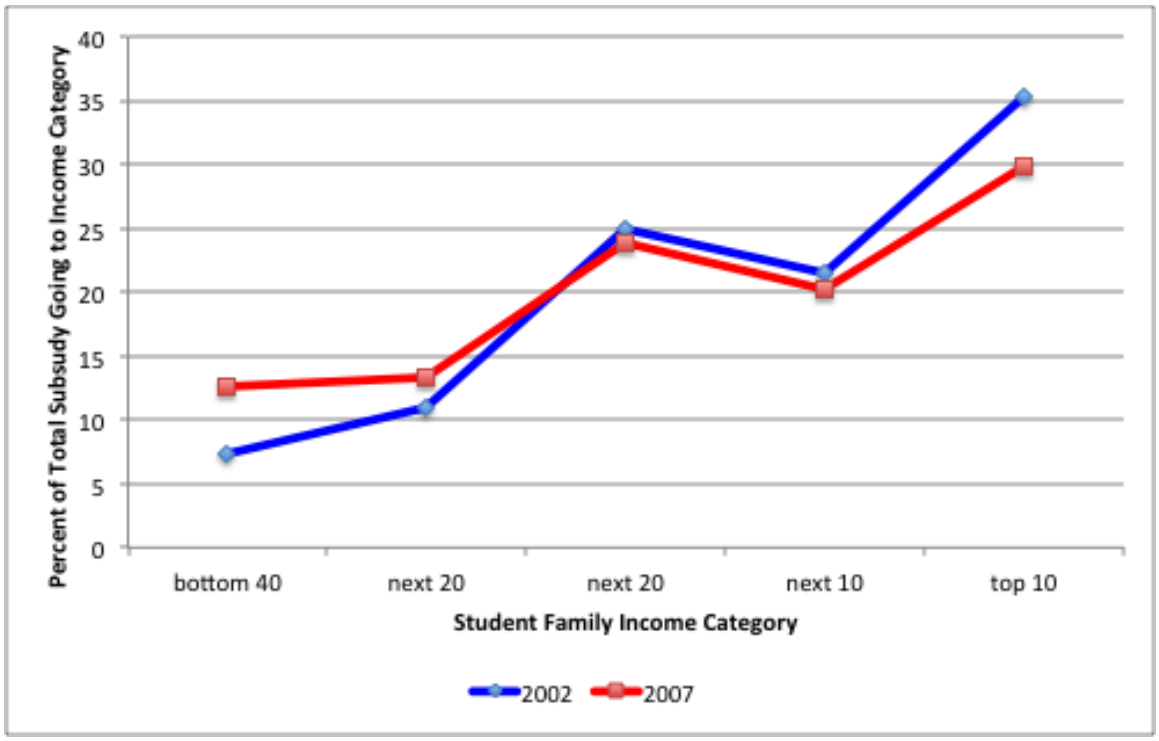

Figure 2. *Brazil: Distribution of Total Public Subsidy on Higher Education by* ***Students' Family Income Category, 2002 and 2007 (percent).***

Source: Table 5.

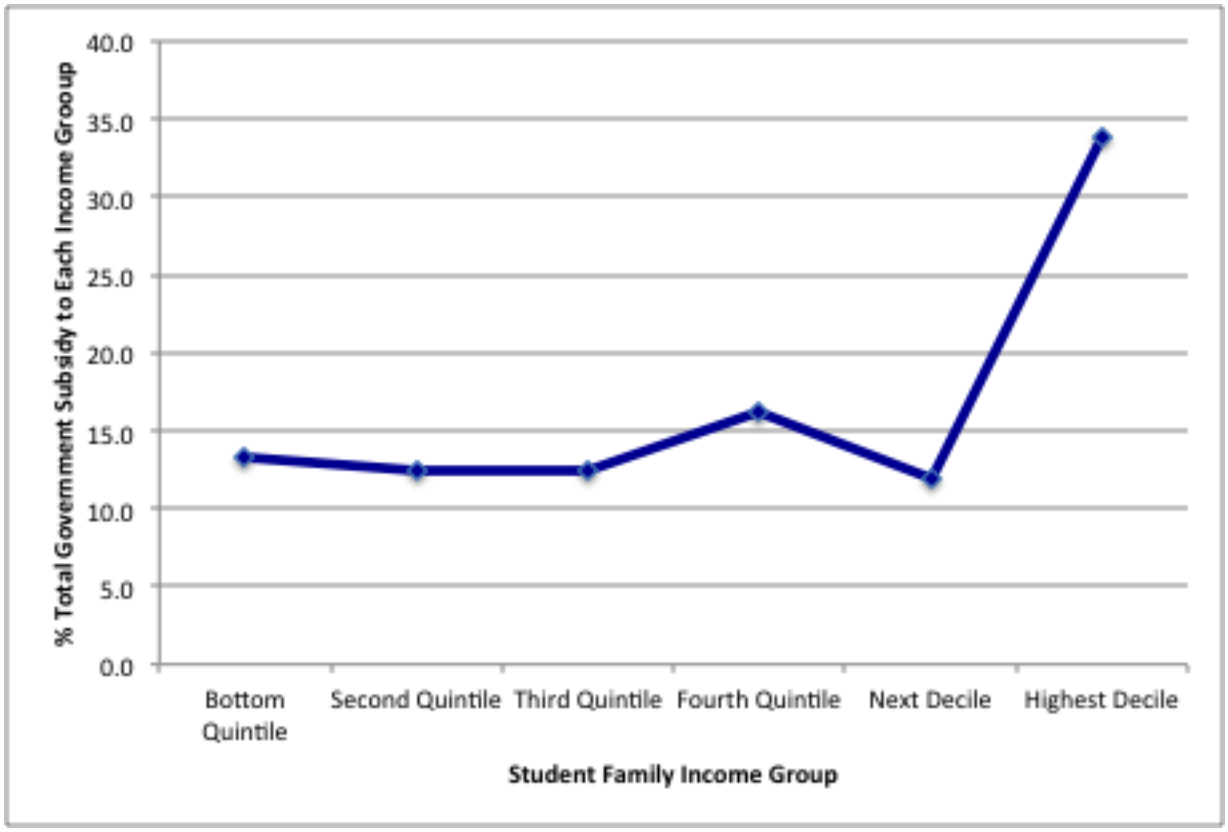

Figure 3. *Russia: Distribution of Total Public Subsidy on Higher Education by* ***Students' Family Income*** *Category, 2010*

Source: Table 7 and Author's calculation using Russian income distribution data from Russia Longitudinal Monitoring survey, RLMS-HSE, conducted by the National Research University Higher School of Economics.

Table(s)

Tables

Table 1. *BRIC Countries: Income Distribution, 1980-2008 (Gini Coefficient X 100)*

Country	*1980-85*	*1986-90*	*1991-95*	*1996-2000*	*2001-03*	*2005*	*2008*
Brazil	58	61	60	59	58	56	55
China	30	32	38	40		42	
India	32	31	32			37	
Russia		24	48	43	38	38	42

Source: Deininger and Squire, 1996. World Bank, *World Development Indicators*.

Table 2. *BRIC Countries: Average Years of Education in the Labor Force and Standard Deviation of Years of Education, 1980-2008 (years)*

	Average Number of Years of Education in Labor Force						
Country	*1980*	*1985*	*1990*	*1995*	*2000*	*2005*	*2008*
Brazil	3.41	3.64	4.03	4.32	4.63	4.93	5.11
China	4.76	4.95	5.84	6.10	6.36	6.66	6.84
India	3.29	3.63	4.11	4.53	5.06	5.53	5.80
Russia				9.77	10.04	10.31	10.58
	Standard Deviation of Years of Education in Labor Force						
Country	*1980*	*1985*	*1990*	*1995*	*2000*	*2005*	*2008*
Brazil	3.41	3.56	3.65	3.73	3.87	4.02	4.10
China	4.36	4.37	4.36	4.36	4.34	4.42	4.44
India	5.15	5.24	5.35	5.44	5.44	5.44	5.44
Russia				3.34	3.42	3.50	3.50

Source: Fan, 2005. Also see Thomas et al, 2003.

Table 3. *BRIC Countries: Private Rates of Return to Secondary and Higher Education, 1980s to 2008 (percent per year of education).*

Country/Level of Education	*1980*	*1990*	*1995*	*2000*	*2005*	*2008*
Brazil Secondary	16	12		12		2
Brazil University	20	25		23		25
China Secondary		4	5	6	10	
China University		3	6	9	20	
India Secondary	20		14	6**	12	
India University	13		12	12**	12	
Russia Professional*			6	7	3	
Russia University		5	5	6	10	6

Source: Authors, 2013, Chapter 3. Note: *Post-secondary, non-tertiary. ** Males only.

Table 4. *BRIC Countries: Contribution of Components of Educational Change to Changes in Income Distribution, 1980-2008*

	Direction of Change in Variables, 1980-2008				
Country	*r*	*S*	*Var (S)*	*Var (r)*	*Cov (r, S)*
Brazil	Negative	Very positive	Very positive	Positive	Increasingly positive
China	Very positive	Very positive	Negligible	Positive	Negative to increasingly positive
India	Small negative	Very positive	Small positive	Small Negative	Negative to zero, hence positive
Russia	Negligible	Positive	Small positive	Small positive	Somewhat negative to positive

Source: Tables 2 and 3

Table 5. Brazil: Estimated Net Public Subsidies per Student in Higher Education, 2002 and 2007 (2008 Reais)

	2002 Private Higher Education			2002 Public Higher Education			Total
Income Category	*% in Income Group*	*No. of Students*	*Subsidy/ Student*	*% in Income Group*	*No. of Students*	*Subsidy/ Student (Reais)*	*Net Subsidy/ Student (Reais)*
Bottom 40%	0.034	82,552	0	0.073	76,796	14,374	6,927
Next 20%	0.057	138,396	0	0.11	115,720	14,374	6,546
Next 20%	0.19	461,320	0	0.25	263,000	14,374	5,219
Next 10%	0.235	570,580	0	0.215	226,180	14,374	4,080
Top 10%	0.485	1,177,580	0	0.352	370,304	14,374	3,439
		2,430,428			1,052,000		4,342 (avg.)
	2007 Private Higher Education			2007 Public Higher Education			Total
Income Category	*% in Income Group*	*No. of Students*	*Subsidy/ Student*	*% in Income Group*	*No. of Students*	*Subsidy/ Student (Reais)*	*Net Subsidy/ student (Reais)*
Bottom 40%	0.077	280,203	0	0.126	156,366	13,861	4,965
Next 20%	0.1	363,900	0	0.134	166,294	13,861	4,347
Next 20%	0.256	931,584	0	0.239	296,599	13,861	3,347
Next 10%	0.239	869,721	0	0.202	250,682	13,861	3,101
Top 10%	0.335	1,219,065	0	0.299	371,059	13,861	3,234
		3,664,473			1,241,000		3,507 (avg.)

Source: Authors' estimates based on Schwartzman, 2004 and Eckert Baeta Neves, 2009, plus enrollment data from Authors, 2013, Chapter 2 and public spending per student data from Authors, 2013, Chapter 4.

Table 6. Russia: Estimated Average Higher Education Public Subsidy per Student by Per Member Family Income of Students, 2010.

Reported Per Member Family Monthly Income (rubles)	*Average Fee Paid (rubles) by Those Students Paying Fees (rubles)*	*Share of Fee-Paying Students in Income Group (percent)*	*Average Fee Paid per Student in Income Group (rubles)*	*Estimated Total Spending per Student, Including Student Fees in Public Institutions) (rubles)*	*Estimated Average Subsidy per Student in Each Group (rubles)*
Less than 4,000 rubles	50,368	24	12088	125,000	112912
4,000-7,000	44,511	23	10238	125,000	114762
7,000-10,000	50,283	36	18102	125,000	106898
10,000-15,000	42,954	40	17182	125,000	107818
15,000-20,000	63,017	48	30248	125,000	94752
20,000-30,000	68,237	51	34801	125,000	90199
30,000-40,000	65,541	66	43257	130,000	86743
40,000-50,000	67,734	51	34544	135,000	100456
50,000-100,000	72,810	49	35677	140,000	104323
> 100,000 rubles	80,570	54	43508	145,000	101492

Source: State National Research University Higher School of Economics, *Monitoring of the Economics of Education, 2010*.

Table 7. Russia: Income Distribution, Distribution of Students by Income Group, and Distribution of Government Higher Education Subsidies by Income Group, 2010

Reported Per Member Family Monthly Income (rubles)	*Percent of Population in Income Group*	*Percent of Students in Income Group*	*Average Subsidy per Student in Income Group (thousand rubles)*	*Percent of Total Government HE Subsidy Going to Each Income Group*
<5000	23	14	113	15.3
5001-10000	45	26	111	27.8
10001-15000	19	17	108	17.7
15001-25000	9	18	92.5	16.1
25001-45000	3	15.5	91	13.6
45001-60000	1	3.3	103	3.3
>60000	0	6.2	104	6.2

Source: Data on income distribution from Russia Longitudinal Monitoring survey, RLMS-HSE, conducted by the National Research University Higher School of Economics. Data on student distribution by income group from *Monitoring of the Economics of Education, 2010*.