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on Economic Development  
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# The Effect of Foreign Investment on Economic Development and Income Inequality

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# The Effect of Foreign Investment on Economic Development and Income Inequality

## Abstract

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In this paper, we assess the effect of globalization on the distribution of income within countries, focussing on the influence of foreign direct investment. We analyze data for 72 countries, 1970-90. We incorporate in our tests the Kuznets (1955) curve, measures of the character of political institutions, and various aspects of the economy and society that have been emphasized in recent research. Our results are easy to summarize. Globalization has little effect on income inequality within countries. The ratio of foreign direct investment stock to gross domestic product is unrelated to the distribution of income. Income inequality in developing and developed countries is unaffected by the presence of multinational corporations. Nor are alternative measures of economic openness—the trade-to-GDP ratio and Sachs and Warner's (1995) measure of free trade policy—associated with greater inequality. The share of income received by the poorest 20% of society in particular is not influenced by the economic importance of foreign investment. If foreign investment increases average incomes in developing countries, as we confirm here, and does not affect the distribution of income, it must benefit all segments of society in developing countries.

# 1 Introduction

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Sociologists have long been interested in the consequences of globalization for economic development. The effect of foreign investment on both growth and income inequality in developing countries has been of particular concern. In 1978, Bornschieer, Chase-Dunn, and Rubinson concluded that foreign direct investment increased growth in the short term but, over time, penetration by multinational corporations slowed the economies of the periphery. They noted that their analyses of the stock and flow of foreign investment were consistent with the majority of previous studies. They are also consistent with a number of studies published subsequently (viz., Gobalet and Diamond 1979; Bornschieer and Chase-Dunn 1985; London 1988; Boswell and Dixon 1990; Wimberly 1990; Wimberly and Bello 1992). The effect of the multinationals' presence on inequality has seemed even clearer. In 1985, Bornschieer and Chase-Dunn noted that of 15 studies only one (Weede and Tiefenbach 1981) did not find that foreign investment increased income inequality. Later, Chan (1989) concluded that foreign penetration was the factor most strongly associated with greater disparity in incomes within developing countries. Because of foreign investment's adverse effects on growth and inequality, dependency theory seemed to be correct: multinational corporations distorted economies in the periphery, leading to the "development of underdevelopment" (Frank 1969).

In the 1990s, the debate over dependency theory focused on the consequences of foreign investment for economic growth, rather than income inequality. There were several reasons for this. First, sociologists and economists alike recognized that the experiences of developing countries differed markedly. There was neither unconditional convergence of the poor on the rich nor uniform stagnation in the periphery (Korzeniewicz and Moran 1997). Dependency theorists sought to account for the success of the Asian Tigers by differentiating countries in the semi-periphery from peripheral states for which economic growth remained elusive. The second reason that research in the 1990s focused on economic growth was Firebaugh's (1992, 1996) challenge to previous work by dependency theorists. Bornschieer and Chase-Dunn (1978, 1985), he argued, had misinterpreted their results: the apparently adverse effect of foreign stocks on growth was a statistical artifact of their method of testing. De Soysa and Oneal (1999) confirmed Firebaugh's conclusion, showed that foreign investment flows were more productive than capital from domestic sources, and they demonstrated that foreign capital stimulated investment by local entrepreneurs. Finally, research on income inequality was side-tracked by questions about the data. Social scientists became increasingly concerned about the uneven quality, uncertain comparability, and limited availability of the surveys reporting the distribution of income within countries.

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Deininger and Squire's (1996) collection and evaluation of the available data on income inequality provides an opportunity to reassess the effect of globalization on disparities within countries, especially in the developing world. While recent research indicates that foreign investment promotes economic growth in the periphery, the standard of living of the average person in developing countries will improve only if foreign investment does not at the same time adversely affect the internal distribution of income. In fact, dependency theorists warn that investment by the multinational corporations leads to marginalization of the poor in peripheral countries. We assess this claim. Consistent with past research, we focus on the influence of foreign direct investment (the "penetration" of a host economy by multinational corporations) on income inequality. The presence of multinational corporations is measured using data recently published by UNCTAD (2000) and the World Bank (1999). We also assess the effects of trade and of policies associated with free trade (Sachs and Warner 1995) on the distribution of income within countries. We take care to measure the effect of globalization on incomes in the periphery and within the poorest segment of society.

In the next section, we reproduce key analyses reported in de Soysa and Oneal (1999) to show that their results hold with the newer data on foreign investment stocks released by UNCTAD (2000). As before, foreign direct investment is found to be more productive dollar for dollar than capital from domestic sources, and there is no evidence that a large foreign presence adversely affects growth. In section three, we briefly review theoretical accounts of the effects of multinational corporations on income inequality in developing countries. We discuss recent contributions of economists regarding other causes and correlates of income inequality in section four. We present our analyses of income inequality in 72 countries, 1970-90, in section five.

Our results are easily summarized. We find no evidence that foreign direct investment increases income inequality in developed or developing countries. Nor do other characteristics of globalization—a high volume of exports and imports or policies conducive to free trade—adversely affect the distribution of income. Tests focusing on the income share of the poorest 20% of society produce similar results. We find support for Kuznets' (1955) inverted U-shaped curve relating inequality to average incomes in the cross-national data, but not in the time series of individual countries. Countries with a dual economy (modern industry and backward agriculture) are more unequal (Bourguignon and Morrisson 1998), while socialist states have relatively equal income distributions. We conclude that our current understanding of the determinants of income inequality is really quite limited; but there is no evidence that economic dependency plays a role.

## 2 Reassessing the Effect of Foreign Investment on Economic Growth

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De Soysa and Oneal (1999) estimated the effects of foreign direct investment (FDI) on economic growth, 1980-91. The debate between dependency theorists and the modernization school had intensified as a result of Firebaugh's (1992) critique of the so-called PEN research on FDI and growth.<sup>1</sup> Firebaugh demonstrated that the negative effect of FDI stock, which had been reported as the adverse consequences of dependency for more than a decade, is really a statistical artifact of including flows and stocks in the same regression model. Bornschier and Chase-Dunn (1985), for example, reported a positive effect on growth for the flow of foreign investment but a negative effect for stock; but the apparently adverse effect of foreign stock is a "denominator effect". By definition, the rate of increase in foreign investment equals flow divided by stock; therefore, the greater the initial level of stock, holding flow constant, the lower the growth rate of foreign capital. It is hardly surprising, and no sign of exploitation, that a slow increase in the rate of investment is associated with a low rate of growth in per capita income.

Firebaugh suggested, however, that foreign investment is less productive than capital from domestic sources, basing his conclusion on the magnitude of the estimated coefficients for the growth rates of foreign and domestic investment in the revised regression equation. Subsequently, Dixon and Boswell (1996) acknowledged the denominator effect; but they drew attention to Firebaugh's finding of a differential in productivity favoring domestic capital. They also stressed that in his revised analyses Firebaugh had not tested the central thesis of dependency theory: that a large accumulation of foreign investment gives multinational corporations the power to shape the political economy of developing economies to their own advantage, at the expense of the host country. Dixon and Boswell added measures of the stock of foreign and domestic investment relative to gross domestic product (GDP) to the corrected growth equations and reported renewed support for dependency theory. The PEN measure was still negative after properly measuring the growth rate of FDI. They concluded that as less productive foreign investment replaces capital from domestic sources economic growth slows.

De Soysa and Oneal (1999) improved on previous studies by moving away from the PEN data on foreign investment stocks. These had been collected more than two decades earlier and

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<sup>1</sup> PEN research is a standard term for a large body of empirical research on the effects of foreign direct investment. The term is a short-hand reference to the penetration of developing countries by multinational corporations. This was generally measured in terms of the stock of foreign investment relative to the total stock of a nation's capital or to its GDP. PEN research provided support for dependency and world-system theories that viewed multinational corporations as exploitative instruments of a capitalist world system.



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covered a relatively short period of time.<sup>2</sup> Instead, they analyzed economic growth, 1980-91, using data on the stocks of foreign investment collected by UNCTAD (1995) for 114 countries including 97 less developed countries (LDCs) versus 76 in the PEN research. Their results were consistent with previous studies in many respects, but the ratio of foreign stock to GDP was far from statistical significance. De Soysa and Oneal also noted that both Firebaugh (1992, 1996) and Dixon and Boswell (1996) had misinterpreted their results regarding the difference in productivity between foreign and domestic capital. Foreign investment would adversely affect growth if it were less productive *and* displaced domestic capital. De Soysa and Oneal showed, however, that FDI was more productive dollar for dollar than domestic investment, 1980-91, and the flow of foreign investment encouraged investment by local capitalists.

Firebaugh had mistakenly concluded that new foreign investment is less beneficial than domestic capital by comparing the sizes of the estimated coefficients of their growth rates, but a 1% increase in foreign investment is much smaller in dollars than a 1% increase in domestic investment. Indeed a 1% increase in domestic capital added 13 times as much to the total stock of capital as a 1% increase in FDI (de Soysa and Oneal 1999). Consequently, dollar for dollar, foreign investment produced 2.6 times as much growth as capital from domestic sources—a finding consistent with the view that foreign direct investment brings with it advanced technologies, superior management, and established links to the global economy (Borensztein, Gregorio, and Lee 1998; Cooper 2001). In addition, De Soysa and Oneal (1999) used Granger-causality tests to show that foreign investment encouraged rather than displaced domestic investment. They concluded that developing countries need not fear that multinational corporations systematically retard economic growth. Rather, foreign investment appears to provide substantial benefits to developing countries. It is more productive than domestic capital and encourages investment from domestic sources. Nor is there evidence that multinationals gain economic power that adversely affects host countries: growth in peripheral countries is unaffected by the mix of foreign and domestic investment in the total stock of capital.

Since publication of de Soysa and Oneal (1999), UNCTAD has issued new figures on foreign direct investment following a revision in the procedures for collecting its information. Now estimates derived from the balance of payments are verified in almost all cases with national sources. In several instances, especially for African countries, the revisions are substantial. The correlation between the ratio of FDI to GDP in 1980 based on UNCTAD (1995), de Soysa and Oneal's primary source, and estimates from the new UNCTAD (2000) is .70. In addition, de Soysa and Oneal calculated the growth rate of foreign investment from 1980 to 1990 using UNCTAD's (1995) estimates of the stock of FDI in 1990. Unfortunately, in some cases UNCTAD calculated the stock in 1990 by summing the flows of foreign investment in current

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<sup>2</sup> The PEN data are also less reliable than current compilations by UNCTAD and the World Bank. The compilers of the PEN data warned that their data should be "used with caution since the values are only estimates" (Ballmer-Cao and Scheideger 1979, p. 122). Comparability of national data remains an issue, but UNCTAD concludes that its data allow greater confidence in investigations of the effect of FDI than has previously been possible (United Nations 1992, p. v).

dollars and adding this to the stock in 1980. The sum of the flows in constant dollars should have been used.

For these reasons, before assessing the effect of foreign investment on income inequality, we first re-estimate the key results regarding economic growth reported in Table 3 of de Soysa and Oneal (1999).<sup>3</sup> We use UNCTAD's (2000) revised data for the stock of FDI in 1980. We calculate the average growth rate of foreign investment, 1980-90, based on stocks in 1980 and 1990. To calculate 1990 FDI stocks, we converted foreign investment flows to constant dollars, accounted for depreciation using the accelerated method with a half-life of 10 years, summed the resulting figures between 1980 and 1990, and added this amount to UNCTAD's estimates for 1980. Our data for flows are from UNCTAD (2000) and the World Bank (2000).

We restrict our analyses to the less developed countries, 1980-91, as in the original study. We estimate the effect of the stock and growth rate of FDI on growth in GDP per capita while controlling for the stock of capital from domestic sources in 1980, its growth rate between 1980 and 1990, the average income of a country at the start of the period, the trade-to-GDP ratio, a nation's economic size, and the availability of human capital. Human capital is estimated using data on secondary school enrollment rates, the mortality rate of children under five, and the fertility rate. These control variables are the same as those used in de Soysa and Oneal (1999), where they are discussed in detail. We use ordinary least squares regression with Huber/White robust standard errors to take into account heteroskedasticity. With the revised UNCTAD (2000) data, we have observations for 84 developing countries.

Our new analyses are presented in Table 1. In column 1 is the simpler model. The results are very similar to those reported by de Soysa and Oneal (1999). Increases in both foreign and domestic investment spur growth in average incomes in developing countries. The ratio of foreign direct investment to GDP is not significantly related to growth. Thus, there is no indication that a large presence of multinational corporations adversely affects economic growth in the periphery. Domestic capital stocks measured in 1980 are also unrelated to growth in the subsequent ten years. This is not surprising. The stock of investment is associated with the level of production (and income), while growth in the capital used in the process of production generates growth from this baseline. The trade-to-GDP ratio is positive but not statistically significant. Growth is negatively associated with per capita GDP at the start of the period ( $p < .02$ ) when the influence of human capital ( $p < .04$ ) is held constant. This is consistent with the hypothesis that convergence in the incomes of the poor on those of the rich is conditional on the social capability of a society to absorb advanced technologies. Growth is positively related to economic size ( $p < .02$ ) as measured by GDP.

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<sup>3</sup> De Soysa and Oneal's (1999) Granger-causality tests of the relationship between FDI and investment from domestic sources are based on the annual flows of capital as a fraction of GDP in each year; therefore, they are unaffected by the changes in UNCTAD estimates of the stock of foreign investment in 1980 and 1990.

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As in de Soysa and O Neal, an increase in foreign investment has a greater effect dollar for dollar on production and consumption than does capital from domestic sources. A 1% increase in domestic investment boosts economic growth by 0.258%, while a 1% increase in FDI raises growth by 0.094%. Because the median ratio of domestic to foreign investment stock in our sample of LDCs is 15.7:1, it would require a 15.7% increase in foreign investment to equal the same increase in dollars as an increase of 1% in domestic capital. New foreign investment of this magnitude would raise per capita income by 1.48% ( $.094 * 15.7$ ). Thus, foreign capital is 5.7 times as productive as domestic capital dollar for dollar.

In column 2, we include interactive terms of both foreign and domestic investment with human capital. Human capital conditions the productivity of financial capital and may be particularly important for foreign investment because of the more advanced technologies that it embodies (Borensztein, Gregorio, and Lee 1998). The estimated coefficients for both interactive terms are positive as expected, and the interaction with domestic capital is just misses statistically significance. Nevertheless, the probability that the estimated coefficients for the foreign investment rate and its interactive term are jointly equal to zero is .003 ( $F = 6.2$ ). As in column 1, there is no evidence that "foreign penetration" adversely affects economic growth in developing countries.

To summarize, we have replicated the key analyses reported in de Soysa and O Neal (1999) because UNCTAD made substantial revisions between 1995 and 2000 in its data on the stocks of foreign direct investment. Our tests confirm the results reported earlier. An increase in foreign investment raises average incomes in developing countries. Indeed, FDI is more productive than capital from domestic sources, presumably because it brings advanced technologies, better business practices, economies of scale, and integration into the international economy. There is no evidence that economic growth in developing countries is adversely affected when the stock of foreign investment relative to GDP increases.

### 3 Previous Research on Foreign Investment and Income Inequality

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The critique of capitalism offered by the Left has changed over time. Marx (1972 [1853]: 583-8) believed that the capitalist system would spread throughout the world, destroying pre-capitalist modes of production and starting peripheral regions on the path to development pioneered by Britain. For Lenin, imperialism was the inevitable result of the monopoly stage of capitalism. The rate of return on investment was declining in the metropolitan countries, while developing regions offered new fields for investment where super-profits could be earned. As a consequence, the European powers acquired colonies to which they exported capital. Lenin (1964 [1917]) expected the periphery to grow as a result and the core to continue to stagnate.

A very different view was taken by early dependency theorists. The spread of capitalism was no longer expected to produce economic growth in the periphery. The persistence of poverty in much of the world led Baran (1956) to argue that the penetration of the periphery by international capital created obstacles to development--a process that Frank (1969) called the "development of underdevelopment". In a useful early review of the dependency literature, Chase-Dunn (1975) identified three mechanisms by which this process was thought to work: exploitation through "decapitalization" (the repatriation of profits to the core countries) and unequal exchange, structural distortion of the peripheral economies by specialization in the production of raw materials for external consumption, and the suppression of autonomous policies beneficial to the local populace by local governments who catered to the interest of the multinationals.

Over time, dependency theorists increasingly recognized that some less developed countries were experiencing rapid economic growth. They acknowledged that, as Marx and Lenin had anticipated, this could be explained in part by foreign investment; but the growth that resulted was said to be "distorted" and inegalitarian. Portes (1976), for example, argued that industrialization in the periphery occurred along with economic denationalization as the influence of the multinational corporations grew; therefore, "sustained economic growth has been accompanied by rising social inequalities" and "urbanization and the spread of literacy have converged with the ever more evident marginalization of the masses" (p. 75). Cardoso and Faletto (1979), in a book first published in 1969, called this process "associated-dependent development":

*By development, in this context, we mean "capitalist development." This form of development, in the periphery as well as in the center, produces as it evolves, in a cynical way, wealth and poverty, accumulation and shortage of capital, employment for some and unemployment for others. So we do not mean by the notion*

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*of “development” the achievement of a more egalitarian or just society. These are not consequences expected of capitalist development, especially in peripheral economies (p. xxiii).*

The concept of dependent development was further developed by Evans (1979) in his study of Brazil.<sup>4</sup>

By the end of the 1980s, most dependency theorists, despite diverse theoretical and methodological orientations, agreed that the main cause of income inequality within countries, especially in developing regions, was the international division of labor imposed by the capitalist world system. There was substantial empirical support for this view. In a survey of several theoretical perspectives, Chan (1989) found that the stock of foreign investment relative to GDP was the best predictor of income inequality in developing countries. These results reinforced the findings reported earlier by Bornschieer, Chase-Dunn, and Rubinson (1978) and Bornschieer and Chase-Dunn (1985). Kohli et al. (1984), too, found support for dependency theory, but only in cross-sectional analyses. As Evans and Timberlake (1980) had concluded, the relationship between dependence and inequality seemed “one of the most robust quantitative, aggregate findings available” (p. 532).

Kohli et al. (1984) identified several ways in which penetration by multinational corporations was thought to increase income inequality. First, foreign direct investment is capital intensive. Consequently, employees of the multinational corporations are relatively skilled compared to other workers in the host country, and they are well paid. This might produce an enclave economy, where pockets of modernization and prosperity are surrounded by poverty. In addition, many of the goods produced for consumption in host countries by the multinationals are not intended for mass consumption, so foreign capitalists might have a financial interest in seeing that local elites could afford to buy them (Bornschieer and Chase-Dunn 1985). Finally, and most important, dependency theorists emphasized the political influence of the multinational corporations over local governments. The multinationals, it was said, used their economic power to promote policies biased in favor of capital and against labor. In particular they demanded the suppression of labor movements that promoted workers’ rights or challenged capitalism itself. Bornschieer, Chase-Dunn, and Rubinson (1978) concluded that “[t]he effect of dependence on income inequality is most likely due to its effects on the class structure of the country and the translation of this class structure into political power” (p. 665).

That deep divisions separate the social sciences is no where more evident than in research on the effects of foreign investment on developing countries. Though the topic has been of great interest to sociologists and political scientists, it has been generally ignored by economists. Solow (1956) argued that capital would flow from developed to developing countries because of its relative scarcity and greater marginal returns in the periphery. This was expected to lead to rapid economic growth (Bauer and Yamey 1957; Rostow 1960). Economic development in the

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<sup>4</sup> This paragraph is drawn from Jackman (1982, pp. 180-2) and Packenham (1992).

1960s and 1970s was slower than economists anticipated, however; and it became evident that unconditional convergence in average incomes across countries was not occurring. Unlike dependency theorists, economists did not relate this to foreign influence. The only explicit test by economists of the effect of foreign direct investment on growth in developing countries is a recent one by Borensztein, Gregorio, and Lee (1998), who report that FDI flows promote growth. They do not consider whether a large foreign presence is detrimental.

Cooper (2001) recently reviewed the economic literature on the effects of globalization on growth and income inequality. As he notes, classical economic theory suggests that an inflow of capital reduces the prevailing return on investment within a host country and raises the marginal product of labor and hence the real wage. Since the ownership of capital is more concentrated than the income from labor, foreign investment should serve to equalize the distribution of income and raise its average. Cooper observes, however, that the number of workers employed by foreign firms is usually a small percentage of the labor force, so the impact of FDI on the distribution of income is apt to be limited. To the extent that it does have an effect, it should raise the incomes of the relatively skilled workers employed by the multinational corporations in comparison to those of both the richest and the poorest segments of society, as Bornschieer and Chase-Dunn (1985) also argue. Furthermore, the beneficial effects of foreign investment depend on the absence of trade restrictions. Nor is this possibility of merely theoretical interest; countries frequently adopt protectionist policies, sometimes explicitly to attract investment by multinational corporations. Cooper (2001, p. 32) concludes: "Foreign direct investment historically has been drawn by natural resources, by trade barriers, and by low domestic competition—which gives little confidence that direct investment has either enhanced growth or reduced inequality in income distribution."

## **4 Other Theories Regarding the Sources of Income Inequality**

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Although economists have generally ignored the influence of foreign investment on income inequality, they have long been interested in other factors that might affect it. Most notably, Kuznets (1955) in his presidential address to the American Economic Association suggested that there is an inverted U-shaped curve relating income inequality to average income. To support his views, he cited the experience of Britain, the United States, and Germany during the Industrial Revolution, when labor shifted over many years from agriculture to industry. Initially most people farmed, an occupation then characterized by stagnation, low productivity, and a low average income. The industrial sector was small in the 1700s but began to experience rapid growth due to the engineering application of science. This increased the productivity of labor in the factories and raised wages. As people moved out of the countryside, income initially became more unequal as migrants earned greater incomes in industry than they had received in farming. Over the long term, most workers made the transition. In the process, wages in agriculture increased as the supply of laborers in that sector declined. As a consequence of these several factors, incomes again became relatively equal but at a higher average level than when agriculture was dominant. Thus, in Kuznets' view, the distribution of income was determined primarily by the demographic response to increased demand for workers in industry, a more productive and higher paid economic sector. He also noted, however, workers organized for collective bargaining and political action as industrialization progressed, reinforcing the demographic process favoring the equalization of incomes.

Empirical assessments of Kuznets' (1955) theory have been inconclusive. Support has come from a number of studies (e.g., Adelman and Morris 1973; Ahluwalia 1976; Weede and Tiefenbach 1981; Muller 1988, Higgins and Williamson 1999; Barro 2000), but others have been equivocal, especially in the analysis of time-series rather than cross-national data (Kohli et al. 1984; Chan 1989; Anand and Kanbur 1993; Ravallion and Chen 1997; Deininger and Squire 1998). Interestingly, Kuznets' curve is not inconsistent with the theory of dependent development (Kohli et al. 1984). Foreign investment, by promoting growth, would increase income inequality in the early stage of industrialization (Cardoso and Faletto 1979; Evans 1979), if Kuznets is right.<sup>5</sup>

Of course, Kuznets (1955) did not claim that the relation between industrialization and the distribution of income is absolute. It depends on other social, political, and economic factors (Higgins and Williamson 1999). Kohli et al. (1984) has noted in particular the role that politics

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<sup>5</sup> Bornschier and Chase-Dunn (1985, pp. 126-9) offer a different explanation, drawn from world-systems theory, of the Kuznets curve.

might play, observing that socialist and communist governments make equality a primary objective of state policy. Democracies, too, are often thought to have more equal incomes because disadvantaged classes have a greater opportunity, especially through the electoral process, to press for redistribution. As long as the income of the median voter is less than the national average, democratic leaders may be responsive to this political demand in the hope of staying in power.<sup>6</sup> Democracies, however, do not unconditionally favor equality. They prize liberty as well. As long as individuals differ in talents and motivation, unrestrained liberty will lead to inequality. The balance between the competing ideals of equality and liberty is struck in the political process. The result may be laws guaranteeing only equality before the law, efforts to provide equal opportunity, or enforced equality of outcomes. The extent to which a democracy seeks to reduce inequality depends, then, on what objective is adopted. In any case, it is reasonable to expect that democratic processes will operate gradually; and Muller (1988) has reported that older democracies, but not newer ones, are more egalitarian than are non-democratic societies. This may account in part for the lack of support for the simple hypothesis that democracies as a rule are characterized by relatively equal distributions of income (Kohli et al. 1984; Bollen and Jackman 1985; Barro 2000; Dollar and Kraay 2000), though Chan (1989) found no support for Muller's finding as well.

The interests of economists and sociologists have converged to a degree with regard to the possible effect of trade on income inequality. The Stolper-Samuelson theorem, derived from the work of Heckscher and Ohlin, holds that opening an economy to trade will increase the income of the factor of production used intensively in the export industry. Because developing countries have a comparative advantage in unskilled labor, trade should decrease income inequality in the periphery; for the same reason, economic openness should increase inequality in core countries where the smaller number of skilled workers will benefit relative to their unskilled compatriots. The evidence, however, is hardly consistent with this prediction. Borsu and Glejser (1992) report that free trade favors a more equitable income distribution generally; but Higgins and Williamson (1999) find that Sachs and Warner's (1995) indicator of economic openness has little effect on the distribution of incomes in either developed or developing countries. Nor did any of several alternative measures, i.e., the trade-to-GDP ratio, the presence of capital controls, or the level of quotas and tariffs, influence income inequality. Barro (2000) reports empirical support for what he calls the "popular theory" regarding the effects of globalization, not the predictions of classical trade theory: increased openness adversely affects income inequality in the LDCs. He speculates that relatively sophisticated groups in developing countries are better able to take advantage of the opportunities offered by global integration. Edwards (1998), however, found no link between openness and increasing income inequality in developing countries.

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<sup>6</sup> This argument has been used to explain the adverse effect of income inequality on growth (Alesina and Rodrik 1994; Persson and Tabellini 1994), but the evidence is unconvincing: the progressivity of tax rates is inversely correlated with inequality, contrary to the theory (Ferreira 1999).



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It is possible that the Stolper-Samuelson theorem is not sufficiently complex to capture the effects of trade on income inequality. A developing country's integration into the international economy may create enclaves of production that employ workers who are unskilled relative to workers in core countries but skilled relative to most others at home. The beneficiaries of globalization may see their incomes rise relative to their less skilled compatriots. This argument is, of course, central to the theory of dependent development. The effect of openness on an aggregate measure of income inequality like the Gini index would depend, therefore, on the relative strength of its impact on these two groups. Cooper (2001) also notes that Stolper and Samuelson's assumption of just two commodities and two factors of production is problematic. Theoretical extensions of the theory lead to such disparate results that, he concludes, no prediction can be made with confidence about the effect of trade on income inequality.

Dependency theorists were once interested in the effects of trade on inequality, but they defined their analyses more narrowly. It was not trade in general that mattered in the view of Galtung (1971) and Rubinson (1976) but the concentration of trade, especially exports, in a few commodities or with a few importing countries. Chan (1989) found no support for this view, and later quantitative work by dependency theorists emphasized foreign direct investment, not trade, as the mechanism of exploitation. "The most direct economic penetration by core nations of peripheral areas is through private investment by transnational corporations which directly own and control the process of production" (Chase-Dunn 1975, p. 721). The importance of FDI, rather than trade, was also emphasized by Bornschieer and Chase-Dunn (1985).

Structural aspects of national economies have been emphasized in recent research on income inequality. As noted earlier, Kuznets (1955) argued that the process of industrialization initially increases income inequality as workers move from the agricultural sector, where incomes are low, to industry where productivity and wages are higher. Thus, the greater the differential productivity between agriculture and industry the greater income inequality is expected to be. Bourguignon and Morrisson (1998) have proposed a measure of labor's productivity in industry relative to its productivity in agriculture; it is based on a comparison of agriculture's share of employment and of GDP. They report that countries with a dualistic economy—modern industry and primitive farming—have greater inequality.<sup>7</sup> Income inequality may also be related to the size of the agricultural sector. Kuznets (1955) argued that a secondary influence on the distribution of income during industrialization was the degree of income inequality in the agricultural and industrial sectors of the economy. Income inequality in agriculture was relatively low because most individuals were uniformly poor. There was greater differentiation within the industrial sector because the diversity of skills was greater. Nielsen (1994) reports that agriculture's share of GDP is associated with greater equality.

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<sup>7</sup> The formula for the relative labor productivity of industry is given in the Appendix.

The distribution of a country's population by age may also influence income inequality. A high proportion of people under age 15 is expected to increase inequality because population growth is greatest in low-income groups (Bollen and Jackman 1985; Muller 1988). In addition, a lot of youth increases the competition for employment among unskilled workers and lowers their wages relative to older, more skilled workers (Nielsen and Aldersen 1995; Higgins and Williams 2000). The influence of a large age cohort on relative incomes has been used for two decades to explain the effects of the baby boomers in the United States (Easterlin 1980). A young population also indicates a high population growth rate, which is associated with a lower rate of participation by women in the economy. The exclusion of women from the labor force should have the greatest adverse effect on the poorest households.

The accessibility of education may also influence income inequality. Countries with broad-based public education systems are expected to have more equal distributions of incomes (Bourguignon and Morrisson 1998), though Higgins and Williamson (1999) find little support for this view. Earlier studies found evidence that widespread participation in the military is associated with greater equality. Weede and Tiefenbach (1981) and Chan (1989) suggest that military training is an important source of education in less developed countries and a way of socializing youth to the norms of cooperation in complex organizations.

## 5 Results

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In this section, we assess the effects of globalization on the distribution of income within countries. In keeping with past research, we focus on the influence of foreign direct investment; but we also consider other measures of economic openness: the trade-to-GDP ratio and Sachs and Warner's (1995) assessment of the prevalence of protectionist policies. We estimate several models of income inequality, as measured by the Gini index. These tests incorporate the Kuznets (1955) curve, measures of the character of political institutions, and various aspects of the economy and society that have been emphasized in recent research. We use the latest data on inequality (Deininger and Squire 1996). We analyze 72 developed and less developed countries in various years, 1970-90, in our largest sample; and we conduct tests to ensure that the experience of the developing countries does not differ from that of the economically advanced countries. We also perform several tests of the effect of foreign direct investment on the share of income received by the poorest 20% of society. In most cases, we use ordinary least squares regression analyses of pooled cross-sectional and time-series data, following the example of Ravallion and Chen (1997) and Dollar and Kraay (2000).<sup>8</sup> We also report key tests using fixed-effects analysis with a separate indicator for each country. The data we use are described in detail in the Appendix.<sup>9</sup>

We present our simplest test of dependency theory in the first column of Table 2. We regress the Gini index of income inequality on the ratio of foreign direct investment to GDP, the natural logarithm of real per capita GDP and its square, and indicators that identify the geographical region in which each country is located. Contrary to dependency theory, a large stock of foreign investment is not significantly ( $p < .58$ ) related to the distribution of income in a country. The inverted U-shape of the curve identified by the estimated coefficients of real income and real income squared is consistent with Kuznets' theory; and the coefficients are individually ( $p < .008$  and  $p < .005$  respectively) and jointly quite significant ( $p < .001$ ). Income inequality is low among the poorest countries, rises as the average income increases, and then falls with further increases in income. The inflection point of the curve is \$2548 (1985 constant dollars). As we shall see, however, Kuznets' thesis only accounts for variation across countries; there is no evidence of an inverted U-shaped curve in the individual time series. Our results confirm previous studies showing that regional differences are important (Anand and Kanbur 1993; Higgins and Williamson 1999; Barro 2000; Dollar and Kraay 2000). Income inequality is unusually great in Latin America ( $p < .001$ ) and Africa ( $p < .001$ ).

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<sup>8</sup> Others average available data over a decade. Thus, observations for a country in, say, 1973, 1976, and 1977 would be averaged and regressed on independent variables drawn from the 1970s. As Dollar and Kraay (2000) note, this introduces uncertainty into the temporal sequence because an average based on values from early in a decade would be regressed on data from latter points in time.

Next, we add two political variables that might influence income inequality. The first is a simple indicator of whether or not a country had a socialist economy; the second is a count of the number of years a country has been democratic. Not surprisingly, socialist states have more equal distributions of income than other countries ( $p < .001$ ), the Gini index is 8.5 percentage points lower if a state is socialist. The longevity of democracy does not influence income inequality, however. These results are inconsistent with the work of Muller (1988) but in keeping with the research of others (Kohli et al. 1984; Bollen and Jackman 1985; Barro 2000; Chan 1989; Dollar and Kraay 2000).<sup>10</sup> Again, there is no evidence that foreign investment by multinational corporations ( $p < .73$ ) increases inequality. The log of real income and its square, controlling for political influences, are jointly significant at the .02 level.

Next, we add four variables that characterize the structure of a country's economy and its demographics. The first new variable is a gauge of the relative labor productivity (RLP) of the non-agricultural sector. RLP increases as the productivity of the manufacturing and service sectors increase relative to that of agriculture. When RLP is large, there is a clear indication of a dual economy: modern, efficient industry but relatively unproductive agriculture. We also include a measure of the importance of agriculture to a nation's economy: the percentage of GDP represented by the agricultural sector. The percentage of children of the appropriate age enrolled in secondary schools and the percentage of the population under age 15 are also included.

The results of this analysis are reported in column 3 of Table 2. As before, there is no evidence that foreign investment has any effect on income inequality ( $p < .70$ ). The distribution of income is influenced by the economic importance of agriculture ( $p < .02$ ) and its relative productivity ( $p < .01$ ), as Bourguignon and Morrisson (1998; also, Nielsen 1994; Nielsen and Alderson 1995) have suggested, but not by the percentage of the population under 15 ( $p < .88$ ) or the enrollment rate in secondary schools ( $p < .60$ ). In the last column of Table 2, we drop the insignificant variables and re-estimate the coefficients. The results change little. In both columns 3 and 4, there is support for the Kuznets curve. Although the coefficients of real income and its square are not individually significant, jointly they are unlikely to be equal to zero ( $F = 4.6, p < .01$  in column 4).

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<sup>9</sup> Our data and the programs used to generate the results reported in the tables will be made available upon publication.

<sup>10</sup> We substituted Jagers and Gurr's (1995, 1996) measure of institutional democracy for the count of the years that a country had been democratic, but the results were unchanged.

## 6 Tests of Robustness

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In Table 3, we report four additional analyses designed to test the robustness of our results thus far. First, we re-estimate the last analysis in Table 2—our best, most parsimonious account of income inequality—using a fixed-effects model. A separate indicator is included for each country to capture unique characteristics that might influence the distribution of income. Only variables that change over time can affect variation in the Gini index in a fixed-effects analysis, so the socialist variable and regional indicators drop out. The results in column 1 confirm that foreign investment does not significantly affect income inequality. The FDI-to-GDP ratio is closer to statistical significance than in the pooled analyses ( $p < .09$ ), but it has little substantive impact. An increase of one standard deviation in foreign investment (.120) is associated with a rise of less than one percentage point in the Gini index of inequality ( $4.68 * .120 = .562$ ). This is small compared to the standard deviation in the Gini index (9.57 percentage points). Nor is there any evidence in this analysis that income inequality rises and falls with average real incomes. The signs of the estimated coefficients for income and its square are inconsistent with Kuznets' inverted U-curve, and they are individually and jointly insignificant ( $F = .51, p < .60$ ).<sup>11</sup> Bourguignon and Morrisson's (1998) measure of relative labor productivity is the only variable that is statistically significant in the fixed-effects model ( $p < .02$ ). Indeed, the 68 country indicators account for 90% of the variance in the Gini index. This is a clear indication that, as Dollar and Kraay (2000) also conclude, we really know little about the causes of income inequality within countries.

In the second column of Table 3, we present evidence that the effect of foreign investment on inequality in developing countries is the same as it is in developed ones. In this pooled estimation, we include an interactive term (the logarithm of real income times the FDI-to-GDP ratio). This test is designed to reveal whether the effect of foreign investment varies with the average real income of the countries, as Borschier and Chase-Dunn (1985) have argued.<sup>12</sup> The estimated coefficient of the interactive term is, however, far from statistical significance ( $p < .50$ ). There is no evidence, then, that a large presence of multinational corporations adversely affects income inequality in less developed countries.

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<sup>11</sup> The Kuznets curve implies that economic growth will affect rich and poor countries differently. Growth in poor countries is expected to increase inequality; it should reduce inequality in rich countries. Indeed, the poorer a country is, the more growth should increase inequality. Similarly, the further a rich country is from the inflection point of the Kuznets curve, the more inequality should be reduced by economic growth. To test this, we created two interactive terms using countries' economic growth rates over the previous five years. One was constructed using growth and the deviation of a country's income from the inflection point identified in column 1, Table 2. For countries whose income was less than the peak of the Kuznets curve,  $PoorGrowth = Growth * |AverageIncome - InflectionPoint|$ ;  $PoorGrowth = 0$  for countries whose income is greater than the inflection point. The second measure (RichGrowth) was constructed in analogous fashion: growth times the degree of richness for rich countries, and zero otherwise. We then regressed the Gini index on these two interactive terms and the regional indicators. Neither term was near statistical significance, and the signs were contrary to expectations. These results are consistent with Dollar and Kraay (2001) who report that economic growth is not biased against low-income groups in poor countries.

<sup>12</sup> As Borschier (1981) noted, it is preferable to use an interactive term to estimate the effect of FDI in developing countries, rather than perform a separate analysis with just these cases. See also Borschier and Chase-Dunn (1985, pp. 124-6).

In the last two columns of Table 3, we substitute two alternative measures of globalization one at a time for the FDI-to-GDP ratio. In column 3, we use the trade-to-GDP ratio; and in column 4, Sachs and Warner's (1995) measure of free trade policies is introduced. The trade-to-GDP ratio indicates the economic importance of exports and imports relative to a country's gross domestic product. It is well known that this measure is influenced both by political choices and by fundamental characteristics of a country, viz., its size and geographical location. Sachs and Warner have developed a binary indicator that identifies states that have adopted policies promoting free trade and integration into the international economy. They have categorized countries as open or closed based on their average tariff rates, the prevalence of non-tariff barriers, black market exchange rates, the existence of a socialist economic system, and whether the state holds a monopoly of major exports. The results reported in the last two columns of Table 3 show that income inequality is unaffected by either of these alternative measures of globalization. Neither the trade-to-GDP ratio ( $p < .53$ ) nor Sachs and Warner's measure of open economic policies ( $p < .57$ ) approaches statistical significance.<sup>13</sup>

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<sup>13</sup> As with the ratio of FDI to GDP, we added an interactive term with the logarithm of real income to the regressions with the trade-to-GDP ratio and Sachs and Warner's (1995) index of economic openness. In both cases the interactive term was insignificant. Thus, contrary to Barro (1999), we find no evidence that economically important trade or governmental policies associated with free trade adversely affects income inequality in developing countries. Nor is there support for the prediction of modern trade theory that trade will increase inequality in the developed countries and decrease it in LDCs.

## **7 Testing for Marginalization of the Poor**

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As we noted earlier, dependency theorists have not agreed on the effects of a large presence of multinational corporations in developing countries. Those who subscribe to the theory of dependent development (Portes 1976; Cardoso and Faletto 1979; Evans 1979) expect foreign investment to foster economic growth, for the reasons advanced by most economists, but development to be distorted. In this view, multinational corporations create enclaves linked to the international economy, where a limited number of workers earn relatively good wages, while the poor in remote regions of the developing country are increasingly marginalized. The net effect of these two influences could be, at least in theory, a decline in the Gini index, a summary measure of inequality, at the same time that the condition of the poorest segment of society deteriorated. For this reason, we analyze the effect of foreign investment on the share of income of the poorest 20% of society specifically.<sup>14</sup> Deininger and Squire (1996) recommend supplementing analyses of the Gini index with tests using the quintiles' shares of income. Accordingly, we report in Table 4 three additional tests of the effect of the FDI-to-GDP ratio, using the share of income received by the poorest quintile.

In column 1, we use the best specification from our previous analyses (column 4, Table 2), simply substituting the lowest quintile's share of income for the Gini index as the dependent variable. The results indicate that there is no statistically significant effect of foreign investment ( $p < .45$ ) on the poor's share of national income. Nor is there evidence of a Kuznets curve; the log of real income and its square are jointly ( $p < .68$ ) as well as individually insignificant. The only significant influences are the indicator of a socialist economy ( $p < .001$ ), and the relative labor productivity of the non-agricultural sector ( $p < .05$ ). The poorest quintile in a socialist country receive 1.13 percentage points more income than in a capitalist country *ceteris paribus*. This is more than half the standard deviation of the lowest quintile's share of income (2.01 percentage points), though the poor in socialist countries presumably lose more from sharing in a smaller economic pie than they gain from having a larger slice of it. An increase of one standard deviation in RLP has only a modest effect, lowering the poor's share of income by 0." percentage points.

In the second column of Table 3, we report the results of a fixed-effects test. As before, we include a separate indicator for each country. Here the estimated coefficient of the ratio of foreign investment to GDP is negative (-1.30) and significant at the .04 level, but the effect of a one standard-deviation increase is substantively small: -0.19 percentage points ( $-1.30 * .120 = .$ ),

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<sup>14</sup> Borschier and Chase-Dunn (1985, p. 123) suggest that roughly 20 percent of the population in a typical peripheral country are integrated into the world economy, with the rest being marginalized. This, too, suggests that analyses of the Gini index should capture any adverse effect of a large multinational presence.

only 8% of the standard deviation of the lowest quintile's share. The amount of variance explained confirms the limits of our understanding of the determinants of the income of the poor. The overall R-square is .07; within the time series, it is .04.

Finally, we replicate the analysis used earlier to ensure that the effects of foreign investment do not differ for the developing and the developed countries. As seen in the third column of Table 3, the interactive term (the logarithm of real income \* the FDI-to-GDP ratio) is not statistically significant ( $p < .17$ ).



## **8 Conclusion**

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In this paper, we have assessed the effect of globalization on the distribution of income within countries. In keeping with past research on dependency theory, we focused on the influence of foreign direct investment. We relied mainly on pooled cross-sectional and time-series analyses of Deininger and Squire's (1996) data on income inequality, using the information on foreign investment recently released by UNCTAD (2000) and the World Bank (2000). In our largest sample, we have 383 observations for 72 developed and less developed countries in various years, 1970-90. We used several different specifications, incorporating the Kuznets (1955) curve, measures of the character of political institutions, and various aspects of the economy and society that have been emphasized in recent research on income inequality. In addition to our analyses of the Gini index, a summary measure of inequality, we also performed several tests of the effect of foreign investment on the share of income received by the poorest 20% of society.

Our results are easy to summarize. Globalization has little effect on the distribution of income within countries. The ratio of foreign direct investment to gross domestic product is unrelated to the Gini measure of income inequality in all eight of our tests. Foreign investment does not adversely affect income inequality in either developing or developed countries. The share of income received by the poorest 20% of society is uncorrelated with the economic importance of foreign investment in two of three tests, and where the effect is statistically significant it is unimportant substantively. Nor are alternative measures of economic openness—the trade-to-GDP ratio and Sachs and Warner's (1995) measure of free trading policies—associated with greater inequality. In sum, neither a large presence of multinational corporations nor extensive commercial ties to the world economy worsen income inequality generally or increase the marginalization of the poor in particular.

The results we have reported confirm that foreign investment is good for the poor in developing countries. Using the latest data on foreign direct investment, we find no evidence that economic growth in developing countries is adversely affected as the stock of FDI relative to GDP increases. Rather, an increase in foreign investment raises average incomes in developing countries; indeed, FDI is more productive than capital from domestic sources. It also encourages investment by local entrepreneurs (de Soysa and Oneal 1999). If foreign investment directly and indirectly increases average income and does not affect the distribution of income, foreign investment increases the income of the poor. Our results are consistent with Dollar and Kraay's (2000, 2002) research regarding the effects of trade.

We find limited support in our analyses of income inequality for the Kuznets (1955) curve. Inequality is related in a curvilinear fashion to the average real income, as Kuznets expected, but only in cross-national estimations. There is clear evidence in our pooled tests that socialist states have more equal distributions of income, though the evidence of the 1980s and 1990s indicates that this comes at the expense of growth. Only the relative labor productivity of the non-agricultural sector is significantly associated with inequality in both pooled and fixed-effects analyses: a dual economy—modern industry and services and backward agriculture—has high inequality (Bourguignon and Morrisson 1998). But this is hardly surprising. If there is sectoral income inequality, there inevitably will be inequality among households. Our fixed-effects analyses, which address only variation through time, make clear the limits of our understanding of income inequality, especially regarding the well-being of the poor. We know much more about what does not affect the distribution of income than what does.

## **Appendix: Definitions of Variables and Sources of Data**

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### *Dependent variable: Income Inequality*

In tables 2 and 3 we examine income inequality using the Gini coefficient, the most commonly used measure. The Gini index equals zero if everybody has the same income and 100 if one person possesses everything. In table 4 our dependent variable is the poorest quintile's share of income. Both measures are taken from the Deininger and Squire (1996) data set, which contains a subset of observations that meet acceptable standards of data collection (e.g., all observations must be based on nationwide surveys and a comprehensive coverage of income sources). We restrict our sample to these high quality cases.

Using the method adopted by Dollar and Kraay (2000), we corrected Deininger and Squire's Gini and quintile estimates to account for differences in the characteristics of the surveys: income versus expenditures, gross income versus net of taxes, and household versus individual unit of measurement.

### *Independent variables: FDI-to-GDP ratio*

We estimated the value of foreign direct investment in each year using UNCTAD's (2000) revised data for the stock of FDI in 1980 and data on flows from UNCTAD (2000) and the World Bank (2000). To calculate annual values back to 1970 and forward to 1990, we converted foreign investment flows to constant dollars, accounted for depreciation using the accelerated method with a half-life of 10 years, and subtracted or added flows from the stock of foreign direct investment in 1980. We then divided the average value for each year by the country's real GDP (Summers et al. 1995).

### *Income*

We test for the inverted U-shaped Kuznets curve with the natural logarithm of real GDP per capita and its squared term based on purchasing power parity in international prices (Summers et al. 1995). In the tests reported in footnote 11, we use the growth rate of real GDP per capita, which we averaged over the previous five years.

*Regional dummy variables*

The regional identifications of the Penn World Tables (Summers et al. 1995) were used except that the United States and Canada were added to Europe so that the Latin American countries would be uniquely identified by the code for the Western Hemisphere.

*Democratic experience and socialist countries*

Our democracy scores are taken from the Polity III data set (Jagers and Gurr 1995) which contains annual democracy and autocracy scores, based on 11-point scales. A summary score for each country-year was calculated by subtracting a state's autocracy score from its democracy score, as Jagers and Gurr recommend. Thus, this variable can range from +10 for countries that are purely democratic to -10 for purely authoritarian countries. The years of democratic experience were calculated by counting the number of years that the country had been a "coherent democracy," when the democracy-autocracy score was greater than +6. The dummy variable that identifies the socialist states is from Barro (1991).

*Economic dualism and the size of the agricultural sector*

We use two variables to account for the structure of a country's economy. The first is Bourguignon and Morrisson's (1998) measure of relative labor productivity (RLP) in agriculture with reference to the rest of the economy. This is a gauge of economic dualism and accounts for differences in productivity between the agricultural and the manufacturing and service sectors of an economy. RLP is defined as follows:

$$RLP = \frac{(1 - agrGDP) * agremp}{agrGDP * (1 - agremp)}$$

where *RLP* is relative labor productivity, *agrGDP* is agriculture's share of GDP and *agremp* is its share of employment. Data on the share of agriculture in employment is available from the UN Food and Agricultural Organization's web site ([apps.fao.org](http://apps.fao.org)), data on the agricultural share of GDP is available from the World Bank's *World Tables* (1989-90, 1994). As in Nielsen (1994), we also control for the size of the agricultural sector, where income is expected to be more equally distributed. Controlling for sector dualism, the size of the agricultural sector should be negatively related to income inequality. The size of the agricultural sector is operationalized as agriculture's share of GDP.

## The Effect of Foreign Investment on Economic Development and Income Inequality

### *Age structure of the population and school enrollment*

We include in some of our analyses a control for the share of total population of those under age 15. These data can be found on the World Bank's web site ([devdata.worldbank.org/hnpstats](http://devdata.worldbank.org/hnpstats)). The percentage of children enrolled in secondary schools is taken from UNESCO (various years), which provides data in five-year intervals. We interpolated data for each year using the five-year estimates from 1970-1990.

### *Trade*

Trade is an alternative to foreign investment as an indicator of globalization. Our data regarding trade volume are taken from Summers et al. (1995). Our measure of economic openness equals exports and imports divided by GDP. We also employ the measure of free-trade policies created by Sachs and Warner (1995). They categorize countries as closed or open by taking into account the extent of non-tariff barriers, average tariff rates, black market exchange rates, the existence of a socialist economic system, and whether a state has a monopoly of major exports. A country is considered open if none of the above criteria apply.

## Tables

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Table 1.

Replication of de Soysa &amp; O Neal (1999) with new estimates of FDI stock, 1980-90

Dependent variable = per capita economic growth

	(1)	(2)	
Foreign investment rate 1980-90	.094** (.030)	.11*** (.03)	
Domestic investment rate 1980-90	.26* (.12)	.29** (.11)	
Ln Size (GDP)	.59* (.24)	.31 (.27)	
Trade to GDP 1980-90	.0072 (.0069)	-.0027 (.0073)	
Ln GDP/pc 1980	-2.8* (1.2)	-2.4 (1.2)	
Human capital 1980	.79* (.38)	.05 (.48)	
Foreign penetration (FDI k/GDP) 1980	.028 (.012)	.038 (.027)	
Domestic penetration (Domestic k/GDP) 1980	.0087 (.0119)	.013 (.011)	
Human capital x Foreign investment rate		.021 (.023)	
Human capital x Domestic investment rate		.090 (.047)	
Constant	8.7 (6.9)	8.6 (6.8)	
R <sup>2</sup>	.49	.52	
N	84	84	

Note: Numbers in parentheses are standard errors.

\* p &lt; .05

\*\* p &lt; .01

\*\*\* p &lt; .001 (two-tailed tests)

## The Effect of Foreign Investment on Economic Development and Income Inequality

Table 2.

Estimated Coefficients from the Regression of the Gini Index of Income Inequality on Foreign Direct Investment, 1970-1990

	(1)	(2)	(3)	(4)
FDI/GDP	1.60 (2.89)	1.04 (2.99)	1.02 (2.61)	0.83 (2.77)
Real per capita income (ln)	49.10** (18.09)	38.63 (20.36)	16.94 (17.36)	15.97 (17.82)
Real per capita income squared	-3.13** (1.09)	-2.52* (1.25)	-1.41 (1.03)	-1.41 (1.06)
Socialist state	-	-8.47*** (2.16)	-10.90*** (2.07)	-11.04*** (1.46)
Years of democracy	-	-0.014 (0.028)	-	-
Agricultural share of GDP	-	-	-0.30* (0.13)	-0.31* (0.12)
Relative labor productivity	-	-	0.75* (0.29)	0.68*** (0.099)
Population under 15	-	-	0.027 (0.172)	-
Secondary school Enrollment rate	-	-	-0.026 (0.049)	-
Africa dummy	15.39*** (3.51)	15.35*** (3.69)	9.33*** (2.51)	9.74*** (2.61)
Latin America dummy	9.24*** (2.65)	8.68** (2.85)	6.16 (3.14)	6.98* (2.90)
Asia dummy	-1.45 (2.47)	-1.89 (2.64)	-3.02 (2.19)	-2.92 (2.40)
Oceania dummy	-0.17 (2.36)	0.11 (2.27)	0.94 (2.31)	1.19 (2.22)
Constant	-148.69* (74.05)	-103.59 (82.12)	3.06 (74.92)	10.57 (75.13)
R <sup>2</sup>	.60	.62	.72	.74
N	383	377	322	325

Note: Numbers in parentheses are standard errors.

\* p < .05

\*\* p < .01

\*\*\* p < .001 (two-tailed tests)

Table 3.

Estimated Coefficients from the Regression of the Gini Index of Income Inequality on Foreign Direct Investment and Trade, 1970-1990

	(1) Fixed effects	(2) OLS	(3) OLS	(4) OLS
FDI/GDP	4.68 (2.77)	34.01 (46.97)	-	-
FDI* real per capita income	-	-3.99 (5.84)	-	-
Trade/GDP	-		-1.38 (2.15)	-
Sachs & Warner openness				0.85 (1.49)
Real per capita income (ln)	-6.13 (15.35)	14.83 (17.43)	10.96 (16.21)	20.07 (17.39)
Real per capita income squared	0.25 (0.85)	-1.33 (1.04)	-1.11 (0.96)	-1.61 (1.03)
Socialist state		-10.94*** (1.43)	-14.39*** (2.01)	-12.13*** (1.76)
Agricultural share of GDP	-0.17 (0.14)	-0.31** (0.12)	-0.30* (0.13)	-0.24 (0.13)
Relative labor productivity	1.02* (0.41)	0.67*** (0.10)	0.74*** (0.12)	0.71*** (0.10)
Africa dummy		9.77*** (2.65)	10.18*** (2.44)	9.84*** (2.67)
Latin America dummy		6.89* (2.90)	7.30** (2.59)	7.90** (2.73)
Asia dummy		-2.84 (2.48)	-2.86 (2.41)	-2.41 (2.42)
Oceania dummy		1.30 (2.20)	1.44 (2.00)	1.19 (1.91)
Constant	74.34 (70.60)	14.50 (73.42)	30.90 (69.46)	-11.58 (74.64)
R <sup>2</sup>		.74	.78	.74
Overall R <sup>2</sup>	.30			
Within R <sup>2</sup>	.07			
Between R <sup>2</sup>	.33			
N	325	325	343	317

Note: Numbers in parentheses are standard errors.

\* p < .05

\*\* p < .01

\*\*\* p < .001 (two-tailed tests)



## The Effect of Foreign Investment on Economic Development and Income Inequality

Table 4.

Estimated Coefficients from the Regression of the Poorest 20%'s Share of Income on Foreign Direct Investment, 1970-1990

	(1) OLS	(2) Fixed effects	(3) OLS
FDI/GDP	-0.61 (0.79)	-1.30* (0.64)	-24.96 (17.08)
FDI* real per capita income	-	-	2.96 (2.13)
Real per capita income (ln)	-2.49 (5.77)	-3.10 (3.74)	-1.50 (5.89)
Real per capita income squared	0.13 (0.35)	0.16 (0.21)	0.058 (0.37)
Socialist state	1.13*** (0.33)		1.10*** (0.32)
Agricultural share of GDP	-0.70 (3.36)	-2.67 (3.32)	-0.57 (3.21)
Relative labor productivity	-0.077* (0.038)	-0.14 (0.096)	-0.075* (0.036)
Africa dummy	-2.15** (0.78)		-2.10** (0.76)
Latin America dummy	-3.32*** (0.86)		-3.23*** (0.81)
Asia dummy	-0.80 (0.70)		-0.79 (0.69)
Oceania dummy	-1.20 (0.57)		-1.29 (0.55)
Constant	19.26 (23.52)	21.77 (17.02)	15.68 (23.67)
R <sup>2</sup>	.54		.56
Overall R <sup>2</sup>		.07	
Within R <sup>2</sup>		.04	
Between R <sup>2</sup>		.03	
N	293	293	293

Note: Numbers in parentheses are standard errors.

\* p < .05      \*\* p < .01      \*\*\* p < .001 (two-tailed tests)

Table 5.  
Summary Statistics of Variables Used in Tables 2-4

	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
Gini index of income inequality	383	42.07	9.57	25.47	77.43
Poorest quintile's share of income	342	0.0635	0.0201	0.0180	0.1097
FDI/GDP	383	0.0779	0.1201	0	1.5845
Real per capita income (ln)	383	8.531	0.919	6.178	9.803
Years of democracy	377	48.20	47.70	0	181
Population under 15, %	366	31.20	9.79	16.51	49.40
Secondary school enrollment rate	375	64.55	27.93	2	119
Agricultural share of GDP, %	334	13.16	12.34	0.33	58.84
Relative labor productivity	325	3.36	3.76	0.93	39.88
Trade/GDP	374	0.482	0.292	0.035	1.513
Sachs & Warner (1995) openness	353	0.654	0.476	0	1

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