

# The Effect of Globalization on National Income Inequality\*

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## ABSTRACT

We assess the effect of globalization on income inequality within countries, focusing on the influence of accumulated foreign direct investment stocks. We analyze data on inequality and foreign investment for 72 countries, 1970-90, incorporating in our tests the Kuznets (1955) curve, the character of political institutions, and various other aspects of the economy and society emphasized in previous research. Our results indicate that globalization does not increase national income inequality. The ratio of foreign direct investment to gross domestic product is unrelated to the distribution of incomes in both developing and developed countries. The share of income received by the poorest 20% of society also is unaffected by foreign investment. 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 income inequality. If foreign investment increases average incomes in developing countries, as recent research indicates, and does not increase inequality, it must benefit all strata of these societies, including the poor.

Recent research indicates that globalization promotes the growth of average incomes in developing countries (Borensztein, Gregorio, and Lee

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1998; de Soysa and O Neal 1999; UNCTAD 1999; Ram and Zhang 2002; Dollar and Kraay 2002; Bhalla 2002), but the standard of living of the poor in these societies could decline if integration into the global economy adversely affects the distribution of income. Indeed, a number of academics have concluded that the fears of the anti-globalization movement are justified: multinational corporations increase income inequality in developing countries, further marginalizing the poorest of the poor (Korzeniewicz and Moran 1997; Alderson and Nielsen 1999; Milanovic 1999; Mazur 2000; Kentor 2001; Reuveny and Li 2003). We reassess these claims by examining the effects of economic openness on income inequality within countries. We pay special attention to the influence of foreign direct investment on the distribution of income in developing countries, using data recently published by UNCTAD (2000) and the World Bank (2000).

Our results are easily summarized. We find no evidence to suggest that a large stock of foreign investment (or economically important trade) increases inequality in either developing or developed countries. Tests focused on the poorest 20% of people in each country confirm this result. Economic openness does not significantly affect the distribution of income in the periphery nor decrease the lowest quintile's share of national income. If foreign investment and trade promote economic growth and do not shift income to richer segments of society in the process, it must be good for the poor in developing countries.

In the following section, we review previous research and various theoretical arguments on the effect of globalization on income inequality, and we justify our focus on the stock of foreign investment as the principal measure of a country's integration into the global economy and our method of calculating this variable. Next we identify other influences that might affect the distribution of income within countries. This allows us to estimate the effect of foreign investment on inequality in a number of specifications in section three, ensuring that the omission of a key variable is not biasing our analyses. We present our conclusions in the final section.

### **The effect of globalization on income inequality**

The process of globalization has long been of interest to social scientists in several disciplines. Early theories of neo-colonialism, advanced by sociologists especially, argued that multinational corporations retard economic growth in developing countries (Baran 1956; Chase-Dunn 1975; Frank 1969). Dependency on foreign investment was said to create an opportunity for exploitation that adversely affects economically and polit-

ically weak host countries. Later, dependency theorists recognized that some developing countries experience rapid development even when integrated into the global economy; but economic growth in these cases was said to be distorted and inegalitarian, adding to misery.<sup>1</sup> Portes (1976: 75 also Cardoso and Faletto 1979), for example, claimed that “sustained economic growth has been accompanied by rising social inequalities.” Multinational corporations were thought to increase income inequality in part by producing enclave economies, where relatively well-paid workers were surrounded by a larger number of marginalized poor. More importantly, foreign capitalists were said to prevail upon *comprador* elites to adopt policies that favored capital at the expense of labor.<sup>2</sup> Multinational corporations were accused of using their economic power to create oligopolistic markets and subvert efforts at egalitarian development.

Early empirical tests of dependency theory by Galtung (1971) and Rubinson (1976) found that the existence of a weak state and a concentration of exports in a few commodities or with a few developed countries were associated with increased inequality in the periphery, but Chan (1989) was unable to corroborate these findings. Later, the role of foreign direct investment (FDI) was emphasized by dependency theorists because “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 1975:721). Statistical analyses provided substantial support for this view (Bornschiefer, Chase-Dunn, and Rubinson 1978; Kohli et al. 1984; Bornschiefer and Chase-Dunn 1985). Indeed, the economic importance of foreign investment, indicated by the ratio of foreign investment stock to gross domestic product (GDP), was the best predictor of income inequality in developing countries in Chan’s (1989) comprehensive tests of prevailing theories. For dependency theorists, it was the accumulated effects of the multinationals’ penetration over time, not trade or volatile

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<sup>1</sup> As noted earlier, recent research indicates that globalization promotes growth in developing countries. Because UNCTAD made significant revisions in its data on foreign investment from 1995 to 2000, we re-estimated the analyses reported in de Soysa and Oneal (1999), which were based on the earlier data. The results confirm our earlier findings: larger foreign investment flows increase the growth rate of GDP per capita, foreign investment is more productive dollar-for-dollar than capital from domestic sources, and, contrary to dependency theory, a large stock of FDI does not adversely affect growth.

<sup>2</sup> Bornschiefer, Chase-Dunn, and Rubinson (1978:665) argued 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.” This essentially involved the suppression of organized labor and its political allies.

short-term flows of capital that mattered (Bornschiefer and Chase-Dunn 1985). Thus, the relationship between foreign investment and inequality seemed “one of the most robust quantitative, aggregate findings available” in sociology and political science (Evans and Timberlake 1980:532).<sup>3</sup> Recent analyses reinforce the view that economic dependency on foreign direct investment increases income inequality (Alderson and Nielsen 1999; Kentor 2001; Reuveny and Li 2003).<sup>4</sup>

Neo-classical economists have largely ignored the effect of foreign investment on the distribution of income within countries. Solow (1956) suggested that foreign capital reduces the return on investment in a host country and raises the productivity of labor and hence the real wage. Since the ownership of capital is more concentrated than income from labor, this should equalize incomes and raise their average, at least in the absence of substantial restrictions on trade (Cooper 2001). Foreign investment (and trade) may also have beneficial effects by increasing competition in domestic markets. Profit margins are reduced and the prices of commodities lowered, redistributing wealth from producers to consumers (Mehlkop 2002). Moreover, FDI can benefit a wider class of entrepreneurial talent in developing societies by increasing the sources of capital and encouraging the development of financial markets. Restrictions on economic openness favor rent-seeking and create opportunities for corruption (Weede 2000). All these influences suggest that higher levels of foreign investment should reduce income inequality.

The effects of foreign direct investment on income inequality may depend, however, on the policies adopted by host countries. Countries with high levels of inequality that do not change policies that advantage

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<sup>3</sup> The determinants of foreign investment, as well as its consequences, have received the attention of those interested in the process of globalization (O Neal and O Neal 1988; O Neal 1994; Jensen 2003; Li and Resnick 2003).

<sup>4</sup> Reuveny and Li (2003) find that FDI flows as a fraction of GDP averaged over a decade correlate positively with income inequality. The flow of foreign investment, however, may be volatile and is a weak measure of multinational corporations' influence on a host economy. Average flows do not distinguish those countries continuously open to global forces; a country receiving FDI equal to 10% of GDP in each of 10 years would have the same score as a country receiving the full amount in the first year and 0% for the remaining nine years. Alderson and Nielsen (1999) use the stock of FDI, the measure that we also advocate. However, they rely upon Ballmer-Cao and Scheidegger (1979) and UNCTAD (1995) for their data on foreign direct investment. Although Ballmer-Cao and Scheidegger warned that their data should be “used with caution” (p. 122), and UNCTAD revised its data significantly after 1995. In addition, our use of FDI flows to calculate stocks in various years is preferable to Alderson and Nielsen's interpolating between estimates of stocks, especially when these estimates are from different sources.

established elites could see a perpetuation or expansion of inequality because of what Birdsall (2002) calls “dynastic traps”. On the other hand, Dollar and Kraay (2002) report that in developing countries there is almost a one-to-one relationship between the growth of average incomes and increase in the incomes of the poorest quintile. If foreign investment, like capital from domestic sources, simply promotes growth, then the poor should benefit proportionately.

Thus, the effect of foreign investment on the distribution of income in developing countries seems uncertain. FDI may increase inequality by reinforcing the power of privileged groups and creating enclaves of well-paid employees of the multinational corporations surrounded by marginalized poor. Alternatively, increased competition in domestic markets as a result of globalization could benefit consumers and less skilled workers in developing countries and reduce rent-seeking, thereby contributing to greater equality. Finally, these positive and negative effects of globalization might cancel out, or the net effect depend upon the policies of host countries. As Caves (1996:115) has suggested, “the distributional consequence of foreign investment in the long run remains a strictly unsettled issue.”

Economists have more thoroughly considered the effect of trade on the distribution of incomes within countries. According to neo-classical theory, free trade should decrease inequality in developing countries because they have a comparative advantage in unskilled labor and trade increases the income of the factors of production used intensively by exporters. At the same time, inequality should increase in core countries where skilled workers are the primary beneficiaries. These straightforward conclusions may not hold, however, if more than two commodities and two factors of production are involved. Extensions of the Stolper-Samuelson theorem lead to such disparate results that the effect of trade on inequality is unpredictable, Cooper (2001) concludes. Recent empirical results are consistent with this view. Borsu and Glejser (1992) and Reuveny and Li (2003) report that the trade-to-GDP ratio is associated with more equitable income distributions in both core and peripheral countries; Edwards (1998), Higgins and Williamson (1999), and Mehlkop (2002) find no relation between trade and national income inequality; and Barro (2000) reports that economically important trade adversely affects inequality in developing nations.

### **Other sources of income inequality**

The most prominent theory of income inequality was advanced by Kuznets (1955), who suggested that there is an inverted U-shaped curve

relating income inequality within countries to their average incomes. Kuznets noted that, at the beginning of the Industrial Revolution, most people farmed, an occupation characterized by uniformly low incomes. As people in Britain, Germany, and the United States moved to the cities, inequality initially increased because migrants earned higher wages in industry. Over time, wages in agriculture also rose as the supply of laborers in that sector declined. Thus, as industrialization progressed, incomes again became relatively equal but at a higher level. Collective bargaining and organized political action, facilitated by the character of urban life, reinforced this demographic process. Kuznets suggested that economic development might similarly affect the distribution of income in peripheral countries in the contemporary period. A number of studies have found support for Kuznets' theory (Weede and Tiefenbach 1981; Muller 1988; Higgins and Williamson 1999; Barro 2000; Bhalla 2002; Reuveny and Li 2003); but others have been contradictory or equivocal, especially in the analysis of time-series (Chan 1989; Anand and Kanbur 1993; Ravallion and Chen 1997; Deininger and Squire 1998).

Of course, the effect of industrialization, like that of globalization, depends in part on the policies adopted by governments. Socialist states make equality a primary objective of policy. Democracies, too, are often thought to favor more equal incomes. As long as the median voter earns less than the national average, democratic leaders may be responsive to a demand for greater equality (Alesina and Rodrik 1994; Persson and Tabellini 1994; Weede 1997). The extent to which democracies might adopt policies to reduce inequality depends on the objective being pursued, however: equality before the law, equal opportunity, or equality of outcomes. Even if democratic governments do try to reduce inequality, the process may operate gradually and take time to secure its result, which may account for the lack of support for the simple hypothesis that democracies have more equal income distributions than do non-democratic countries (Kohli et al. 1984; Bollen and Jackman 1985; Barro 2000; Dollar and Kraay 2000; Reuveny and Li 2003). Muller (1988) reports that older democracies, but not newer ones, are more egalitarian than are non-democratic societies, though Chan (1989) and Weede (1989, 1990) cast doubt on this conclusion, too.

Structural aspects of national economies – what Aldersen and Nielsen (1999) call an internal-developmental model – have been emphasized in recent research on income inequality. If Kuznets (1955) is right, the initial increase in inequality that results from industrialization should be greater if there is a large difference in the productivity of agricultural and industrial workers. Indeed, countries with a dualistic economy – modern industry and less technologically advanced farming – do have

greater inequality (Nielsen 1994; Nielsen and Alderson 1995; Bourguignon and Morrison 1998; Alderson and Nielsen 1999). Incomes are also expected to be more unequal when agriculture's share of national economic production is small. Inequality is relatively low within the agricultural sector because the skills of farmers are more uniform compared to the diversity in industry; hence, the larger the industrial sector, the greater is income inequality within a nation.

The distribution of a country's population by age may also be important (Easterlin 1980; Higgins and Williamson 1999). A high proportion of children relative to adults should increase inequality because the birth rate is greatest among the poor and the poor consume a larger portion of their income than the rich (Bollen and Jackman 1985; Muller 1988; Nielsen and Alderson 1995; Alderson and Nielsen 1999). In addition, an abundance of youth increases competition for employment among unskilled workers and lowers their wages relative to older laborers. A young population also indicates a high population growth rate, which is associated with limited economic and political participation by women – an effect that should be most adverse for the poor.

Finally, income inequality is often thought to be affected by the accessibility of education. Countries with broad-based public education are expected to have more equal distributions of incomes (Nielsen and Alderson 1995; Bourguignon and Morrison 1998; Alderson and Nielsen 1999), though Higgins and Williamson (1999) find little support for this hypothesis. Earlier, Weede and Tiefenbach (1981) and Chan (1989) reported that widespread participation in the military is associated with greater equality in peripheral countries. Military training was thought to be an important source of education in less developed countries, but the benefit of military participation has not proven robust (Weede 1993).

## Results

In assessing the consequences of globalization for the national distribution of income, we focus on the effect of foreign direct investment using regression analyses of pooled time-series for an unbalanced sample of 72 countries with about five observations per country on average over the period 1970-90. This allows us to make cross-sectional comparisons among the various countries and also to trace developments over time. The economic importance of foreign investment, indicated by the FDI stock-to-GDP ratio, best captures the influence of multinational corporations in a host economy because it indicates the strength of the historically accumulated weight of MNCs' political and economic power. We also consider, however, the effects on inequality of trade-based

measures of economic openness: the trade-to-GDP ratio and Sachs and Warner's (1995) indicator of free-trade policies. Our tests directly measure the influence of multinational corporations – the principal agents of globalization – on inequality in host countries. Several recent studies (Korzeniewicz and Moran 1997; Milanovic 1999; Sala-i-Martin 2002; Bhalla 2002; Bourguignon and Morrison 2002; Firebaugh and Goesling 2004) have inferred the consequences of globalization by comparing a period when the international economy was less integrated to a later time when globalization had advanced. We test the consequences of globalization for individual countries and not its aggregated effects in different periods of time. In our tests, we incorporate the Kuznets (1955) curve, the character of political institutions, and various aspects of the economy and society that have been emphasized in previous research.

We use the most widely accepted data on income inequality (Deininger and Squire 1996), which are available for a large sample of countries but for particular years only. Our data on foreign direct investment is drawn from UNCTAD (2000) and the World Bank (2000). We calculated the stock of FDI in each year, 1970-1990, by adding the flow of foreign direct investments (in constant dollars) to or subtracting it from the stock of foreign capital in 1980 – the only year for which estimates of FDI stocks are available – taking into account depreciation. We estimate the stock of foreign investment only in the ten years before and after the baseline year (1980) to limit the risk of introducing substantial measurement error into this key variable.<sup>5</sup> By knowing the economic importance of foreign investment for each year, we can ensure that our key indicator of globalization is measured contemporaneously with the year in which income inequality was assessed by national survey.<sup>6</sup> The definitions of our variables and the sources of our data are discussed in the appendix.<sup>7</sup>

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<sup>5</sup> Measurement error is introduced in using flows to estimate accumulated stocks because we do not have precise information regarding depreciation or inflation. We calculated depreciation using the accelerated method assuming that all capital had a half-life of ten years, and we assumed that the GDP deflator is valid for converting capital flows to constant dollars.

<sup>6</sup> Thus, we follow the methods of Ravallion and Chen (1997) and Dollar and Kraay (2000). Other studies (Easterly 1999, Higgins and Williamson 1999, Reuveny and Li 2003) average data on inequality 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. This introduces uncertainty into the temporal sequence because a measure of inequality based on values from early in a decade is regressed on explanatory variables measured at later points in time.

<sup>7</sup> Our data and the programs used to generate the results reported in the tables are posted at [www.bama.ua.edu/~joneal/inequality](http://www.bama.ua.edu/~joneal/inequality).

We first estimate the effect of foreign direct investment on the Gini index, an aggregate measure of income inequality, for all 72 developed and less developed countries in various years, 1970-90. We take care to confirm that these analyses capture the experience of developing countries in particular. To ensure that the marginalization of the poor would be detected, we also perform several tests using the share of income received by the poorest 20% in each society. In most cases, we use ordinary least squares regression analyses of pooled time-series and report robust standard errors that take into account the clustering of our data by country. This produces consistent standard errors even in the presence of serial correlation and heteroskedasticity (Wiggins 1999). We re-estimate key analyses using a fixed-effects model with separate indicators for each country to determine whether our analyses of pooled data capture the actual experience of countries through time.<sup>8</sup>

Our simplest test is presented in the first column of Table 1. We regress the Gini index of national 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 the fears of those who oppose globalization, a large stock of foreign investment is not significantly ( $p < .58$ ) related to the distribution of income. The inverted U-shape of the curve identified by the estimated coefficients of  $\log(\text{GDP per capita})$  and its square is consistent with Kuznets' theory. Income inequality is low among the poorest countries, rises until the average income reaches \$3804 (2000 constant dollars), and then falls with greater development. As we shall see below, however, the Kuznets curve accounts only for variation across countries, not within the time series.<sup>9</sup> Our results confirm that inequality is particularly great in Latin America and Africa (Anand and Kanbur 1993; Tsai 1995; Alderson and Nielsen 1999; Higgins and Williamson 1999; Barro 2000; Dollar and Kraay 2000).

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<sup>8</sup> We do not use the panel-corrected standard error estimator (Beck and Katz 1995) because the number of countries in our pooled data is much greater than the number of observations in the individual time series.

<sup>9</sup> Kohli et al. (1984) noted that Kuznets' argument is not inconsistent with the theory of dependent development: Foreign investment, by promoting growth in the periphery, might increase income inequality in the early stage of industrialization. To insure that the effect of foreign investment was not being obscured, we regressed inequality on the FDI-to-GDP ratio without the two measures of income,  $\log(\text{GDP per capita})$  and its square. The estimated coefficient was far from statistical significance either with ( $p < .63$ ) or without ( $p < .94$ ) the regional indicators.

**Table 1**

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

Variables	(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 robust standard errors.

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

Next, we add two political variables that might influence the national distribution of income. The first is a simple indicator of a socialist economy; the second is a count of the number of years a country had been democratic. Again, there is no evidence that foreign investment by multi-

national corporations increases inequality ( $p < .73$ ). Not surprisingly, however, socialist states have more equal incomes than other countries; the Gini index is 8.5 percentage points lower if a state is socialist. The magnitude of this effect indicates the importance when estimating the effects of FDI on income inequality of controlling for socialist policies.<sup>10</sup> The longevity of democracy does not influence income inequality – a result consistent with most previous research.<sup>11</sup> The log of real income and its square, controlling for the two political influences and the regional indicators, are still jointly significant ( $p < .02$ ), though the log of real income individually just misses ( $p < .07$ ) the conventional level of statistical significance.

In the third column of Table 1, we estimate the effect of foreign investment while controlling for four economic and demographic characteristics that have been emphasized in recent research. The first is a gauge of the relative labor productivity (RLP) of the non-agricultural sector. When RLP is large, there is a clear indication of a dual economy. We also control for the share of GDP represented by the agricultural sector, the percentage of children enrolled in secondary schools, and the percentage of the population under age 15.

These analyses, too, indicate that foreign investment does not affect income inequality ( $p < .70$ ). The distribution of incomes is influenced by the economic importance of agriculture and its relative productivity, as expected, but not by the percentage of the population under 15 or the secondary-school enrollment rate. Thus, we find mixed evidence for Alderson and Nielsen's (1999) internal-developmental model. In the last column of Table 1, we drop the insignificant variables and re-estimate the coefficients. There is little change in the results. This is our best, most parsimonious account of national income inequality.<sup>12</sup> In both columns 3 and 4, there is still support for the Kuznets curve. The

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<sup>10</sup> Reuveny and Li (2003) report that FDI flows are positively correlated with inequality, but this finding may be spurious because they do not control for socialist states. Since the FDI-to-GDP ratio is low in socialist countries, the effects of foreign investment may be conflated with the existence of a market economy. Hungary had the lowest inequality among Reuveny and Li's cases. The fact that the Hungarians preferred to open their economy to FDI – not continue to repel it – is telling. Apparently they preferred higher standards of living with some inequality to greater equality at a lower average income. It is important to note, too, that the standard of living in socialist countries is influenced not only by income but also by privileged access to scarce resources, which is not taken into account in our analyses.

<sup>11</sup> We substituted Jagers and Gurr's (1995) measure of institutional democracy for the count of the years that a country had been democratic, but the results were unchanged.

<sup>12</sup> We tested whether the insignificance of the FDI variable is due to collinearity with any of the control variables, but the estimated coefficient of the FDI-to-GDP ratio

coefficients of real income and its square are jointly significant ( $p < .01$  in column 4), though individually they are not.<sup>13</sup>

### Tests of robustness

In Table 2, we check the robustness of our results. First, we re-estimate the parsimonious model in the last column of Table 1 using a fixed-effects model to capture unique national characteristics that might influence the distribution of incomes.<sup>14</sup> Only variables that change over time can have an effect in fixed-effects analyses, so the socialist variable and the regional indicators drop out. The results in column 1 confirm that foreign investment does not affect inequality. The estimated coefficient of the FDI-to-GDP ratio is not significant at conventional levels ( $p < .10$ , two-tailed test), even though robust standard errors are not available for this estimator. In any event, the substantive impact on inequality is slight. An increase of one standard deviation in the FDI-to-GDP ratio (.12) is associated with a rise of less than one percentage point in inequality ( $4.68 * .12 = .56$ ). This is small compared to the standard deviation of the Gini index (11.15 percentage points).<sup>15</sup>

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remained insignificant when we excluded in turn each of the other independent variables. We also estimated a specification with yearly dummy variables to see whether our results are influenced by the gaps in the inequality data. The significance levels of the FDI-to-GDP ratio and the other variables were unaffected, and the yearly indicators were jointly insignificant.

<sup>13</sup> Kentor (2001) suggests that multinational corporations exert their influence over the long term, so he assesses the effect of foreign investment stocks using a 10-year lag. It is possible that a large foreign presence would have a lasting effect on inequality because the distribution of income is relatively stable for most countries over time; but there is no reason to believe that foreign capital would not also have a proximate influence. To capture the effect of foreign capital over time on inequality, we repeated the analysis in column 4 using, first, five lagged values of the FDI-to-GDP ratio (t-1 through t-6) and, then, ten lagged values (t-1 through t-11) instead of just the contemporaneous measure. None of the individual terms in either analysis was significant, and the lagged terms were jointly insignificant ( $p < .84$  for five lags,  $p < .34$  for ten lags).

<sup>14</sup> Hausman's specification test indicates that a fixed-effects model is superior to an analysis with random effects ( $p < .01$ ). It also is superior on theoretical grounds because we do not have a random sample of cases (Hsiao 1986, 43). There is, however, little difference in the results produced by the two methods. For doubts about the general usefulness of fixed-effects analyses, see King (2001).

<sup>15</sup> This result is not much different from a test using random-effects reported by Alderson and Nielsen (1999). The estimated coefficient of the logarithm of FDI/GDP is 3.42 in their model 10. Thus, a one standard-deviation increase (.43) in their measure of foreign investment raises inequality by 1.47 percentage points, less than 17% of the standard deviation of the Gini index in their sample. This does not suggest "an important role for foreign capital penetration in the generation of inequality" (p. 627).

**Table 2**

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

Variables	(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)	.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 for models 2-4 are robust standard errors.

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

There is no evidence in our fixed-effects analysis that income inequality rises and falls with the average real income, as Kuznets suggested. The estimated coefficients for income and its square are jointly insignificant ( $p < .60$ ).<sup>16</sup> Bourguignon and Morrisson's (1998) measure of relative labor productivity is the only statistically significant variable, and the 68 country indicators account for 90% of the variance in the Gini index – clear indications of the limits of our understanding of the causes of income inequality within countries.

In the second column of Table 2, we show that the effect of foreign investment is the same in developing as in developed countries. In this OLS estimation, we include an interactive term (the logarithm of real income per capita \* the FDI-to-GDP ratio) in the parsimonious specification shown in the last column of Table 1. This allows us to determine whether the effect of foreign investment varies with average real income, as Bornschier and Chase-Dunn (1985) argued. The estimated coefficient of the interactive term is, however, far from statistical significance. Thus, the influence of multinational corporations on national income inequality is not conditional on the host country's level of development. Foreign investment does not adversely affect the distribution of income in either developing or developed countries. This test provides important assurance that the results reported in our other analyses are not biased against finding evidence of an adverse effect of globalization on inequality in developing countries due to over-sampling of wealthy countries.

In the last two columns of Table 2, we substitute two alternative measures of globalization for the FDI-to-GDP ratio in our best specification. In column 3, we use the trade-to-GDP ratio and, in column 4, Sachs and Warner's (1995) measure of economic openness; in both cases, we

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<sup>16</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 and the deviation of a country's income from the inflection point identified in column 1, Table 1. For countries whose income was less than the peak of the Kuznets curve,  $PoorGrowth = Growth * | AverageIncome - InflectionPoint |$ ;  $PoorGrowth = 0$  for countries whose income was greater than the inflection point. The second measure ( $RichGrowth$ ) was constructed in analogous fashion: growth was multiplied by the difference between average income and the inflection point of the Kuznets curve for rich countries;  $RichGrowth$  equalled zero otherwise. We then regressed the Gini index on these two interactive terms and the regional indicators. Neither measure of growth was near statistical significance, and both of the signs were contrary to expectations. There is no evidence, therefore, that economic growth is biased against low-income groups in poor countries.

analyze the pooled time-series using OLS. The trade-to-GDP ratio indicates the economic importance of a nation's exports and imports. It is the most common measure of economic openness; but because it is influenced by fundamental characteristics of a country (*viz.*, its size and geographical location) as well as its economic policies, Sachs and Warner have categorized countries as open or closed based on the level of tariffs, the prevalence of quotas, and other indicators of protectionism. The results reported in the last two columns of Table 2 show that income inequality is unaffected by either of these alternative measures of globalization.<sup>17</sup>

As with the FDI-to-GDP ratio, we assessed whether the effect of trade on inequality was conditional on a country's level of development. 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. We do not report the results in the table, but in both cases the interactive term was insignificant. Thus, contrary to Barro (2000), we find no evidence that economically important trade or a governmental policy of free trade adversely affects income inequality in developing countries. Nor is there support for the prediction of the Stolper-Samuelson theorem that trade increases inequality in developed countries and decreases it in developing ones.

### Testing for marginalization of the poor

Those interested in the effects of globalization are often specifically concerned about the consequences of international capitalism for the well-being of the poorest of the poor. There are theoretical grounds for this humanitarian interest. According to the theory of dependent development, foreign investment may foster growth but development will be distorted. In this view, multinational corporations create enclaves linked to the international economy, where workers earn relatively good wages, while the poor in remote regions are marginalized. Because the Gini index is a summary measure of inequality, higher incomes for a growing middle class could cause the index to decline even though peasants are earning lower wages.<sup>18</sup> For this reason, we next analyze the effect

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<sup>17</sup> In a specification where we included the FDI-to-GDP ratio together with the trade-to-GDP ratio, both variables remained insignificant. They are correlated at  $r = 0.34$ .

<sup>18</sup> Bornschier and Chase-Dunn (1985, p. 123) suggest that only 20 percent of the population in a typical peripheral country are integrated into the world economy, with the rest being marginalized. If only a small proportion of countries' populations benefit from globalization, analyses of the Gini index will capture any adverse effect of economic openness.

**Table 3**

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

Variable	(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 for models 1 and 3 are robust standard errors.  
 \* p < .05 \*\* p < .01 \*\*\* p < .001 (two-tailed tests)

of foreign investment on the share of income of the poorest 20% of society, as Deininger and Squire (1996) recommend.

In column 1 of Table 3, we again use our best, parsimonious specification from Table 1, but substitute for the Gini index the lowest quintile's share of income as the dependent variable. Foreign investment has no effect on the poor's share of national income ( $p < .45$ ). Nor is there evidence of a Kuznets curve. The only significant influences are the indicator of a socialist economy and the relative labor productivity of the non-agricultural sector. The poorest quintile in a socialist country receives 1.13 percentage points more income than in a capitalist country *ceteris paribus* – more than half the standard deviation of the quintile's share of income (2.01 percentage points). An increase of one standard deviation in RLP has only a modest effect, lowering the poor's share of income by 0.29 percentage points.

In the second column of Table 3, we report the results of a fixed-effects test of the effect of foreign investment on the income share of the poorest quintile. The estimated coefficient of the FDI-to-GDP ratio is negative and significant at the .04 level. The effect of a one-standard deviation increase, however, is small: -0.16 percentage points, only 7% of the standard deviation of the lowest quintile's share of income. This again indicates that statistical significances in our fixed-effects analyses are overstated because of the unavailability of robust standard errors for this estimator. The variance explained in this test confirms the limits of our understanding. The overall R-square is .07; within the time series, it is just .04.

In the third column of Table 3, we again ensure that the effects of foreign investment do not differ for the developing and the developed countries. As before, the estimated coefficient of the interactive term (the logarithm of real income per capita \* the FDI-to-GDP ratio) is insignificant. Foreign investment does not further marginalize the poor in developing countries.

### Conclusion

We have assessed the effect of globalization on the distribution of incomes in 72 countries, 1970-90, using the most widely accepted data on income inequality (Deininger and Squire 1996) and recently available information regarding foreign direct investment (UNCTAD 2000; World Bank 2000). In keeping with previous research, we focused on the influence of foreign investment to gauge the consequences of globalization; but we also estimated the effects of two trade-based measures of economic openness: the trade-to-GDP ratio and Sachs and Warner's (1995) indicator

of free-trade policies. We used specifications incorporating the Kuznets (1955) curve, the character of political institutions, and various economic and demographic factors emphasized in recent research. In addition to our analyses of the Gini index, a summary measure of inequality, we assessed the effect of a large multinational presence on the income received by the poorest 20% in each society in order to ensure that we accurately determined the consequences of globalization for the poorest of the poor.

We find no evidence that globalization has adversely affected national income inequality. The ratio of foreign direct investment to gross domestic product is unrelated to the Gini index in all eight of our tests; nor does foreign investment adversely affect inequality in developing countries in particular. The share of income received by the poorest 20% is uncorrelated with the economic importance of foreign investment in our two OLS analyses of the pooled time series. In a fixed-effects test of the lowest quintile's share of income, the effect of FDI is significant statistically because of the lack of robust standard errors for this estimator; but substantively, the effect is small. Nor is either of the trade-based measures of openness associated with greater inequality. Neither the presence of multinational corporations nor international commerce worsens income inequality or increases the marginalization of the poor.

If foreign direct investment increases average incomes (Borensztein, Gregorio, and Lee 1998; de Soysa and O Neal 1999; UNCTAD 1999; Ram and Zhang 2002; Dollar and Kraay 2002; Bhalla 2002) and does not adversely affect the distribution of income even in developing countries, FDI must increase the incomes of the poor in these societies. Dollar and Kraay (2000, 2002) reach the same conclusion regarding the effects of trade. Further research is needed, however, on whether alternative economic strategies are particularly beneficial to the poor. Some may increase the absolute income of the poor by increasing their share of national income while others may benefit the poor by raising the economy's growth rate. Our results indicate that the fears of the anti-globalization movement – that global economic integration comes at the expense of the poor – are not justified; and they reinforce the conclusion of recent research that globalization has reduced global income inequality (Bhalla 2002; Sala-i-Martin 2002; Firebaugh and Goessling 2004).

We investigated the effects of multinational corporations on income inequality in a variety of specifications. In these, we found only limited support for the Kuznets (1955) curve. Income inequality is curvilinearly related to the average real income only in cross-national estimations, not in the individual time-series. Socialist states do have more equal dis-

tributions of income, though this comes at the expense of growth (Barro 1991). The relative labor productivity of agriculture is associated with inequality, but it is hardly surprising that dual economies have high inequality. If there is inequality across economic sectors, there inevitably will be inequality across households. Taken as a group, our analyses make clear the limits of our understanding of the determinants of income inequality: We know more about what does not affect the distribution of incomes than what does.

## **Appendix: Definitions of Variables, Sources of Data, and List of Countries Analyzed**

### *Dependent variable: income inequality*

In tables 1 and 2 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 3 our dependent variable is the poorest quintile's share of national 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., they must be based on nationwide surveys and a comprehensive coverage of income sources). We restrict our sample to these high quality cases.

We corrected Deininger and Squire's Gini and quintile estimates to account for differences in the characteristics of the surveys: inequality is less when measurement is based on expenditures, not income; on income net of taxes, rather than gross income; and on household, not individual, surveys. Using the method of Dollar and Kraay (2000), we adjusted Deininger and Squire's data based on regression analyses that identified the magnitudes of these differences. The summary statistics reported in the table at the end of this appendix are for the corrected data.

### *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 flows from or added them to the stock of foreign direct investment in 1980. We calculated the average value for each year using the stock of FDI at the beginning and the end and divided this by the country's real GDP (Heston et al. 1995). The FDI-to-GDP ratio indicates the importance of foreign investors, particularly multinational corporations, to the economy.

### *Income*

We test for the inverted U-shaped Kuznets curve with the natural logarithm of real GDP per capita and its square based on purchasing power parity in international prices (Heston et al. 1995). The logarithmic transformation is performed to correct the skewed distribution of real GDP per capita.

*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 authoritarian countries. The years of democratic experience were calculated by counting the number of years that the country had been a "coherent democracy" (Jagers and Gurr 1995), i.e., when the democracy-autocracy score was greater than +6. The dummy variable that identifies the socialist states is drawn from Barro (1991). In our sample these are Algeria, Rwanda, Tanzania, Zambia, and China.

*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. RLP is defined as follows:

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

where *RLP* is relative labor productivity, *agrGDP* is agriculture's share of GDP and *agrempl* is its share of employment.<sup>19</sup> 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 agriculture's share of GDP are available from the World Bank's *World Tables* (1989-90, 1994). We also control for the size of the agricultural sector, where income is expected to be more equally distributed. Controlling for sectoral 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.

<sup>19</sup> RLP is similar to the measure of sector dualism used by Alderson and Nielsen (1999), which equals the absolute value of the percent of the labor force in agriculture minus agriculture's share of GDP. Taking the absolute value seems inappropriate, however, because a state whose agricultural sector was more efficient than its industry could have the same score as a state with a more efficient industrial sector.

*Age structure of the population and school enrollment*

We include in some of our analyses a control for the share of total population that is 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 created annual data by interpolating between the five-year estimates.

*Trade*

Trade is an alternative to foreign investment as an indicator of globalization. Our data regarding trade volume are taken from Heston 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.

*Regional indicators*

The regional identifications of the Correlates of War project (Singer 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.

**Table A1**  
Summary Statistics of Variables

	Obs.	Mean	Std.Dev.	Min.	Max.
Gini index of income inequality	383	41.30	11.15	17.67	82.68
Poorest quintile's share of income	342	6.26	2.16	1.60	11.70
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

**Table A2**

## List of Countries Analyzed

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1. Algeria	37. Jordan
2. Australia	38. Korea, Republic of
3. Bahamas	39. Lesotho
4. Bangladesh	40. Malaysia
5. Barbados	41. Mauritania
6. Belgium	42. Mauritius
7. Bolivia	43. Mexico
8. Botswana	44. Morocco
9. Brazil	45. Nepal
10. Cameroon	46. Netherlands
11. Canada	47. New Zealand
12. Chile	48. Nigeria
13. China	49. Norway
14. Colombia	50. Pakistan
15. Costa Rica	51. Panama
16. Cote d'Ivoire	52. Peru
17. Denmark	53. Philippines
18. Dominican Republic	54. Portugal
19. Egypt	55. Rwanda
20. El Salvador	56. Seychelles
21. Fiji	57. Singapore
22. Finland	58. Spain
23. France	59. Sri Lanka
24. Gabon	60. Sweden
25. Germany	61. Taiwan
26. Ghana	62. Tanzania
27. Greece	63. Thailand
28. Guatemala	64. Trinidad
29. Honduras	65. Tunisia
30. India	66. Turkey
31. Indonesia	67. United Kingdom
32. Iran	68. USA
33. Ireland	69. Uganda
34. Italy	70. Venezuela
35. Jamaica	71. Zambia
36. Japan	72. Zimbabwe

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