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**WHY LOW INEQUALITY SPURS GROWTH:  
SAVINGS AND INVESTMENT BY THE POOR**

by

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## INTRODUCTION

New empirical evidence on the relationship between inequality and growth contradicts an important dimension of the conventional wisdom regarding the nature of the process of transforming low income into high income economies. The conventional wisdom: high rates of economic growth are likely to be associated with high levels of inequality in the distribution of income. This prediction, made decades ago, was largely based on economic theory. Kuznets (1955) saw rising inequality as the by-product of growth and structural change. As workers shift from a low to a high productivity sector there is a tendency for inequality to increase at first. Kaldor (1978) and -- more specifically for developing countries -- Galenson and Leibenstein (1955) saw the causality running the other way, from high inequality to rapid growth. If the rich have a higher marginal propensity to save than the poor, greater concentration of income results in higher savings in the aggregate, hence in more rapid capital accumulation and growth.

There is evidence, however, that countries which, in 1960, had relatively low levels of inequality grew faster over the subsequent three decades than countries in which the distribution of income was more skewed.<sup>1</sup> Rather than being associated with more rapid growth, high levels of inequality appear to be a constraint on growth. Thus, higher levels of inequality help to explain Latin America's slower growth relative to East Asia.

Figure 1 relates percentage growth in GNP for the period 1965 to 1990, and income inequality, as measure by the ratio of the income share of the top and bottom quintiles. Latin American countries are concentrated in the south-east corner, indicating that they experienced slow growth and high inequality, while

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<sup>1</sup> For estimates of growth rate functions in which the impact of initial inequality is econometrically assessed for a large number of developing countries while controlling for other determinants of growth, see Birdsall, Ross, and Sabot (1995) and Clarke (1995).

East Asian countries, having achieved both low inequality and rapid growth, stand alone in the north-west corner. Birdsall, Ross and Sabot (1995) assess econometrically the relationship between inequality and growth, controlling for other determinants of growth. The addition of a measure of inequality, in 1970 or earlier, to the basic Barro function explaining variations in growth rates among 74 countries over the period 1960-89 does not much change the parameter estimates. The results are presented in Table 1. The education variables remain significantly positive. The inequality variable is negative and significant (at the 10% level).

How important is high inequality as a constraint on growth? For this sample of low and middle income countries in 1960, the average annual growth in per capita GDP between 1960 and 1985 was 1.8 percent. One standard deviation increases in primary and secondary education raise growth rates by 0.62 and 0.34 percentage points respectively. A one standard deviation decrease in the level of income inequality raises the predicted growth rate by 0.32 of a percentage point. Although the impact on growth of a change in inequality is smaller than similar changes in enrollment rates, the effect of reducing inequality is still substantial. *Ceteris paribus*, after 25 years, GDP per capita would be 8.2 percent higher in a country with low inequality than in a country with inequality one standard deviation higher.

Why are the predictions of the old theory contradicted by the new evidence? Some suggested explanations focus on the political implications of a highly skewed distribution of income. Higher inequality leads to the political alienation of the poor and thence to greater political and economic instability. Instability discourages investment, thereby lowering growth. Alternatively, in a democracy, high inequality leads to popular demands for taxes on the capital of the rich, thereby discouraging investment and lowering growth.<sup>2</sup>

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<sup>2</sup> See, for example, Alesina and Perotti (1994), Alesina and Rodrik (1994), and Persson and Tabellini (1994).

In this paper we suggest a different explanation for the negative relationship between inequality and growth, one that does not depend on the impact of inequality on the political process. Rather we focus on the micro-economic behavior of poor households. We describe a set of circumstances which can trigger a savings and investment boom among the poor. The poor are credit constrained, implying that they cannot borrow to finance even those investments that yield extraordinary returns. And their poverty precludes much reduction of consumption as a means of financing investments. However, if the returns to labor are sufficiently high they can intensify their work effort to generate additional income to provide the funds for high return investments.<sup>3</sup> Under these circumstances the marginal propensity to save from this additional income may be exceptionally high -- 100 percent or more.

An outward looking, labor demanding growth strategy, of the sort adopted by the rapidly developing countries of East Asia, can generate the preconditions for a savings and investment boom by the poor. It can yield both high return investment opportunities for the poor and high returns to labor. A boom in savings and investment among the poor can, in turn, simultaneously reduce poverty and income inequality and stimulate growth, thereby helping to explain the growth with equity achieved in East Asia; by contrast an inward looking, capital intensive growth strategy, typical of Latin America, may constrain the labor supply, savings and investment of the poor, thereby contributing to both high inequality and low growth.

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<sup>3</sup> Unlike the labor surplus models that follow Lewis (1954), we assume that marginal returns to labor are greater than zero.

We develop these ideas in the rest of this paper. The next section discusses in more detail our hypotheses regarding high return investment and employment opportunities as determinants of savings by poor, credit-constrained households.<sup>4</sup> In section III we assess whether the assumptions of the model are realistic. Section IV considers the implications of the model for the relationship between inequality and growth, with a focus on human capital investment in Brazil and Korea. Section V concludes.

## II: SAVINGS AND INVESTMENT BY THE POOR

In high income countries, economists normally distinguish between the determinants of savings and the determinants of investment. Because of financial intermediation, households can borrow to finance current investment that exceeds desired current saving, and can accumulate financial assets in years that desired saving exceeds desired investment. Therefore, in permanent income and life-cycle models of savings behavior, while savings in any one year are influenced by current income -- considered exogenous -- over the long run households save in productive years to provide income for unproductive years in the future. A typical household first accumulates and then decumulates assets.

Savings behavior in high-income countries, however, does not typically follow the predictions made by life-cycle and permanent income models (Deaton 1992a, Carroll 1994). Precautionary motives and liquidity constraints are gaining more prominence as explanations. In low income countries, where a high proportion of households are multi-generational (Deaton 1990), life cycle and permanent income models are likely to be even less relevant. Adults expect their children to support them in their old age, as they themselves are supporting their parents. Thus there may be little need for lump-sum or retirement savings as a vehicle for transferring income between high and low productivity phases of the life cycle.

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<sup>4</sup> The analysis in this section summarizes the implications of a formal model developed in Birdsall, Pinckney, and Sabot (1995).



In such households, savings serve in part as a buffer against stochastic decreases in income. Deaton (1990 p. 61) asserts that such households dissave as often as they save, do not accumulate assets over the long term, and have on average very small asset holdings. Deaton (1990, 1992b) develops a model of this precautionary savings behavior of low-income, multi-generational households.<sup>5</sup> His model assumes that households cannot borrow.<sup>6</sup>

Households may choose to hold precautionary savings in unproductive but liquid assets such as stocks of food, jewelry, and precious metals. When they choose to save in productive assets, however, the return to investment represents an incentive to save over and above the benefits in terms of risk reduction. In the absence of borrowing, household investment must be financed by -- and thus can be no greater than -- household savings. This implies that the expected returns to investment will be, in effect, the interest rate<sup>@</sup> relevant for determining savings (as noted by McKinnon 1973). It also implies that an increase in the returns to investment will directly increase incentives for saving.<sup>7</sup> Schultz (1964) recognized this in his explanation

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<sup>5</sup> Much recent research has investigated the saving and dissaving response of rural households to income shocks. See, for example, Townsend (1995) and Paxson (1992).

<sup>6</sup> At least for some households, borrowing restrictions are real and necessary to explain what we observe. (Deaton 1990)

<sup>7</sup> Where there is financial intermediation the improvement in incentives to save when expected returns to investment improve is indirect, through increased demand for loanable funds and consequent increases in interest rates.

of the correlation of low observed savings rates and the absence of profitable agricultural investment opportunities.

On the one hand, households can increase the share of present income allocated to savings only with substantial sacrifice. There are few luxuries to cut out of consumption bundles that are already scanty. And the poor are likely to have high rates of time preference given the pressing nature of many of their demands for cash. If the returns to investment are initially low, below the rate of time preference for the poor, then savings will result only from precautionary motives. In many environments the incentives for the poor to invest are in fact low.



On the other hand, consider the impact of an increase in the returns to investment -- such as might arise from the development of a new agricultural technology, more favorable agricultural price policies, the introduction of a new crop, an improvement in the quality of local schools, or a rise in the demand for educated labor -- on income and savings of the poor. An increase in the returns to investment that raises the rate of return above the rate of time preference, will, by definition, be attractive to the poor and will induce some poor households to search for ways of obtaining investible funds.<sup>8</sup>

In the presence of credit constraints, the attractive new investment must be financed without borrowing. There are only two possibilities for a household in this situation: finance the investment by decreasing consumption or finance the investment by increasing work effort and thus income. This latter mechanism is vitally important. Past analyses of savings behavior by the poor, and the response of the poor to improvements in investment opportunities, have considered income to be exogenous. But a rational household faced with improved investment opportunities that yield returns above the rate of time preference, will respond by working harder to finance the investment as long as the marginal returns to additional labor are above zero (Birdsall, Pinckney, and Sabot 1995). Present income, then, is a function of the rate of return to investment.

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<sup>8</sup> Bruton (1985) argues that search behavior plays a key role in development. He contends that the impact of a policy change that increases returns to investment by the poor could be greater than the change in marginal conditions suggests, by inducing search for yet more profitable investments.

In effect, the increase in the rate of return to investment increases the marginal utility of money in the initial period for a credit-constrained household. This induces the household to accept a lower level of leisure and a lower level of consumption initially, to allow the investment to take place.<sup>9</sup> The household is trading off a loss in utility in the initial period for a larger gain in utility in the future.

In this case, the marginal savings rate of a poor, credit-constrained household will be greater than one. When investment opportunities improve, all of the increase in income that results from increased labor supply is added to savings; in addition, savings increase by the amount that consumption decreases. This high marginal savings rate can lead to overall savings rates for the poor which are quite large, particularly when measured as a percentage of income prior to the increase in investment opportunities.

The dynamics of this response to improved returns to investment can lead to a virtuous circle as increases in investment and income reinforce each other. The rate of time preference of the poor is likely to decline as their income increases. Other investment opportunities then become attractive and labor supply, savings and investment will increase in order to match savings to desired investment.

The initial increments to savings and investment triggered by an increase in returns to investment will be positively related to the returns to labor. The marginal productivity of additional labor must be sufficiently large, and decline slowly enough, to allow for an increase in current income from decreased leisure.

Moreover, where returns to investment are already high, increases in the demand for labor, hence in

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<sup>9</sup> There is no income effect of the increase in investment returns on consumption in the first period; with a binding credit constraint, the positive impact on consumption of that increase in returns is realized only in the second period. In each period, the marginal utility of leisure must equal the marginal utility of consumption times the marginal productivity of labor. An increase in the returns to investment induces more work and *reduced* consumption in period one to finance the investment; labor supply increases and consumption decreases in such a way to maintain the equality.

returns to labor, can be another trigger for large increases in savings and investment. If at the margin returns to labor are low or decline rapidly, only slight increases in labor supply will occur. Therefore, nearly all of any increase in savings will result from decreases in current consumption. Given that small declines in consumption of the poor are likely to increase the marginal utility of consumption substantially, where the labor supply response is limited only small increases in savings are likely to result from improvements in investment opportunities. This implies that a boom in savings among the poor is unlikely to occur when there are conditions of surplus labor of the sort described by Lewis (1954).

In sum, there are two mechanisms which can lead to high marginal savings rates by poor credit-constrained households: First, when the perceived rate of return to investment increases to the point where it is above the discount rate, poor households will have an incentive to invest, and to decrease consumption and increase income to finance that investment. Second, if the return on investment is sufficiently high, an increase in returns to labor at the margin may lead to increases in labor supply, income, and savings. If both mechanisms are triggered the total impact on savings is more than additive. A labor- and skill-demanding, agricultural-based, and export-oriented development strategy, like the strategies adopted in East Asia, may raise returns on both investment and labor, thereby triggering both mechanisms (Birdsall, Ross and Sabot 1995).

### III: ASSESSING KEY ASSUMPTIONS

Without credit constraints there will be no boom in savings and investment. If households are able to borrow at an interest rate less than their discount rate, they will finance high return investments by borrowing rather than by decreasing either consumption or leisure. A household that can borrow will respond to an increase in the rate of return to investment, hence in permanent income, by borrowing more. The household

will also consume more and work less in the first period.<sup>10</sup> So our story requires that credit constraints are binding.

Poor households do borrow: Deaton (1992b) reports that 25 to 40 percent of rural households surveyed in the Ivory Coast and Ghana had outstanding loans. In Nigeria, Pakistan, Kenya, and Tanzania surveys indicate that 65 to 90 percent of households borrowed at some point during a twelve-month period (Udry 1993, Alderman & Garcia 1993, Kimuyu 1994). However, nearly all of these loans are for short terms, one cropping season or less. The present year's crop is often used as collateral. In East Africa less than one percent of surveyed households had loans that extended beyond the next harvest (Kimuyu 1994).<sup>11</sup> It appears as though borrowing to finance multi-year investments, such as the planting of tree crops or

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<sup>10</sup> See Shibli (1991) for a discussion of the borrowing response to improved investment opportunities by households.

<sup>11</sup> See Behrman, Foster, & Rosenzweig (1995) for convincing evidence that the poor in rural Pakistan are credit-constrained even in the short period between planting and harvesting. See also Bhalla (1978), Jacoby (1994), and Rosenzweig & Wolpin (1993) for indirect evidence of the importance of borrowing constraints in developing countries. On the macro level, liquidity constraints are being used increasingly to explain savings behavior even in rich countries (Deaton 1992a).

augmenting human capital, is simply not feasible for poor households without collateral.<sup>12</sup>

In our story, households can only produce income via self employment or by investing. Taking account of a market in which labor can be purchased or sold if anything strengthens our results. Household labor supply would still depend on the marginal utility of leisure, as well as on the returns to investment, the discount rate and the marginal product of labor. Allowing households to sell labor in a perfect market, with the possibility of negative sales<sup>13</sup> if the demand for leisure is high enough, would lead to one important change: the output of the own-produced good would no longer increase in the first period in response to an increase in the returns to investment. However, the basic thrust of our story -- that households increase work effort, hence income and savings, in response to an improvement in investment opportunities -- still holds. Consumption would still decrease in the first period, but rather than increasing labor in self-employment, households instead would raise income by increasing labor market activity. At the margin, as investment opportunities improve, households will either decrease the amount of labor hired or increase the amount of labor sold so as to obtain the income necessary to finance investments. If the labor market is large, then marginal returns to labor are constant, *increasing* the impact on savings of an improvement in investment opportunities.

#### IV: AN APPLICATION

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<sup>12</sup> Income and credit constrain investment in human capital only when expected returns to schooling are high. If these returns are low, an increase in the income of the poor may have little or no impact on investment in schooling. Thus, empirically estimated income elasticities of demand for schooling, as conventionally measured, are of little relevance to assessing the model's assumptions. To test our model the demand equations need to include controls for expected returns to investment.

We have suggested that a boom in savings and investment -- for example in agriculture and in human capital -- by the poor may help explain the association of rapid growth and low inequality in East Asia. Data on savings and investment disaggregated by income are not easily available. However, aggregate data on agricultural growth and productivity, and on educational change, comparing East Asia and Latin America, are consistent with our story. It appears that in East Asia the poor participated through their own investments in the agricultural growth and educational change that fueled East Asia's economic success -- but did not participate in Latin America.

It is commonplace that the agricultural sector included a large portion of poor households in developing countries, especially in the early postwar decades. Thus policies that penalized agriculture almost certainly penalized the poor. Schiff and Valdes (1992) report that countries in East Asia such as Korea and Malaysia taxed agriculture (directly and through exchange rate and other policies) much less than countries in Latin America. It is also the case that agricultural production and income grew much more rapidly in East Asia, at more than three times the rate of growth of the agricultural labor force, compared to only 50 percent greater in Latin America (Turnham, 1993). Obviously, measured increases in total factor productivity in agriculture in East Asia were substantial -- an annual rate of 2.2 percent from 1965-1988. These measured increases may in fact reflect in part increased but unmeasured investments in agriculture by the poor smallholder households (Timmer, 1995), and unmeasured increases in labor hours and work effort by households who saw returns to their investments rising as urban workers' consumption demands increased (Ranis and Fei document this process for Taiwan, 1981).

In short, in East Asia unlike in Latin America, the poor in the agricultural sector, had increasing opportunities for high return investments. These opportunities occurred in a context of rapidly growing labor demand as wages and the labor force in the manufacturing sector expanded rapidly (manufacturing sector employment in Korea increased by 58% from 1975 to 1985). Their savings and investment have not been

systematically measured, but surely contributed to the rapid growth of agricultural production.

A similar story can be told about high rates of investment in education, including by the poor, in East Asia. Birdsall, Ross and Sabot (1995) provide evidence of rates of enrollment in education in East Asia above those predicted for countries at their level of income; high enrollments represented investments by families in the human capital of their children. They also provide evidence that rapid accumulation of human capital both stimulated growth and reduced inequality. In the remainder of this section we show how marked differences between Korea and Brazil in investment in human capital contributed to differences between the countries in growth rates and levels of inequality, and suggest that policies conducive to a boom in savings and investment among the poor contributed to Korea's superior growth rate and its success in reducing inequality.

Regressing secondary school enrollment rates on per capita national income for more than 90 developing countries for the years 1965 and 1987 indicates that Korea was well above the regression line -- secondary enrollment rates were higher than predicted for countries at its level of income -- while Brazil was well below the line.<sup>13</sup> Where enrollment rates are low children of the poor are the least likely to be enrolled. A corollary of the difference in enrollment rates between Brazil and Korea is a higher rate of investment in human capital by the poor in Korea.

The cross-country growth regression estimated by Birdsall, Ross, and Sabot (1995) can be used to estimate the impact of this difference in enrollment rates on growth. If Korea had had Brazil's 1960 enrollment rates, its growth rate would have been 5.6 percent rather than 6.1 percent, resulting in 1985 per capita GDP 11.1 percent less than Korea actually attained. This estimate only establishes a lower bound for

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<sup>13</sup> While inequality of access by socioeconomic background is higher, inequality of access by gender is nearly as low in Latin America as in East Asia.

the costs to Brazil of low investment in human capital; for one thing, it assumes quality of schooling did not decline, with concomitant declines in the economic returns to schooling, which it almost certainly did.<sup>14</sup>

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<sup>14</sup> Public expenditures per eligible school-age child rose more than 350% in Korea between 1970 and 1989, while they rose just 191% in Brazil. The increase in Brazil, combined with declines in administrative efficiency, was insufficient to ensure maintenance of quality as the rapid enrollment increases brought a much poorer pool of students into the system. Completion rates, an indicator of quality, fell in Brazil; in the same period they rose in Korea (Birdsall and Sabot, 1996).



Low investment in schooling, especially for the poor, also appears to have prevented any improvement in the highly unequal distribution of income in Brazil. In Korea, with rapid educational expansion in the 1960s and 1970s, the relative abundance of educated workers increased and the scarcity rents which the educated earn were eroded, leading to reductions in the inequality of pay in the 1970s and 1980s. By contrast in Brazil the absolute increment to the labor force of relatively well educated workers was so small in the 1970s that it did not take much of an increase in the demand for educated workers to offset any wage compression effect of the increase in supply. The educational structure of wages barely changed. The net effect of educational expansion in Brazil over the decade was to increase the log variance of wages by roughly 4 percent, in marked contrast to a 22 percent decline that resulted from educational expansion in Korea.<sup>15</sup>

Marked differences in educational performance help explain why Korea has had both faster growth and lower inequality than Brazil. But why have enrollment rates, particularly among the poor, been so high (and drop out and repetition rates so low) in Korea? Why have enrollment rates, particularly among the poor, been so low (and drop out and repetition rates so high) in Brazil? The story we have told suggests some hypotheses.

Growth in Korea from 1970 to 1990 was export-oriented and labor-demanding. Over two decades, wage increases in the manufacturing sector were an estimated 8.7 percent while annual increases in wage employment were an extraordinary 18.7 percent.<sup>16</sup>

This employment and wage growth dramatically raised the returns at the margin for the labor of the poor, making it attractive to increase time allocated to work in order to finance high return investments, including investments in the education of children. The labor demanding growth path became increasingly

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<sup>15</sup> Birdsall and Sabot, 1996; Knight and Sabot, 1990.

<sup>16</sup> Banerji, A., E. Campos and R. Sabot, 1994, citing World Bank (1993b) and ILO Yearbook of Labor Statistics (various issues).

skill-intensive over time, contributing to high expected rates of return to schooling, hence to strong household demand for education. Public policy also ensured high quality schooling even in poor districts, thereby contributing to the high rates of return to investment in schooling. In sum, in Korea there were strong incentives for the poor to invest in their children and to work more to finance that investment. It is our supposition that marginal savings rates among the poor were exceptionally high, as households saved in the form of investing in their children's education. This new savings among relatively poor households, as primary and secondary enrollments rose dramatically over two decades, helped ensure education's contribution to aggregate growth set out above.

By contrast, in Brazil the inward looking growth strategy was not labor demanding and so, for the poor, the returns to additional labor time allocated to work were quite low. Lack of dynamism in the demand for labor and skill held down expected returns to investment in schooling. In addition, school quality for the poor tended to be abysmal. Because of the limited supply of educated workers average returns to investment in schooling were high, but for the poor returns to investment in schooling were low (Birdsall & Sabot, 1996). In sum, in Brazil public policy created incentives for high levels of leisure and low levels of savings among the poor.

More generally, our story predicts higher investment in schooling in countries with lower inequality. Where inequality is low, the poor are likely to be benefiting from high returns to labor and to investment in human capital, and thus to save and invest more, including in education. Table 1 presents data from four sets of countries. Within each set per capita incomes are roughly the same. However, the share of GDP going to the poorest quintile, hence the mean absolute income of the poorest quintile, varies considerably. In all but one case, the country with lower inequality has higher secondary enrollment.

## V: CONCLUSIONS

We have told a story about savings for households that cannot borrow, in which an increase in returns to investment can raise savings, income, and labor supply. We have suggested that improvements in investment opportunities and returns to labor -- features of a labor demanding growth strategy -- can lead to exceptionally high marginal savings rates by the poor. Reductions in poverty and income inequality may result. Low inequality and its corollaries -- higher absolute incomes of the poor and higher returns to the poor's labor and investment -- can also result in higher aggregate savings and investment rates. The implications of our story are therefore potentially far-reaching: ensuring that the poor face incentives to invest and to work more can result not only in higher incomes for the poor, but also faster growth and lower overall levels of inequality. Our story suggests a micro-economic explanation for the cross-country relationship between low inequality and rapid growth that does not rely on the political benefits of low inequality.

Our analysis is of particular relevance to Latin America. The distribution of income is more unequal in Latin America than in other developing regions, in part because policies have been more biased against the poor. Low inequality combined with high growth in East Asia over now three decades suggests that sustained growth requires that the poor contribute to as well as benefit from the development process. Ensuring that the poor have opportunities to contribute to growth in Latin America is thus not a matter of altruism but of enlightened self-interest. The challenge in Latin America is to find ways to reduce inequality and make growth more inclusive, not by growth-inhibiting transfers and regulations, but by improving investment opportunities for the poor and shifting to a more labor demanding growth path. It is important that the poor be beneficiaries of the growth process. Our analysis of savings and investment suggests they can be an engine of growth as well.

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