CAN WE DISCERN THE EFFECT OF GLOBALIZATION ON INCOME DISTRIBUTION?
Evidence from Household Budget Surveys

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ABSTRACT

The effects of globalization on income distribution within rich and poor countries are a matter of controversy. While international trade theory in its most abstract formulation implies that increased trade and foreign investment should make income distribution more equal in poor countries and less equal in rich countries, finding these effects has proved elusive. The paper presents another attempt to discern the effects of globalization by using the data from household budget surveys and looking at the impact of openness and direct foreign investment on relative income shares of low and high deciles. We find some evidence that at very low average income level, it is the rich who benefit from openness. As income level rises, that is around the income level of Colombia, Chile or Czech republic, the situation changes and it is the relative income of the poor and the middle class that rises compared to the rich. It seems that openness makes income distribution worse before making it better—or differently that the effect of openness on country's income distribution depends on country's initial income level.

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1. Introduction

The issues of globalization and income inequality have during the last ten years received a huge attention. Most of it, however, was concentrated on the effects of globalization on within-country developed countries inequality. In other words, the discussion was mostly on how globalization is (or might) affect wage and income inequality in the United States or Western Europe (e.g. Slaughter and Swagel, 1997; Dluhosch, 1998; Schott, 1999; Lejour and Tang, 1999). The second strand of research was concentrated on how globalization might affect the distribution of between-countries' GDPs per capita by leading to the differences in mean per capita growth rates between the countries.

None of these two approaches looked at how globalization affects within-country distribution among the less developed economies. What discussion there was concentrated on the effects of globalization on LDC's growth and technology transfer (Gundlach and Nunnenkamp, 1999) or the theoretical models of income distribution (e.g. Wood, 1998: Benarroch and Gaisford, 1996), not on any empirical assessment. There are exceptions however. Hanson and Harrison (1999), Robertson (2000) study wage inequality in the wake of Mexican trade reforms; Beyer, Rohas and Vergara (1999) look at the similar issue in the context of China; Arbache (1999) studies the effect of market liberalization on inter-sectoral wage dispersion in Brazil. The objective of this paper is to put some "empirical meat" on how globalization affects income distribution in both less developed and advanced countries and to do this using the newly developed data base created in the context of the work on world income distribution and using household survey data. The advantages of the new data base are twofold: (i) it is entirely based on national household surveys around two benchmark years (1988 and 1993), so that income inequality statistics are almost fully mutually comparable; (ii) it gives not one or two income inequality measure (say, Gini coefficient or Theil index) but the actual data on income levels across ten deciles of income distribution. This ability to look at what is happening behind a change in one summary statistic, like the Gini, is crucial if we want to get a better grasp on how globalization affects the entire distribution. We shall try to gauge the effects of globalization from how the overall shape of income distribution changes (income at different decile levels), rather than from a simple calculation of what happens to the Gini coefficient.

The paper has two aims: first, to document changes in the variables thought to reflect globalization over the last 15 years, and second, to try to link them to the changes in income distribution.

The paper is organized as follows. In Section 1, I look at the definition of globalization and what could be the channels through which it might affect income distribution. I also review some recent work on the issues of globalization and inequality. In Section 2, I propose a simply model how globalization effects can affect income distribution. Section 3 presents the descriptive statistics on globalization variables since 1985. Section 4 tries to determine if the globalization variables can be shown to affect the shape of income distribution in both poor and rich countries.

2. What it means to be "globalized"?

It is sometimes useful to begin with the official definition. The official World Bank definition of globalization is "Freedom and ability of individuals and firms to initiate voluntary economic transactions with residents of other countries". Empirically globalization translates into greater mobility of the factors of production (capital and labor) and greater world integration through increased trade and foreign investments—both direct and portfolio. Several recent papers that compare the two globalization waves, the one at the end of the last century up to 1914, and the current one look precisely at these indicators [see Bordo, Eichengreen, and Irwin (1999), Jeffrey Williamson (1996), Craft (2000), Baldwin and Martin (1999)]: how much trade there is now (as the share of world GDP) compared to a century ago, how much direct foreign investment, and portfolio investment, and how easy is it for people to move or to settle in different countries. The studies come with a mixed verdict on the past vs. current globalization. Trade as share of world GDP is about the same now as then, portfolio investment and ability to travel are greater now, but ability to resettle elsewhere is less. Thus, it appears that both labor and capital are in some sense more and less mobile than they were a century ago, and that trade is about as important then as now. However, our objective here is to look at how thus defined and empirically understood globalization can affect income distribution in less developed and advanced countries.

Less developed countries are affected principally in two ways. First, they are able to export more of their own goods (and to import more), and they can be expected to be recipients of direct foreign and portfolio investments from the capital-rich countries. According to the simple version of the Hekschler-Ohlin-Samuelson (HOS) model, less developed countries will tend to export low-skill intensive products (because low-skill labor is their abundant factor and its price will therefore be low). Similarly and for the same reasons foreign investors will also tend to invest in low-skill intensive processes. Moreover as the more advanced countries have an advantage in skill-intensive products and tend to export these, there should be also a reduction in relative wages of highly-skilled workers in less developed countries. When we translate this into what it should imply for income distribution, and approximate the latter by the ratio between the high-skill and low-skill wage, it appears that income inequality *within* the LDCs should go down. Mirroring these developments, income distribution in more developed countries should become more unequal. This is directly derived from price-equalization theorem in its most abstract formulation (see Freeman, 1995 and caveats therein), and is argued, for example in Wood (1995, 1999).

Moreover, as less developed countries continue their process of modernization which implies improvement in educational attainment, the relative supply of high-skill people increases compared to the low-skill people (although not to the extent that it would reverse the comparative advantage of the country). This seems to further reduce the wage differences between the high- and low-skilled workers and to shrink wage (and thus income) distribution.

Relative demand shifts occasioned by globalization would tend to favor less-skilled workers, and so do relative supply shifts brought about by better educational achievement. [2]

What may be the offsetting elements? There are, at least, two. First, rather than looking at globalization through HOS lenses, we may look at it as a Kuznets-type process. Suppose that instead of two types of labor (low- and high-skill) we have three types of labor (low-, medium, and high-skilled). Globalization may produce movement of labor from low wage (agricultural sectors) where wage differentiation is minimal, to medium-skill sectors (in urban areas) where wage differences are larger. Then, even if the ratio between the top and bottom shrinks (as the ratio between high-skill and low-skill wage becomes smaller), overall wage and income inequality might increase simply because of the greater wage differentiation in the middle. In conclusion, the ratio between the average wages for different types of labor is not sufficient to describe what happens to the distribution. We need to look at the pattern of change across the entire distribution, and at the differences in how wages of particular skills are distributed.

Second, although wages constitute, even in developing nations, the largest chunk of total income, there are two other sources that affect income inequality significantly. They are self-employment income (including home-consumption), and capital (property) income. The share of self-employment income would tend to go down as people move from basically subsistence agriculture, to become wage-workers. The importance of capital income will depend on what happens to the real interest rate, whose level is, in turn, dictated by what happens in rich countries. (This is particularly so in an era of globalization.) Since property income is very strongly concentrated among the top income classes, that element too might provide a very strong countervailing force to decreasing inequality—much greater in effect than a simple share of capital income in total would imply.

3. Modeling the channels of influence

In a very simple way, absolute income level of *i*-th decile in *j*-th country at time *t* can be written as a function of an inequality parameter specific to the country (I_{jt}) and the mean income of the country (m_{jt}), both subscripted for time.

$$y_{ijt} = f(I_{jt}, m_{jt}) \qquad (1)$$

The relative income of the *i*-th decile (normalized by the mean) is then

$$\frac{yij}{mjt} = g(Ijt) \qquad (2)$$

[2] A different approach is proposed by political scientists. Rogowski (1987) argues that economic oppeness favors industrial concentration which in turn leads to more centralized collective bargaining. The latter is associated with low wage, and most likely, higher overall income inequality. According to this view, openness would have a positive effect on inequality regardless of level of income although the link between industrial concertation and collective bargaining makes more sense in the cintext of advanced countries.

The change in *i*-th decile relative income between the two time period becomes

$$\Delta\left(\frac{y_{ij}}{m_j}\right) = h(\Delta I_j) \qquad (3)$$

We now allow for two possibilities which will represent the two ways in which we test our hypothesis of the effect of the globalization variables on income distribution. First, we assume that *level* of our inequality index depends on *levels* of the variables listed below, and second, that the *change* in the inequality index between two time periods depends on the *change* in the same variables. The variables are:

(1) two "standard" globalization variables, namely openness (OPENj) measured as the sum of exports and imports in country's GDP, and direct foreign investment as share of GDP (DFIj),

(2) financial depth (FD_j) the ratio of M2-to-GDP, introduced on the assumption that greater financial depth should reduce the importance of financial constraint to borrow for education, and thus should help those who are talented but lack resources, and reduce inequality (see, for example, Li, Squire and Zhou, 1998), and

(3) an indicator of democracy (DEM_j), on the assumption that democratization, through the median voter hypothesis, should lead to a reduction in inequality (see Gradstein, Milanovic, Ying, 1999).

Financial depth and democracy are not viewed as linked with globalization even if one might plausibly entertain such a view too. For example, one can regard increasing financial depth, that is increasing monetization of the economy to proceed directly from better integration of a country into the international economy, and democratization occur too in response to greater international exchange and simply due to global political trends. However, we view these two variables as controls for the "non-globalization related" part of the influence on income distribution, and orthogonal to the globalization-proper variables. We introduce them primarily to avoid misspecification of the model. We then rewrite (2) and (3) in the reduced form as

$$\frac{yij}{mjt} = \Psi(OPEN_j, DFI_j, FD_j, DEM_j) \qquad (2a)$$

$$\Delta\left(\frac{y_{ij}}{m_j}\right) = \psi(\Delta OPEN_j, \Delta DFI_j, \Delta FD_j, \Delta DEM_j) \qquad (3a)$$

where Δs of course represent changes between the two time periods, y_{ij} = income of *i*-th decile (deciles go from the poorest, 1, to the richest, 10), *j*-th country; ΔOPEN = change in openness between 1985-91 and 1992-97; ΔDFI = change in direct foreign investment as share of GDP over the same two periods, ΔFD = change in financial depth (M2/GDP), and ΔDEM = change in democracy over the same two periods. Of course, ten regressions such as (2a) and (3a) are estimated: one for each decile.

However, we need also to take into account the fact that the globalization variables will not affect the share of a given decile the same regardless of the country and its level of development. Consider the following fact. Increased openness and direct foreign investments will, as the theory tell us, tend to benefit low-skilled workers in poor countries since it would be these low-skill intensive industries which would be both attractive to foreign investors and likely to take advantage of export opportunities. Thus, we would expect that the sign of OPEN and DFI variables will be positive among the bottom deciles in poor countries. But for a rich country, the situation is exactly the reverse. Openness will mean that it is the low-skilled workers in rich countries that would be exposed to increased foreign competition (see Wood, 1995); such low-skill intensive products are unlikely to be exported by the rich countries, and we would expect that sign of OPEN and DFI variables to be negative for low income deciles in rich countries. The coefficients of two globalization variables will therefore vary in function of income level of the country. Ideally, of course, the coefficients should vary in function of the skill composition of each income decile and country's income level. However, since we do not have information on who exactly *is* in each decile and what is the skill composition of people per decile, we shall have to use country's income level as a sole determinant.

Thus, we can write for each decile:

$$\frac{yi}{mj} = \beta_0 + \beta_1 OPEN_j + \beta_2(OPEN * mj) + \beta_3 DFI_j + \beta_4(DFI * mj) + \beta_5 FD_j + \beta_6 DEMj \qquad (2b)$$

$$\Delta\left(\frac{y_{ij}}{m_j}\right) = \beta_1 \Delta OPEN_j + \beta_2(\Delta OPEN * m_j) + \beta_3 \Delta DFI_j + \beta_4(\Delta DFI_j * m_j) + \beta_5 \Delta FDj + \beta_4 \Delta DEMj$$

(3b)

As for the signs of β_3 and β_4 associated with respectively financial depth and democracy, we expect them to be positive among the low deciles, and negative among the higher deciles—on the theory that lack of deep financial markets (inability to borrow against one's future income) is bad for the poor and for equality (see Li, Squire, Zhao, 1997; Becketty,), and that democratization should likewise help the poor by leading to greater redistribution (see Gradstein, Milanovic and Ying, 2000).

As we indicated, there are 10 cross sectional regressions such as (2b) and (3b); one for each income decile run across all countries. In other words, we try to see how a set of macroeconomic changes (on the RHS) has affected the relative (to the mean) income level of each income decile.

4. Descriptive statistics

Before trying to link globalization and other macro variables to changes in income distribution, we need to define variables more precisely. For the distribution, we use the data on $PPP incomes of each decile for almost 90 countries around 1988 (more exactly between 1985

and 1991) and around 1993 (more exactly between 1992 and 1997). All RHS variables are calculated as the averages over a period. There are two reasons for this rather than simply using a single value for 1988 or 1993. First, the distribution data are only "benchmarked" in 1988 and 1993. The actual surveys which we use to derive the decile data might have been conducted in the years around 1988 (say, 1986 or 1989). The situation is the same for the year 1993. (For the list of surveys, source of data etc. see Milanovic, 2002, Appendix 1).

Second, even if all surveys were conducted in the same year, there would be some advantage in relating changes in mean incomes to, say, several years average share of exports and imports in GDP. This in order to avoid having the results being swamped by very short run changes. Al mentioned before, globalization is reflected in two variables: openness—share of combined exports and imports in GDP—and the share of direct foreign investments in GDP of the recipient country. Openness that is associated with income distribution around 1988 is taken to be the average of exports and imports over GDP during the period 1985-91 (*openpre*). Openness that is associated with income distribution in 1993 is defined as the average over 1992-97 period (*openpost*). The change in openness is then obtained as *openpost-openpre*. Identical calculations are done for direct foreign investment, M2/GDP, and democracy variables, except that in a few cases (when the data were available), the latter period extended up to 1998.

Table 1 shows mean-normalized average incomes of each decile in 1988 and 1993. For example, we see that on average (calculated across 88 countries and without any weighting) in 1988, the bottom decile's income was 30.7 percent of the mean. By 1993, the bottom decile's income was only 24.8 percent of the mean. Relative incomes of the bottom seven deciles went down—with the negative change the largest among the poor deciles—while the relative income of the top three deciles went up, again with the greatest positive change among the top. Thus, for example, on average people in the top decile in 1988 were having incomes that were 2.735 times greater than the national mean. In 1993, these incomes were almost 3 times greater than the mean. On a cross-country basis, we observe increased inequality: incomes of the low deciles have tended to be fall behind the mean income growth, incomes of the top to forge ahead of the mean.

Table 1. Mean-normalized average incomes of each decile
(across countries, not weighted for population)

	1988	1993	Change
First	0.307	0.248	-0.059
Second	0.443	0.399	-0.044
Third	0.541	0.503	-0.039
Fourth	0.637	0.600	-0.037
Fifth	0.738	0.707	-0.031
Sixth	0.857	0.836	-0.021
Seventh	1.003	0.988	-0.014
Eighth	1.201	1.208	0.008
Ninth	1.538	1.577	0.039
Tenth	2.735	2.934	0.198
Total	1	1	0

Note: based on 88 same countries in 1998 and 1993. Deciles formed based on per capita income or expenditures (obtained from household surveys).

Table 2 shows the increase in the combined share of exports and imports in GDP over the period under study. There is a sustained increased in the (unweighted) share from around 60 percent in the mid-1980's to almost 80 percent in the late 1990's.

Table 2. Share exports and imports in GDP
(unweighted; cross country)

Year	Number of countries	Average share of openness (in percent)	Minimum (in %)	Maximum (in %)
1985	69	62.3	14 (India)	209 (Hong Kong)
1986	70	59.9	14	214
1987	71	60.7	14	235
1988	71	62.2	15	257
1989	71	64.9	14	255
1990	71	65.8	14	260
1991	72	65.5	14	271
1992	79	64.1	15	281
1993	84	66.8	16	274
1994	86	70.6	17	278
1995	87	74.8	16	303
1996	86	74.4	16 (Brazil)	286 (Hong Kong)
1997	85	77.0	18 (Brazil)	264 (Cyprus)
1998	63	79.2	18 (Brazil)	250 (Hong Kong)

Source: *World Development Indicators*; World Bank. SIMA Database, World Bank.

The increase in openness was registered in all the regions except the most developed (WENAO) where it went down by 2.7 Gini points (Table 3). It was by far the most significant for the Asian economies whose openness increased by more than 15 GDP points on average. For 49 countries where openness increased, it did so by on average of 12.4 GDP points. The most significant increases were registered by Malaysia (from 129 to 177 percent of GDP), Hong Kong (from 243 to 281 percent), Jamaica (from 108 to 139 percent), and Paraguay (from 64 to 98 percent). For 19 countries where openness went down, it did so by an average of 5.5 GDP points. The most significant decreases were for Luxembourg (from 155 to 100 percent of GDP), Switzerland (from 83 to 75 percent), and Peru (from 34 to 26 percent). Openness for several of the largest (by GDP) countries increased. For example, for the US it increased from 19 to 24 percent of GDP, for China, from 28 to 40, for India, from 15 to 23, from Brazil, from 16 to 17 percent. But, on the other hand, for Japan, openness went down from 20 to 18 percent of GDP.

Table 3. Openness (exports plus imports) as percentage of GDP
(unweighted regional averages)

	First period (1985-91)	Second period (1992-97)	Change in openness	No. of countries
Africa	59.7	67.3	+7.6	12
Asia	61.5	77.0	+15.5	16
Latin America	54.4	64.5	+10.1	17
Transition economies	68.8	71.4	+2.6	3 in the first, 11 in the second period
WENAO	72.0	69.3	-2.7	21
World	63.4	69.8	+6.4	69; 77

Even more dramatic were increases in foreign direct investments as percentage of GDPs of the recipient countries (Table 4). The unweighted importance of foreign direct investments increased from about 1.1 percent of GDP in 1985 to 5.6 percent in 1998. If we compare the first (1985-91) and the second (1992-97) period, for 52 countries, the average share of DFI inflows in GDP increased, while for only ten countries it became less important. In seven countries (Lesotho, Luxembourg, Panama, China, Bolivia, Hong Kong, and Peru) the share of direct foreign investment in GDP in the second period exceeded by more than 5 GDP percentage points the share in the first period. The most important increases were registered in Lesotho (from 2.7 to 24 percent of GDP), and Luxembourg (from 66 to 81 percent of GDP). For China, the importance of DFI went up, over the same period, from an average of less than 1 percent of GDP to more than 5 percent of GDP. In the US, DFIs increased from 0.9 to 1 percent of GDP. India, which started with almost no direct foreign investments, reached some ½ one percent of GDP in the second period.

Table 4. Foreign direct investment as percentage of recipient country's GDP (unweighted average)

Year	Number of countries	Percentage of GDP	Maximum a/
1985	66	1.09	5.7 (New Zealand) 3.4 (Egypt)
1986			
1987			
1988	67	1.90	4.7 (Lesotho) 4.5 (Hong Kong)
1989	67	2.63	7.9 (Nigeria) 4.7 (Chile)
1990	69	2.42	6.2 (Zambia) 5.5 (Malaysia)
1991	71	2.35	8.5 (Malaysia) 4.7 (Belgium)
1992	82	2.27	8.8 (Malaysia) 5.2 (New Zealand)
1993	85	2.55	7.8 (Malaysia) 6.4 (China)
1994	86	3.08	36.0 (Lesotho) 7.1 (China)
1995	87	3.16	32.3 (Lesotho) 10.0 (Hungary)
1996	87	3.48	33.2 (Lesotho) 7.4 (Latvia)
1997	87	4.33	28.3 (Lesotho) 14.5 (Panama)
1998	86	5.63	33.1 (Lesotho) 13.2 (Panama)

a/ Luxembourg, which in all years has the highest share of direct foreign investment in GDP (over 70 percent) is not shown.

Source: *UNCTAD Handbook of International Trade and Development Statistics*, 1996, 1997, 2000.

Alike trade, the flow of direct foreign investment has increased in all regions of the world with the most significant *unweighted* increases occurring in Africa and in transition economies, where in the first period, foreign investment was practically nil (Table 5).

Table 5. Direct foreign investment as percentage of GDP
(unweighted regional averages)

	First period (1985-91)	Second period (1992-98)	Change in DFI	No. of countries
Africa	1.3	3.9	+2.6	11
Asia	1.0	2.2	+1.2	14; 16
Latin America	0.9	3.0	+2.1	16
Transition economies	0.1	2.3	+2.1	1; 15
WENAO	4.4	5.7	+1.3	22
World	2.1	3.6	+1.5	64; 80

We are less interested in the other two control variables, financial depth (M2/GDP) and democracy. The former is measured in a straight-forward fashion, as the ratio of M2 to GDP (see Table 7). The latter is measured by the Executive and Legislative Index of Electoral Competitiveness, a variable from the Database of Political Institutions (DBI) developed by Beck, Clarke, Groff, Keefer, and Walsh (2000). Indexes' values range from 1—least democratic—to 7 –most democratic (see Table 8).

Table 7. M2 as percentage of GDP
(unweighted regional averages)

	First period (1985-91)	Second period (1992-97)	Change in M2/GDP	No. of countries
Africa	46	39	-7	11;10
Asia	58	78	+20	13;14
Latin America	31	35	+4	17
Transition economies	44	40	-4	2; 4
WENAO	61	65	+4	15
World	48	53	+5	58;60

Source: *World Development Indicators*, World Bank.

Democracy as proxied by an index of competitiveness in legislative elections (LIEC) and in the election of chief executive (EIEC) shows an increase in all the regions (except in WENAO where it was already at the maximum). The most important increases were registered, of course, in the transition countries. It is interesting that only four countries show a deterioration in democracy between the two periods as estimated by LIEC (Algeria, Indonesia, Mexico and Thailand), and only three countries as estimated by EIEC (Jordan, Thailand and Uganda).

Table 8. Democracy proxied by the Legislative and Executive Index of Electoral Competitiveness (LIEC and EIEC)
(unweighted regional averages)

	First period (1985-91)		Second period (1992-97)		Change		Number of countries
	LIEC	EIEC	LIEC	EIEC	LIEC	EIEC	
Africa	4.1	3.5	4.9	4.6	+0.8	+0.9	12;11
Asia	5.4	5.0	6.3	5.5	+0.9	+0.5	12
Latin America	6.7	6.6	6.9	6.9	+0.2	0	17
Transition economies	3.4	3.2	6.4	5.9	+3.0	+2.7	17; 15
WENAO	7.0	7.0	7.0	7.0	0	0	22
World	5.5	5.3	6.5	6.2	+1.0	+0.9	80;77

Source: Legislative Index of Electoral Competitiveness and Executive Index of Electoral Competitiveness from *Database of Political Institutions* (DBI). Both indexes range from 1 (least competitive) to 7 (most competitive). For explanation how the indexes are derived, see Beck et al. (2000).

5. Estimation of the regressions

Next we estimate the two types (level and change) of regressions:

$$\frac{yij}{mj} = \beta_0 + \beta_1 OPEN_j + \beta_2(OPEN * mj) + \beta_3 DFI_j + \beta_4(DFI * mj) + \beta_5 FD_j + \beta_6 DEMj + ei \quad (2b)$$

$$\Delta\left(\frac{y_{ij}}{m_j}\right) = \beta_1 \Delta OPEN_j + \beta_2(\Delta OPEN * m_j) + \beta_3 \Delta DFI_j + \beta_4(\Delta DFI_j * m_j) + \beta_5 \Delta FDj + \beta_4 \Delta DEMj + ui \quad (3b)$$

where all the variables and coefficients are as already explained. There are 10 such cross sectional regressions under each specification: one for each income decile run across all countries. Error terms are supposed to obey all the desirable properties as openness, direct foreign investments, financial depth and democracy may be assumed exogenous to income distribution (that is, to decile shares). [3] The results are shown in Tables 1-4.

The first (levels) regression is a pooled cross-section equation run across 88 countries for which we have decile data in 1988 and 1993. As can be seen in Table 1, for bottom seven deciles, openness is negatively related with their income share. However, that negative effect is lessened for richer countries as the interaction term between openness and mean income is positive. Openness would therefore seem to have a particularly negative impact on the poor and the middle-income groups in *poor* countries—which is *directly opposite* to what we would have expected based on theory. It is only when income level leaches $5,000-$6,000 in purchasing

[3] We allow for possibility that income level may influence relative income shares in equation (2b) and introduce mean household survey income and mean squared income. However, neither variables is significant.

power terms, that is around the income level of the Czech republic, Colombia or Chile, that for the poor (the bottom three deciles) openness becomes a "good thing"—that is, raises their share in total income.

Note also that the turning point (positive impact of openness) takes place earlier for the middle and higher income deciles. For example, the share of the seventh decile is favorably affected when overall mean income reaches about $3,900 (slightly above the level of Panama). For the top two deciles, openness exerts the opposite effect. It particularly raises the income of the rich in poor countries, and its positive effect on the rich is reduced as mean income increases. For mean income levels around $5,000-$6,000, the impact of openness on income share of the rich becomes negative.

The results of the level regression thus suggest an almost Kuznets-like effect of openness on income distribution. When a country is relatively poor, increased openness raises the income share of the top, and reduces the income share of the poor groups as well as of the middle class. (We are throughout talking of "shares", not absolute incomes.) However, at some medium-level of income ($5-6,000 per capita based on Household survey data), income share of the poor and the middle class begin to be positively affected by openness while the income share of the rich begins to decline. Finally, for the rich countries, openness is associated with increasing share of the bottom and middle deciles, and decreasing share of the top deciles. Openness thus helps income distribution chart an inverted U shape as income level increases. At low income levels, openness is bad for equality; at medium and high income level it promotes equality.

This suggests that only the middle-income countries behave as the rigorous version of theory would imply. But poor countries whose equality should be helped by openness, and the rich countries where openness should increase income differentials, behave in the exactly reverse fashion than we would expect. However, these results are consistent with those posited by Wood (1994). In his model, poor countries that open up may experience increased inequality because there are three types of labor, and the openness helps those with basic and high education, but reduces the income share of those with no education (they fall further behind). It is only when basic education becomes the norm—and even the poor have it—that openness exert an income-equalizing effect. This is what we might be picking up in resuts which show at some middling level of income ($5-6,000), the share of the lower and middle income classes begins to rise. As Wood (1994) writes, a strategy based on exports of manufactures that require at least basic education would be equitable in Korea but inequitable in Burkina Faso or Pakistan (quoted from Kanbur, 1998).

Direct foreign investments (as a share of country's GDP), or financial depth are not significant in any regression. Democracy, proxied by the way that the country's chief executive is elected, is shown to be negatively associated with income share of the poor and the middle class, and positively associated with income share of the top decile. A one point increase in thus measured democracy (from, say the level of Ghana to that of Indonesia) lowers the income share of the poorest decile by 0.2 percent (of total income) and raises the share of the top decile by 1.3 percent of total income. However, when we proxy democracy by the level of democracy in election of legislature (national Parliament) the effect disappears—there is neither a positive nor negative effect. The variable is not statistically significant from zero.

Regressions in Table 2 are the same as in Table 1 except that we now add regional dummies—thus assuming that there are specific regional intercept effects. While openness variable is not affected, interaction between openness and mean income is, as some of its effect seems to be taken over by the regional variables. In Asia, Eastern Europe and WENAO countries, regional dummies offset to a large extent the negative effect of openness on low income deciles. In Eastern Europe and WENAO openness appears to help the poor deciles; in Asia, it does not affect them, while now only in Africa and Latin America openness hurts the poor. We are not surprised by the results for WENAO countries because they were already implied in our earlier finding (from Table 1) that at a relatively high income level, openness increases income shares of the poor and the middle class. However, in Africa and Latin America, openness increases inequality at low income levels. The other variables show no change except that the importance of democracy declines.

The results in Tables 1 and 2 were obtained by running the decile regressions independently, one by one. This is, however, a simplification because income shares are determined simultaneously. By running the decile regressions as a simultaneous system (leaving aside one decile in order to avoid orthogonality), we also avoid the inconsistency of having a possibility of an RHS variable affecting all *shares* negatively or positively. This is done in Table 3. [4] The results show that openness is still negatively associated with income of low and middle income deciles, and positively with relative income of the rich. The turning point (positive effect of openness) for the bottom three deciles occurs at around $PPP 5-6,000, for the middle deciles around $PPP 4-5,000. At about the same income level, the rich (top two deciles) who initially benefited from openness begin to lose (in relative terms). DFI and its interaction with mean income still remain insignificant, while democracy is strongly pro-rich.

When we move (in Table 4) to look at the effect of the same variables on *change* in decile shares between 1988 and 1993, the results change. No variable is now shown to be statistically significant. The impact of our variables on changes in shares is apparently much more difficult to detect—possibly because the time period under consideration was short.

[4] We run a system of simultaneous equations (seemingly unrelated regressions or SURE) where all the right-hand variables are assumed to be exogenous to decile shares. There is also a constraint such that the coefficient on the omitted decile share must equal the (negative) sum of coefficients on all other decile shares. The reason is that if a change in a RHS variable increases the share of (say) bottom deciles, it must by the same amount reduce the share of upper deeciles.

Table 1. Explaining mean-normalized decile incomes (1988,1993)
(regressions run independently; dependent variable: decile income/mean income)

	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Openness	-0.108	-0.185	-0.203	-0.194	-0.177	-0.155	-0.116	-0.027	0.127	1.037
	(-0.009)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.427)	(0.030)	(0.000)
Interaction of openness and mean income level	0.00002	0.00003	0.00004	0.00004	0.00003	0.00003	0.00003	0.00001	-0.00002	-0.00021
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.003)	(0.000)
DFI	-0.452	-0.298	-0.283	-0.451	-0.480	-0.497	-0.420	-0.102	0.296	2.687
	(0.374)	(0.585)	(0.593)	(0.395)	(0.332)	(0.282)	(0.338)	(0.812)	(0.682)	(0.396)
Interaction of DFI and income level	0.00003	0.000004	0.000001	0.00001	0.00002	0.00002	0.00001	-0.000004	-0.00001	-0.00007
	(0.452)	(0.921)	(0.975)	(0.716)	(0.641)	(0.625)	(0.686)	(0.880)	(0.826)	(0.739)
Financial depth	-0.00008	-0.00148	-0.00234	-0.00258	-0.00227	-0.00086	-0.00055	0.00048	0.00351	0.00616
	(0.983)	(0.702)	(0.533)	(0.492)	(0.518)	(0.792)	(0.859)	(0.874)	(0.493)	(0.783)
Democracy (EIEC)	-0.0218	-0.0201	-0.0188	-0.0178	-0.0165	-0.0146	-0.0131	-0.0106	0.0033	0.1301
	(0.001)	(0.004)	(0.006)	(0.009)	(0.009)	(0.013)	(0.019)	(0.052)	(0.718)	(0.001)
Transition Dummy	0.114	0.167	0.185	0.183	0.172	0.149	0.112	0.052	-0.130	-1.004
	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.101)	(0.017)	(0.000)
Constant	0.371	0.519	0.621	0.716	0.811	0.921	1.061	1.250	1.550	2.180
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R2 Adjusted	0.21	0.345	0.3966	0.3911	0.3977	0.3871	0.2925	0.0539	0.0973	0.3676
F statistics	5.25	9.43	11.51	11.28	11.57	11.1	7.61	1.91	2.72	10.3
No of obs.	113	113	113	113	113	113	113	113	113	113

Note: Statistically significant (at 1 and 5 percent levels) coefficients are shaded.

Table 2. Explaining mean-normalized decile incomes (1988,1993)
(regressions run independently; with regional dummy variables; dependent variable: decile income/mean income)

	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Openness	-0.060	-0.123	-0.132	-0.121	-0.098	-0.069	-0.032	0.031	0.100	0.503
	(0.115)	(0.003)	(0.001)	(0.003)	(0.009)	(0.042)	(0.322)	(0.369)	(0.114)	(0.028)
Interaction of openness and mean income level	0.00001	0.00002	0.00002	0.00002	0.00001	0.00001	0.00000	0.00000	-0.00002	-0.00006
	(0.319)	(0.017)	(0.011)	(0.024)	(0.059)	(0.216)	(0.733)	(0.481)	(0.155)	(0.137)
Asia dummy	0.130	0.129	0.121	0.109	0.090	0.065	0.028	-0.022	-0.119	-0.531
	(0.000)	(0.000)	(0.001)	(0.002)	(0.005)	(0.024)	(0.317)	(0.463)	(0.029)	(0.007)
Latin America dummy	-0.039	-0.039	-0.034	-0.035	-0.038	-0.041	-0.051	-0.060	-0.040	0.377
	(0.252)	(0.292)	(0.339)	(0.334)	(0.255)	(0.169)	(0.083)	(0.054)	(0.478)	(0.066)
Eastern Europe FSU dummy	0.136	0.191	0.210	0.206	0.190	0.159	0.107	0.027	-0.184	-1.043
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.454)	(0.006)	(0.000)
WENAO dummy	0.085	0.112	0.128	0.129	0.135	0.143	0.125	0.064	-0.097	-0.824
	(0.049)	(0.018)	(0.006)	(0.006)	(0.002)	(0.000)	(0.001)	(0.109)	(0.179)	(0.002)
DFI	-0.386	-0.264	-0.275	-0.467	-0.537	-0.608	-0.586	-0.291	0.158	3.256
	(0.371)	(0.572)	(0.545)	(0.313)	(0.206)	(0.114)	(0.115)	(0.464)	(0.826)	(0.211)
Interaction of DFI and mean income	0.00003	0.00001	0.00001	0.00003	0.00003	0.00004	0.00004	0.00002	-0.00001	-0.0002
	(0.298)	(0.696)	(0.688)	(0.409)	(0.271)	(0.173)	(0.167)	(0.556)	(0.883)	(0.277)
Financial depth	0.0003	-0.0005	-0.0008	-0.0009	-0.0001	0.0019	0.0024	0.0028	0.0032	-0.008
	(0.930)	(0.892)	(0.797)	(0.797)	(0.975)	(0.490)	(0.368)	(0.336)	(0.536)	(0.657)
Democracy (EIEC)	-0.015	-0.015	-0.015	-0.014	-0.013	-0.012	-0.010	-0.006	0.007	0.094
	(0.032)	(0.058)	(0.049)	(0.063)	(0.056)	(0.052)	(0.085)	(0.321)	(0.547)	(0.028)
Constant	0.298	0.444	0.550	0.648	0.749	0.865	1.019	1.230	1.592	2.605

	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000(	(0.000)	(0.000)	(0.000)	(0.000)
No of obs	113	113	113	113	113	113	113	113	113	113
F Stat	9.88	13.45	15.57	14.55	15.71	16.77	12.45	3.91	2.58	16.56
R^2 adjusted	0.4422	0.5265	0.5654	0.5475	0.5677	0.5847	0.5055	0.2063	0.1237	0.5815

Table 3. Explaining mean-normalized decile incomes (1988,1993)
(regressions estimated simultaneously; dependent variable: decile income/mean income)

	First	Second	Third	Fourth	Sixth	Seventh	Eighth	Ninth	Tenth
Openness	-0.099 (.015)	-0.172 (.000)	-0.189 (.000)	-0.180 (.000)	-0.144 (.000)	-0.107 (.003)	-0.023 (.486)	0.117 (.040)	0.960 (.000)
Interaction of openness and mean income	0.00002 (.001)	0.00003 (.000)	0.00003 (.000)	0.00003 (.000)	0.00003 (.000)	0.00002 (.000)	0.00001 (.010)	-0.00002 (.007)	-0.0002 (.000)
DFI	-0.515 (.311)	-0.390 (.489)	-0.385 (.492)	-0.553 (.323)	-0.579 (.228)	-0.482 (.277)	-0.131 (.754)	0.368 (.606)	3.242 (.325)
Interaction of DFI and mean income	0.00003 (.364)	0.00001 (.762)	0.00001 (.795)	0.00002 (.566)	0.00002 (.493)	0.00002 (.565)	-0.000002 (.947)	-0.00002 (.726)	-0.0001 (.593)
Financial depth	0.003 (.422)	0.003 (.477)	0.002 (.544)	0.002 (.591)	0.003 (.378)	0.002 (.454)	0.002 (.527)	0.0002 (.963)	-0.019 (.393)
Democracy (EIEC)	-0.022 (.000)	-0.021 (.003)	-0.020 (.005)	-0.019 (.008)	-0.015 (.011)	-0.014 (.014)	-0.011 (.039)	0.004 (.658)	0.135 (.001)
Constant	0.376 (.000)	0.527 (.000)	0.630 (.000)	0.725 (.000)	0.928 (.000)	1.067 (.000)	1.253 (.000)	1.544 (.000)	2.131 (.000)
No of obs	113	113	113	113	113	113	113	113	113
Pseudo "R-sq"	0.195	0.285	0.314	0.309	0.321	0.261	0.090	0.106	0.303

Table 4. Explaining decile incomes *change* between 1988 and 1993
(regressions run simultaneously; dependent variable ; dependent variable: Δ(decile income/mean income))

	First	Second	Third	Fourth	Sixth	Seventh	Eighth	Ninth	Tenth
Δopenness	-0.077 (.406)	-0.087 (.384)	-0.050 (.617)	-0.042 (.654)	0.011 (.901)	-0.001 (.991)	-0.200 (.052)	-0.336 (.074)	0.787 (.217)
Interaction of change in openness and mean income	0.00002 (.524)	0.00002 (.639)	0.000008 (.806)	0.000002 (.958)	-0.00001 (.727)	-0.000007 (.791)	-0.00002 (.492)	-0.00005 (.365)	0.00005 (.789)
ΔDFI	-0.219 (.654)	-0.189 (.719)	-0.247 (.637)	-0.351 (.470)	-0.324 (.484)	-0.001 (.998)	0.375 (.486)	0.735 (.455)	0.465 (.889)
Interaction of change in DFI and mean income	0.0003 (.381)	0.0003 (.415)	0.0003 (.376)	0.0003 (.351)	0.0003 (.294)	0.0001 (.649)	-0.0001 (.840)	-0.0005 (.472)	-0.0013 (.541)
Δ Financial depth	-0.028 (.661)	-0.012 (.863)	-0.048 (.494)	-0.084 (.195)	-0.149 (.015)	-0.167 (.003)	-0.144 (.045)	-0.098 (.456)	0.872 (.049)
Δ democracy (EIEC)	-0.0005 (.944)	0.0007 (.930)	-0.0010 (.891)	-0.0018 (.795)	-0.0009 (.894)	-0.0055 (.366)	0.0033 (.672)	0.0092 (.521)	0.0006 (.990)
No of obs	45	45	45	45	45	45	45	45	45
"R-sq"	0.068	0.062	0.057	0.083	0.162	0.203	0.379	0.316	0.230

6. Conclusions

The effects of globalization on income distribution within rich and poor countries are a matter of controversy. While international trade theory in its most abstract formulation implies that increased trade and foreign investment should make income distribution more equal in poor countries and less equal in rich countries, finding these effects has proved elusive.

Here we have tried to discern the effects of globalization by using data from household surveys and by looking at the impact of openness (combined share of exports and imports in country's GDP) and direct foreign investment as a share of country's GDP, on relative income shares of low and high deciles. We find some evidence that at a very low income level, it is the rich who benefit from openness. As income level rises, that is for countries like Colombia, Chile or Czech republic, the situation changes and the relative income of the poor and the middle class rises compared to the rich (top deciles). It seems that openness makes income distribution worse before making it better—or differently that the effect of openness on country's income distribution depends on country's initial income level.

These results run counter to simple factor-price equalization theory with two types of labor. They are however consistent with a view propounded by Wood (1994) that, with three types of labor (no education, basic, and highly skilled), openness in very poor countries might increase inequality by helping those with basic education, and leaving even further behind those with no education. Only when at least basic education becomes the norm, can even the poor deciles (consisting of people with basic education) share benefits of incresed labor demand; then inequality falls.

When we introduce regional dummy variables, they tend to override the effect of income level. Thus, openness seems to be associated with improved equality in rich countries and transition economies, not to have much of an effect in Asia, and to be associated with worsening inequality in Latin America and Africa.

We do not find any significant effect of direct foreign investment on income distribution. Finally, when these same variables are used not in the level form, but as first difference (change) between 1988 and 1993, to explain changes in income shares between the two same dates, the results are very weak: we fail to find any significant impact.

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