Openness and Inequality in Developing Countries:  
A Review of Theory and Recent Evidence

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Summary. — Increased openness affects income inequalities within developing countries by affecting factor price ratios, asset inequalities, spatial inequalities, gender inequalities, and the amount of income redistribution. Most time-series studies find that greater openness has increased the relative demand for skilled labor, but most cross-country studies find that greater openness has had little impact on overall income inequality. One possible explanation is that countries selected for time-series analysis are not representative of all developing countries. Another is that the effects of openness on income inequality via the relative demand for skilled labor have been offset by its effects via other channels.

Key words — trade, technology transfer, FDI, income distribution

1. INTRODUCTION

This paper reviews existing theory and recent empirical evidence regarding the links between openness and inequality in developing countries. It defines openness by the ease and cost with which goods and services, factors of production (e.g., capital, labor, skills), and technology can flow into and out of a country. As is well known, many developing countries have become more open in recent decades according to this definition. The many potential consequences of this trend have been debated extensively in both academic and policy circles. This paper focuses on its consequences for inequalities in income levels between individuals within countries.

An understanding of the links between openness and inequality is important for three reasons. First, when combined with evidence on links between openness and economic growth, it can tell us about the effect of openness on absolute poverty. For example, if we know that openness raises economic growth, but has no effect on the distribution of income, we can be reasonably confident that openness reduces absolute poverty. Second, it can tell us about the likelihood that openness-increasing policies will in fact be implemented. Trade liberalization is less likely to be implemented if the costs associated with it are concentrated on specific groups in society, while the benefits are widely spread—especially if those groups are vocal or influential politically. Third, it tells us more about how openness affects individuals’ and households’ well-being. This is because of widespread evidence that people are concerned not only by their absolute levels of income and consumption, but also by their levels relative to others.

Other surveys of the literature on openness and inequality in developing countries do exist. Wood (1997), O’Conner and Lunati (1999), Arbache (2001), Cooper (2002), and Rama (2003) all review recent theory and empirical evidence relating to the effects of openness on wage inequalities between skilled and less-skilled workers. The contribution lies in updating some of these earlier reviews, and extending the discussion of theory and evidence to include the effects of openness on other sorts of inequalities.

The paper proceeds as follows. Section 2 outlines the various channels through which greater openness can affect inequality in theory, and discusses the mechanisms involved in each case. Section 3 then describes recent evidence

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Regarding the direction and magnitude of these effects in practice, while Section 4 summarizes. Two points of clarification are required at the outset. First, the paper focuses purely on the effects of increased openness on inequality within countries, and ignores any effects on inequality between countries. Second, it focuses purely on the effects of increased openness on inequalities between individuals’ incomes, averaged over time. The extent to which increased openness has affected other inequalities—for example, in levels of income between countries, or in broader measures of well-being within or between countries—are clearly also important issues, but ones which cannot also be addressed adequately in a single paper.

2. THEORY

(a) Basic framework

This section outlines a basic framework for identifying the various channels through which greater openness can affect income inequality. The first step is to link inequalities in income among individuals to inequalities in the ownership of assets or factors of production (e.g., land, capital, labor, skill). We begin by expressing the income of any one individual \(i\) as the sum of their ownership of each factor multiplied by its return. In algebraic terms, this is shown by

\[
y_i = w_{ji} E_j \omega_{ji} + \cdots + w_{ji} E_j \omega_{ji},
\]

where \(y_i\) is the income of individual \(i\), \(w_{ji}\) is the return to factor \(j\) for individual \(i\), \(E_j\) is the total amount of factor \(j\) available in the country, and \(\omega_{ji}\) is the share of the total amount of factor \(j\) owned by individual \(i\). We then derive an expression for overall inequality, under the assumption that the returns to each asset do not vary across individuals (\(w_{ji} = w_j\) for all \(i\)). For instance, dividing each side by total income and summing over the poorest quintile of individuals (by income) yields

\[
\varphi_p = \lambda_j \omega_{p1} + \cdots + \lambda_j \omega_{pj},
\]

where \(\varphi_p\) is the share of national income received by the poorest 20% (one common measure of overall inequality), \(\lambda_j\) is the share of national income received by factor \(j\), and \(\omega_{pj}\) is the share of the \(j\)th factor owned by the poorest 20% (White & Anderson, 2001).¹ Eqn. (2) highlights the fact that, although the underlying sources of income inequality are inequalities in the ownership of assets, the distribution of national income among factors also affects inequality. In particular, if the ownership of some factor \(j\) is distributed more equally than some factor \(k\), an increase in the share of factor \(j\) in national income relative to factor \(k\) will reduce income inequality, and vice versa.

The next step is to link the relative shares of any two factors in national income to their relative return and relative quantity available. In a purely accounting sense, the share of each factor in total income depends on the total amount of it available and its return. In algebraic terms, this is shown by

\[
\lambda_j \equiv \frac{w_j E_j}{Y},
\]

where \(Y\) is national income. This implies that the ratio of any two factor shares in national income is

\[
\frac{\lambda_j}{\lambda_k} = \frac{w_j E_j}{w_k E_k}.
\]

where \(E_j/E_k\) is the relative quantity of the factors \(j\) and \(k\), and \(w_j/w_k\) is their relative return.

The last step is to link changes in relative returns and quantities to shifts in relative demand and relative supply. Assuming a constant elasticity of substitution (CES) production function, we can express the relative demand schedule as

\[
\frac{E_j}{E_k} = a \left( \frac{w_j}{w_k} \right)^{-\sigma},
\]

where \(a\) is a term representing the exogenous level of relative demand (for factor \(j\) relative to factor \(k\)), and \(\sigma\) is the elasticity of substitution between factor \(j\) and factor \(k\). It is then convenient to express the relative supply schedule as

\[
\frac{E_j}{E_k} = b \left( \frac{w_j}{w_k} \right)^{\varepsilon},
\]

where \(b\) is a term representing the exogenous level of relative supply (of factor \(j\) relative to factor \(k\)), and \(\varepsilon\) is the elasticity of relative supply. Under these assumptions, an increase in the demand for some factor \(j\) relative to another factor \(k\) raises their relative return (\(w_j/w_k\)) and their relative shares in national income.
(λ_{j} / λ_{k}). An increase in the supply of some factor j relative to another factor k reduces their relative return, but its effect on their relative shares in national income depends on whether the elasticity of substitution between them is greater or less than unity. 2

A final consideration is that people may differ in the amount by which they adjust their ownership of an asset in response to a change in its return. In this case, changes in relative factor returns will also affect the distribution of factors among individuals, as well as their relative shares in national income, with additional implications for inequality. If, for instance, the elasticity of supply of some factor j relative to another factor k (e.g., human capital relative to unskilled labor) is greater among people who own a large amount of factor j, a rise in its return (relative to factor k) will increase inequality in its ownership, as well as raise its share of national income (and its aggregate relative quantity).

This simple framework suggests therefore that there are two main channels through which an increase in openness could affect overall income inequality. First, it may affect the relative shares of the factors of production in national income, by affecting the relative demand for, or the relative supply of, those factors. Second, it may affect the amount of inequality in the ownership of the factors of production, either by affecting the underlying sources of asset inequality, or by affecting relative factor returns. There are two other channels which may be significant in practice but which cannot be written down simply in the above framework. Greater openness may also affect income inequality by altering gaps between individuals in the returns to a given factor of production, for example between men and women, or between regions, or between rural and urban areas. It may also affect income inequality by altering the ability or willingness of governments to redistribute income via taxes and transfers. We now discuss each of these four channels in more detail.

(b) Openness and relative factor shares

The standard model used by economists to analyze the effect of trade on the relative returns to different factors of production is the Heckscher–Ohlin (HO) model. In its standard and simplest form, its predictions in developing countries are well known: greater openness boosts the demand for unskilled relative to skilled labor, which raises their wage and share of national income relative to skilled labor. Given that unskilled labor is a more equally distributed asset than skill, this reduces overall income inequality.

This hypothesis needs to be qualified in two main ways. On the one hand, there are additional considerations arising from models which, although retaining the central assumptions of HO theory, include more countries or more factors or production. For instance, in HO models which include natural resources as a factor of production (e.g., Leamer, 1987), greater openness may well raise overall inequality in those developing countries which have abundant supplies of those resources (relative to other factors). The reason is that greater openness will raise the relative returns to natural resources in such countries, and that natural resources are typically, although not necessarily, less equally distributed than other assets. 3 Alternatively, in HO models which assume many countries, greater openness will raise the relative demand for skilled labor in any middle-income developing countries whose supply of skilled relative to unskilled labor is higher than the effective world average.

On the other hand, there are additional considerations arising from models which depart from the central assumptions of HO theory. In particular, once we relax the HO assumption that all countries have equal access to the best available production technology, greater openness to that technology may well increase the relative demand for skilled labor, even in low-income developing countries. This might be for three reasons. First, learning and adapting to a new technology is a difficult task which requires the use of skilled labor (Pissarides, 1997). Second, recent technological progress in developed countries—e.g., personal computers, automated assembly lines—has reduced firms’ demand for unskilled labor, and is likely to have the same effect when transferred to developing countries (Berman & Machin, 2000). Third, cheaper access to foreign technology allows developing countries to compete internationally in more skill-intensive goods, which raises their average skill intensity of production, and thus the relative demand for skilled labor (Feenstra & Hanson, 1997). 4

A synthesis of some of these arguments with those associated with traditional HO theory is provided by Wood (2002). He distinguishes be-
tween two different forms of increased openness in developing countries: falling barriers to trade, mainly through lower freight, tariffs, finance, and insurance charges, and falling barriers to movements of know-how, mainly through lower travel and communication (T&C) costs. He assumes two types of labor in developing countries: medium-skilled (E) and unskilled (U), and two types of goods: low-quality non-tradable (B), and high-quality tradable (A). All A-goods require the input of foreign know-how, which comes at a cost, equal to the additional time spent by highly skilled (K) workers based in developed countries traveling to and from, and working in, developing countries.

Under these assumptions, a reduction in T&C costs causes a shift in A-sector production from developed to developing countries, and encourages a reallocation of labor out of the B-sector in developing countries. This either increases or reduces the demand for E-workers relative to U-workers in developing countries, depending on whether new A-sector production requires a higher or a lower ratio of E-workers to U-workers than is available in the B-sector. Lower trade costs, by contrast, cause a reallocation of production within the A-sector, toward goods which require a lower ratio of E-workers to U-workers, which always reduces the demand for E-workers relative to U-workers in developing countries, in accordance with HO principles. The overall impact of openness therefore depends on the balance between reductions in trade costs and reductions in T&C costs, and on the existing relative supply of E-workers in the B-sector.

Two other implications of the Wood (2002) model are worth noting. First, there are interactions between the effects of reductions in trade costs and reductions in T&C costs. In particular, the effect of a decline in trade costs on relative demand is smaller when the level of T&C costs is high. The reason is that, when T&C costs are high, the A-sector accounts for a small proportion of total employment, and a reallocation of labor within it has little impact on the economywide demand for E-workers relative to U-workers. Second, the shift in A-sector production from developed to developing countries also tends (at least initially) to increase the demand for E-workers relative to U-workers in developed countries, as it is the goods which require the lowest ratio of E-workers to U-workers which shift first. It is therefore conceivable that greater openness raises the relative demand for E-workers in both developed and developing countries.

(c) Openness and asset inequality

Greater openness may affect asset inequality via two main channels. The first is via income effects. If greater openness raises the real incomes of poorer groups, this will tend to relax the constraints they face in obtaining credit, increase their investment in asset accumulation, and lower asset inequality. If greater openness reduces the real incomes of poorer groups, the effect works in the opposite direction, tending to raise asset inequality.

The second is via differences between individuals in the amount by which they adjust their holdings of assets in response to changes in the return to those assets. To take the case of human capital, one expectation is that the more human capital people already have, the less responsive they will be to a rise in its return. This might be because they have less time before retiring to benefit from additional human capital, or because they pay a higher opportunity cost for additional time spent out of work acquiring human capital. If this is the case, a rise in the return to human capital will lead to a decline in the amount of inequality in its ownership, and the effect of the rise in the return to human capital on overall inequality will be dampened. However, an alternative scenario is that the more human capital people already have, the more responsive they will be to a rise in its return. This might be because they also possess higher amounts of other assets, and can finance additional spending on education and training by running down other assets (e.g., financial savings) at a constant opportunity cost, without resorting to reductions in other components of household expenditure. If this is the case, a rise in the return to human capital will lead to an increase in the amount of inequality in its ownership, and the effect of the rise in the return to human capital on overall inequality will be reinforced.

As a result, it is not generally possible to predict in advance the effect of a change in the relative returns to some asset, such as human capital, on the amount of inequality in its ownership. However, the former outcome, where a rise in the return to an asset leads to reduction in the amount of inequality in its ownership, is more likely, the easier it is for poorer groups to obtain access to credit. In this case, the relative
advantage of wealthier groups in financing additional investments in human capital (or other assets) will be lower.

(d) Openness and spatial inequality

Understanding of disparities in income and factor prices between regions has expanded rapidly in recent years thanks to developments in the field of economic geography. One hypothesis is that income disparities between regions within a country are smaller if the country is well integrated into international trade (Fujita, Krugman, & Venables, 1999). The reasoning is as follows: Under a policy of import substitution, domestic firms will prefer to locate close to national centers of final demand and intermediate inputs, in order to lower transport costs. As they do so, they encourage other firms to do the same, setting in motion a process of cumulative causation, leading to a concentration of population and economic activity in one region, and an increase in gaps between regions in the real earnings of immobile factors of production (e.g., land). Following trade liberalization, however, firms can make use of foreign sources of demand and intermediate inputs. Assuming that access to foreign markets is similar across regions within a country, this reduces firms’ incentives to locate in the core region and reduces the concentration of economic activity there. Gaps between regions in the real earnings of immobile factors decline as a result.

Although not directly concerned with spatial inequality, the effects of trade on the sectoral structure of production predicted by the HO theory may have indirect effects on inequality between urban and rural areas. In countries with a comparative advantage in manufactures, greater openness raises the returns to human resources relative to natural resources. This will tend to increase average income gaps between urban and rural areas, because the ratio of human to natural resources is typically higher in urban areas than in rural areas (on account of the fact that manufacturing typically concentrates in urban areas, while primary production is typically tied to rural areas). The opposite—that is, a narrowing of average income gaps between urban and rural areas—will occur in countries with a comparative advantage in primary products.

(e) Openness and gender inequality

Where men and women have different average skill levels, increased openness will affect the size of wage gaps between men and women through its effect on the size of wage gaps between skilled and unskilled labor. However, it may also affect the “residual” gender wage gap, namely that proportion of the gender wage gap which remains after controlling for measured gaps in skill levels between men and women. It has been argued, for example, that the expansion of manufactured exports has increased the demand for female relative to male labor in developing countries. This is either because female workers are perceived by exporting firms as less likely to make demands for improved wages and/or working conditions, or because women possess a comparative advantage relative to men in performing the light industrial tasks associated with developing country exports such as clothing, footwear, and basic electronics. In either case, the consequence of increased openness will be an increase in women’s labor market participation and wages relative to men. It is also argued that, by increasing competition in product markets, increased openness to trade will reduce wage gaps between men and women based on discrimination (Becker, 1971).

However, there may be offsetting effects. First, increases in the relative earnings and employment opportunities of women may be offset by a decline in their leisure time, in absolute terms and relative to men (Fontana & Wood, 2000). Second, where agriculture predominates in export activity, women may not benefit directly from increased openness, either because their property rights in land are limited, or because they have limited access to credit, inputs, and marketing channels (Fontana, Joekes, & Masika, 1998). For these reasons, impacts of openness on gender inequality are in practice more likely to be mixed, depending in particular on the type of goods a country exports and on institutions governing women’s access to land and other productive assets.

(f) Openness and redistribution

Most economists believe that governments in open economies should engage in some form of income redistribution, for purely instrumental reasons. The reason is that unless the people who are made worse off by trade, in absolute
terms, are compensated in some way by those who gain, they will prevent a policy of free trade from being implemented, and the aggregate gains from free trade from being realized. Of course, many people also believe that governments should redistribute income from richer to poorer citizens as an independent goal in itself.

It has been argued that greater openness reduces the ability of national governments to redistribute income (e.g., Rodrik, 1997; Rodrik & van Ypersele, 1999). The main argument is that as some factors of production (e.g., capital, highly skilled labor) become internationally mobile, they become more sensitive to differences between countries in the amount of tax they have to pay. Any attempt to raise taxes on their earnings will simply cause them to relocate to countries where taxes are lower. The result is that the tax burden is shifted onto immobile factors of production (e.g., land), and redistribution from mobile to immobile factors becomes impossible.

Again however, the argument needs qualifying. First, it is not that national governments in open economies cannot redistribute (from mobile to immobile factors of production), it is that they cannot do so by more than other open economies. If all countries have similar ideas about the amount of redistribution they would like to achieve, and set taxes accordingly, there is no conflict between redistribution and openness. Second, in the presence of agglomeration forces, even perfectly mobile capital becomes “tied” to specific locations and integration need not lead to falling tax rates (Baldwin & Krugman, 2000).

3. EVIDENCE

This section describes the empirical research which has been undertaken in recent years toward testing the various hypotheses about the effects of greater openness on inequality within developing countries described in the previous section.

(a) Openness and aggregate inequality

Several studies have tested hypotheses outlined in the previous section using aggregate measures of overall inequality, such as the Gini coefficient or the share of the poorest 20% in national income. Details of some of these are shown in Table 1. Attention is restricted to published studies using the Deininger and Squire (D&S) (1996) dataset, or recent extensions of it, and which have regressed the level of openness on the level of inequality, the change in openness on the change in inequality, or some combination of the two. A distinction is drawn between tests of the three different hypotheses. The first is that greater openness raises overall inequality in all countries. Section 2(b) showed that this hypothesis can be derived from recent theoretical models including Feenstra and Hanson (1997) and Wood (2002). Tests of this hypothesis involve regressions of the form:

\[ \text{INQ}_{it} = \alpha_0 + \alpha_1 \text{OPEN}_{it} + \alpha_2 \text{Z} + \varepsilon_{it}, \]  

where \( \text{INQ} \) is an aggregate measure of inequality, \( \text{OPEN} \) is a measure of a country’s openness to international trade or capital flows, and \( \text{Z} \) is a set of control variables also thought to affect inequality. Support for the hypothesis requires that \( \alpha_1 > 0 \).

The second hypothesis is that greater openness reduces overall inequality in developing countries, but increases overall inequality in developed countries. This hypothesis is typically derived from the basic HO model of trade outlined in Section 2(b), in which developed countries have an abundant supply of skilled relative to unskilled labor, and developing countries have an abundant supply of unskilled relative to skilled labor. Tests of this hypothesis involve regressions of the form:

\[ \text{INQ}_{it} = \beta_0 + \beta_1 \text{OPEN}_{it} + \beta_2 \text{OPEN}_{it} \cdot Y_{it} + \beta_3 \text{Z} + \varepsilon_{it}, \]  

where \( Y \) is a qualitative or quantitative measure of development, such as OECD/non-OECD (qualitative) or GDP per capita (quantitative). The coefficient \( \beta_2 \) measures the direction and amount by which the effect of openness on inequality varies by level of development. The coefficient \( \beta_1 \) measures the effect of openness on inequality when \( y \) is zero (equal to its effect at all other values if \( \beta_2 = 0 \)). Support for the hypothesis requires that \( \beta_1 < 0 \) and \( \beta_2 > 0 \).

The third hypothesis is that the effects of greater openness on overall inequality vary, depending on the factor endowments of the country opening up. This hypothesis is derived from HO models with many countries (see, for example, Wood, 1997). In such models, the higher is the endowment of any one factor relative to labor, the greater (more positive or less negative) will be the effect of an increase in
openness on the return to factor \( j \), and the share of factor \( j \) in national income, relative to labor. Because labor is the most equally distributed asset, this in turn implies that the higher is the endowment of any one factor \( j \) relative to labor, the greater (more positive or less negative) will be the effect of an increase in openness on overall inequality. Tests of this third hypothesis therefore involve regressions of the form:

\[
INQ_{it} = \chi_0 + \chi_1 OPEN_{it} + \chi_{2j} OPEN_{it} \cdot E_{ijt} \\
+ \beta_3 Z_{it} + \epsilon_{it},
\]

where \( E \) is a set of variables measuring the factor endowments of country \( i \), all relative to labor. Each coefficient \( \chi_{2j} \) measures the direction and amount by which the effect of openness on inequality varies according to a country’s endowment of factor \( j \) (relative to labor). Support for the hypothesis requires that each \( \chi_{2j} \) is positive.

Even when distinguishing between these different types of studies, there remains considerable variety among them, in the measure of openness used, the countries and periods included in the sample, and the econometric strategy, making the results difficult to compare. However, it is possible to draw three broad conclusions. First, there is almost no support for the first hypothesis, that greater openness raises aggregate inequality in all countries. Its null cannot be rejected in the studies by White and Anderson (2001), Ravallion (2001), Dollar and Kraay (2002), Edwards (1997), and Calderon and Chong (2001). The two exceptions where its null can be rejected are Barro (2000) and Lundberg and Squire (2003). Second, there is conflicting evidence regarding the second hypothesis. Calderon and Chong (2001) find that greater openness does reduce inequality in developing countries. However, Barro (2000) and Ravallion (2001) both find that the effect of openness on inequality declines as per capita GDP increases. Moreover, Dollar and Kraay (2002), Edwards (1997), and Higgins and Williamson (1999) all find no significant effect of openness on inequality at any level of development. Finally, there is qualified support for the third hypothesis. In particular, both Spilimbergo, Londono, and Szekely (1999) and Fischer (2001) find that the effect of openness on inequality increases as countries’ endowments of human capital increase. However, they also both find that the effect of openness declines as countries’ endowments of capital increase, and that the effect of openness is unaffected by countries’ endowments of arable land per capita (as do Dollar & Kraay, 2002).

Further empirical work along these lines would be useful. There is scope for extending tests of the third hypothesis, for example, by testing the interaction of openness measures with a wider range of factor endowment measures. There is also scope for testing the predictions of the Wood (2002) model, which would involve including measures of both openness to trade and openness to foreign technology and know-how. However, studies of the effects of openness on aggregate inequality do suffer certain inherent drawbacks. First, there are concerns regarding the quality of the underlying data. Although most studies using the Deininger and Squire (1996) dataset restrict the analysis to “high-quality” observations, there remain differences in survey design between countries and over time (income- vs. expenditure-based; personal vs. household income; gross vs. net income) which reduce levels of statistical significance. Second, there is the possibility that any observed impact of openness on inequality is spurious, because observable indicators of openness are correlated with unobserved variables which may also affect inequality. Perhaps most importantly, they tell us little about the channels through which openness affects inequality—through relative factor returns, spatial or gender inequality, government redistribution, asset inequality, and so on—information which is important to policy makers.

(b) Openness and relative factor returns

There has been a large amount of research into the effect of openness on one particular factor price ratio, the wage of skilled relative to unskilled labor. Details of some of these studies are shown in Table 2. Attention here is restricted to publicly accessible, time-series studies which span a period of at least five years, which use either education attainment, occupation, or the wage itself as a proxy for skill level, and which make some attempt to measure the effect of increased openness on any change in the relative wage.

Among these, a distinction can again be drawn between tests of three different hypotheses. The first is that reductions in barriers to trade reduce the relative demand for skilled labor, by shifting the structure of production
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<td>S&amp;W (1995) 5-Year PAs, 1965–90, N = 66</td>
<td>CAPITAL, EDUC, LAND</td>
<td>( \chi_j &gt; 0 ) (EDUC), ( \chi_j &lt; 0 ) (CAPITAL), ( \chi_j = 0 ) (LAND)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measure of inequality: Gini = Gini coefficient; Q1 = share of 1st (poorest) quintile in national income, Q2 = share of 2nd quintile in national income, ..., Q5 = share of 5th (richest) quintile.

Measures of openness: S&W (1995) = Sachs and Warner (1995). The trade-GDP ratio is the sum of the value of imports and exports, divided by GDP. The adjusted trade-GDP ratio is the residual value of this variable obtained from a regression of the actual trade-GDP ratio on geographical characteristics.

Sample: All studies use data from both developed and developing countries. DAs = decade averages, PAs = period averages, SYs = single years, N = number of countries in sample.

Controlling variables: Quantitative: AGE = age structure of population, BLPREM = black market premium on exchange rate, CAPITAL = capital per worker, EDUC = education per worker, ETHNIC = ethno-linguistic fragmentation, FINANCE = financial sector development, GDPpc = GDP per capita, GDPpc2 = GDP per capita squared; GDPpcw = GDP per worker, GDPpcw2 = GDP per worker squared, GOV = government size (% of GDP), INFL = inflation, LAW = rule of law, LAND = arable land per capita, LE = life expectancy, LGINI = Gini coefficient of land holdings, POL = political and civil liberties, RER = real exchange rate, TOT = terms of trade, URBAN = urban population (% of total). Qualitative: LA = Latin America, AFR = Africa, REGION = all regions, OBYTPE = type of inequality observation (gross/net income, personal/household, income/consumption).

Results: >0 indicates a coefficient is statistically significant and positive; <0 indicates a coefficient is statistically significant and negative; =0 indicates a coefficient is not statistically significant.
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<td>Robbins (1996)</td>
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<td>Beyer et al. (1999)</td>
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<td>te Velde (2003)</td>
<td>(a) Chile, Bolivia, Costa Rica, Colombia (b) Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Uruguay, Venezuela</td>
<td>(a) 1978–2001* (b) 1990–99*</td>
<td>(a) Household surveys (b) ECLAC (2002) wage data</td>
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Notes: * Exact years vary by country. ** Exact measure of skill varies by country.
toward more labor-intensive sectors, as predicted by standard HO theory. The second is that reductions in barriers to foreign investment increase the relative demand for skilled labor, by shifting the structure of production toward more skill-intensive sectors, as predicted by Feenstra and Hanson (1997) and, in some cases, Wood (2002). The third is that reductions in barriers to trade and investment increase the relative demand for skilled labor, by increasing the use of foreign, skill-biased, technologies by individual firms and enterprises, as predicted by Pissarides (1997) and Berman and Machin (2000).

Two main empirical approaches have been used to test these hypotheses. The first is the “supply-and-demand” approach. This begins by assuming that the quantity of skilled relative to unskilled labor is unaffected by their relative wage. In this case, Eqn. (5) in Section 2(a) can be re-expressed as

\[
\ln \left( \frac{w_s}{w_u} \right) = \ln(a/\sigma) - \frac{1}{\sigma} \ln \left( \frac{E_s}{E_U} \right), \tag{10}
\]

where \(E_s/E_U\) is the supply of skilled relative to unskilled labor (assumed exogenous), \(a\) is the demand for skilled relative to unskilled labor, \(w_s/w_u\) is the relative wage, and \(\sigma\) is the elasticity of substitution between skilled and unskilled labor. One can then test econometrically whether a proxy measure of openness to trade (e.g., imports of capital equipment) raises the relative demand for skilled labor. \(10\) Examples of this approach include Gorg and Strobl (2002), Mazumdar and Quispe-Agnoli (2002), Feenstra and Hanson (1997), and Berman and Machin (2000). The “supply and demand” and “cost-function” approaches are not the only ways of linking increased openness to changes in relative wages; others include the “mandated wage approach” (e.g., Robertson, 2000), and the more discursive approaches of Wood (1994), Hanson and Harrison (1999), Green, Dickerson, and Saba Arbache (2001), and Gindling and Robbins (2001).

What do the results of these studies show? Wood (1994) shows that the relative wage of skilled workers narrowed in Taiwan, South Korea and Singapore after they shifted to export-oriented strategies during the 1960s and 1970s, although they did not in Hong Kong, mainly because the relative supply of unskilled labor was boosted by immigration from China. Robbins (1996), however, shows that the relative demand for skilled workers rose during episodes of trade liberalization in Argentina, Costa Rica, Colombia, Chile, Mexico, and Uruguay during the 1980s and the early 1990s. This was confirmed by subsequent studies on Chile and Costa Rica (Beyer et al., 1999; Gindling & Robbins, 2001; Robbins & Gindling, 1999). Green et al. (2001) show that the relative demand for college-educated workers also rose significantly in Brazil during the first half of the 1990s, a period of substantial trade liberalization. On this basis therefore, there is little support for the hypothesis that reductions in barriers to trade reduce the relative demand for skilled labor.

It is possible, however, that by the 1980s and the early 1990s, the supply of skilled relative to unskilled labor in most Latin American coun-
tries was higher than the effective world average. In this case, HO theory predicts that reductions in barriers to trade will increase the relative demand for skilled labor. Evidence consistent with this hypothesis is found by Hanson and Harrison (1999) and Robertson (2000), who show that in Mexico prior to liberalization, tariffs were highest in labor-intensive sectors, suggesting that Mexico did not have a comparative advantage in labor-intensive products. Robertson (2000) finds that the reduction in the relative price of labor-intensive products caused by liberalization can account for 50% of the rise in the relative wage of skilled labor. In other words, the lack of empirical support for the first hypothesis does not in itself amount to a rejection of HO theory.

Nevertheless, there is more direct evidence to support the second and third hypotheses, that reductions in barriers to trade and foreign investment increase the relative demand for skilled labor, either by shifting the structure of production toward more skill-intensive sectors, or by increasing the use of foreign, skill-biased, technologies by individual firms and enterprises. With regard to the former, Feenstra and Hanson (1997) themselves show that the relative demand for skilled workers in Mexico is positively affected by the number of foreign manufacturing establishments, and by te Velde and Morrissey (forthcoming) and te Velde (2003), who show that the stock of foreign direct investment (FDI) has a positive and significant effect on the relative demand for skilled workers in Chile, Bolivia, and Thailand (although it also has a negative and significant effect in Hong Kong, the Philippines, and Colombia, and no significant effect in South Korea, Singapore, or Costa Rica). With regard to the latter, Mazumdar and Quispe-Agnoli (2002) and Gorg and Strobl (2002) show that industries or firms in Peru and Ghana, respectively, which use more imported foreign equipment employ a higher ratio of skilled relative to unskilled workers. It is also supported by Robbins (1996), who shows that the size of the imported capital stock has a positive and statistically significant effect on the relative demand for university graduates, in a pooled sample including Argentina, Chile, Colombia, Costa Rica, Malaysia, and the Philippines, and by Robbins and Gindling (1999), who obtain a similar result using time-series data for Costa Rica. Berman and Machin (2000) show that the share of skilled wages in the total manufacturing wage bill increased during the 1980s in 10 out of 14 low- and middle-income countries for which they were able to collect data. The exceptions were Malaysia and India (where it declined), and Chile and South Korea (where there was no significant change).

Further research along these lines would be useful. There is a particular need for more research on low-income countries. There is evidence that the relative wage of skilled labor has risen in some low-income countries in recent years, including Ghana (Gorg & Strobl, 2002; Teal, 2000), Nicaragua (te Velde, 2003) and, depending on the measure of the relative wage used, Vietnam (Gallup, 2002), trends which clearly cannot be explained by HO theory. However, other than the study by Gorg and Strobl, there have been no attempts to assess the effect of increased openness on these trends. More research is required to assess whether relative wages have risen in other low-income countries, and if so why. That there have been significant increases in employment in formal exporting sectors in several low-income countries following liberalization is now well documented (e.g., Jenkins & Sen, 2003). We still know little about whether, and if so how, greater openness has affected other factor–price ratios, such as the return to land (and other natural resources) relative to labor, skilled or unskilled, in low- or middle-income countries. Movements in this latter ratio may in fact have a much larger impact on overall inequality in Africa and Latin America, with their relatively abundant supplies of land and other natural resources.

(c) Openness and asset inequality

There have been few empirical attempts to link openness and asset inequality. One exception is Wood and Ridao-Cano (1999). They find that openness had a negative effect on enrollment rates in secondary and tertiary education during 1960–90 in countries with low levels of educational attainment. This is the direction of change one would expect if increased openness reduces the relative return to secondary and tertiary education in countries with low levels of education, as HO theory predicts, and if the supply of education is at least partly responsive to its return. They also find that openness has had little significant effect on enrollment rates in primary education, which implies that inequalities in levels of educational attainment in low-education countries have been reduced by increased openness.
Further research along these lines would also be useful. Wood and Ridao-Cano (1999) do not provide a direct test of the hypothesis that a fall in the labor market returns to secondary and tertiary education caused the decline in the secondary and tertiary enrollment rates, although their evidence is consistent with the fact. There also remains little direct evidence about the extent to which the responsiveness of the supply of education to changes in its return varies, either among countries or among individuals within countries according, for instance, to the availability of credit for education expenditures or government expenditure on basic education.

(d) Openness and spatial inequality

It is now well known that inequalities in income between regions and between rural and urban areas within developing countries are often very large. Unfortunately, we know much less about whether these disparities have been changing in recent years, and even less about whether any changes are linked to greater openness. However, IFAD (2001) show that ratios of rural to urban poverty have risen in many South and East Asian countries since 1985, especially in China, while in Africa, rural–urban poverty ratios have fallen. The same broad pattern is also found by Eastwood and Lipton (2000). This pattern is consistent with the indirect effects one would expect increased openness to have on the basis of HO theory, operating through changes in the relative demand for the different factors of production. Broadly speaking, the comparative advantages of most South and East Asian countries lie in manufactures (Mayer & Wood, 2001), while the comparative advantages of the majority of African countries lie in primary products (Wood & Mayer, 2001). Establishing the precise magnitude of these effects would, however, require more research.

Evidence regarding the links between openness and spatial inequality predicted by new economic geography models remains limited. Ades and Glaeser (1995) show that, in a sample of 85 countries, the population of the largest city is negatively related to the share of imports in GDP, and positively related to the extent of tariff barriers. They do not, however, examine the link between the extent of urban concentration and income inequality. Hanson (1997) shows that the concentration of manufacturing industry in Mexico around Mexico City—in 1980, the capital accounted for more than 40% of the country’s manufacturing employment—declined following trade liberalization and integration into NAFTA. At the same time, the amount by which the wages paid by manufacturing firms in the capital exceeded other regions declined. However, this evidence relates to nominal rather than real wage differentials. There is a potential for further work, on different countries and real as well as nominal income differentials.

(e) Openness and gender inequality

There are relatively few estimates of the effect of openness on gender wage differentials. In a recent cross-country study based on occupational wage data from the ILO October Inquiry, Oostendorp (2004) finds that higher trade and FDI net inflows caused gender wage gaps in relatively low-paid occupations in low and lower-middle income developing countries to narrow. Rama (2001) finds that the gender gap in earnings (controlling for educational attainment and work experience) declined from 39% to 26% in Vietnam during the 1990s (a period of trade liberalization), while Artecona and Cunningham (2001) report a similar change associated with trade liberalization in Mexico. Tzannatos (1999) shows that male–female wage gaps fell at an average rate of 1% per year in a sample of 12 developing countries between the late 1970s and the early 1990s. These studies support the hypotheses outlined in Section 2(e) as to why increased openness may narrow gender wage gaps.

At the same time, however, Seguino (1997, 2000) finds that the gender wage gap narrowed only marginally in South Korea between 1975 and 1990, despite an average increase in exports of 15% per year, while Berik, Rodgers, and Zveglich (2002) find that rising import shares in Taiwan during 1981–99 caused the wage gap between men and women (controlling for observed productivity differences) to widen. The hypothesis that greater openness reduces the gender wage gap is therefore not always supported by the evidence.

(f) Openness and redistribution

Evidence of links between openness and fiscal redistribution is difficult to come by, not least because it is difficult to measure the extent to
which governments do in fact redistribute income. The reason is that the people who are legally responsible for paying a tax are often not the same people who ultimately bear the tax. Calculating the real burden of taxation instead requires detailed knowledge of elasticities of supply and demand, and the structure of markets more generally, which is often lacking in developing countries (Shah & Whalley, 1991).

If greater openness has reduced the ability of governments in developing countries to redistribute income, we would, at the very least, expect to see a combination of lower taxes on capital owners, highly skilled workers, and corporations, and higher taxes on land and less-skilled labor; multinational corporations adjusting their location decisions in response to differences in taxes and wage rates; and taxes on capital income in one country influencing rates set in another. As yet, we do not have any convincing evidence one way or the other. Evidence for OECD countries suggests that tax rates on labor income are higher in more open economies, and tax rates on capital income lower (Rodrik, 1997), that reductions in corporation tax in one country increase the likelihood of reductions in another (Devereux, Lockwood, & Redoano, 2002), and that the responsiveness of the demand for labor to changes in wages has increased in recent decades (Slaughter, 2001). These results are all consistent with the hypothesis that greater openness has reduced the ability of governments to redistribute income. However, Wheeler and Mody (1992) find that rates of corporate taxation had only limited impact on the locational choices of US multinationals during the 1980s, compared to other variables including the quality of infrastructure, market size, and the number of other foreign investors. This finding suggests the governments in fact have more flexibility in setting tax rates than is typically thought.11

4. CONCLUSION

There are several channels through which an increase in the openness of a country, to international flows of goods and services, factors of production, and technology, can affect inequalities in income between individuals within it. Most of the theoretical work linking greater openness to domestic inequality focuses on its effect on the relative demand for domestic factors of production, and in particular, the demand for skilled relative to unskilled labor. There is less theoretical work linking increases in openness to domestic inequality via other channels. Those links may nevertheless be significant. Greater openness can affect asset inequality by affecting the real incomes of credit-constrained groups, or by affecting relative factor returns. Greater openness can also affect gaps between regions in the real incomes of immobile factors of production, by affecting the spatial concentration of economic activity. Greater openness can also reduce “residual” wage gaps between men and women, at least in theory, by increasing the relative demand for female labor or by reducing discrimination. Finally, greater openness may affect inequality by reducing the ability of the government to redistribute income via taxes and transfers.

Recent years have witnessed many empirical studies on the effects of openness on inequality in developing countries. This body of work has suggested something of a puzzle. On the one hand, several detailed time-series studies of individual (or small groups of) developing countries have shown that increased openness has raised the relative demand for skilled labor. On the other hand, cross-country econometric evidence suggests that increased openness has had little impact on overall inequality in developing countries, when controlling for other observable influences on inequality. This is a puzzle, because we would expect a rise in the relative demand for skilled labor to increase overall inequality, all else being equal.

There are, broadly speaking, two plausible explanations for this puzzle. One is differences in samples. Most cross-country studies focus on the period since the 1960s, and include low- and middle-income countries, while the time-series studies have focused mostly on the 1980s and 1990s, and cover mostly middle-income countries. HO theory predicts that increased openness will increase the relative demand for skilled labor in many middle-income developing countries, especially in those which became more open during the 1980s and 1990s (following the entry of more low-income countries into world markets, e.g., China, Indonesia, and Bangladesh). It is possible therefore that in the cross-country econometric analysis, the positive effect of openness on inequality in middle-income countries during the 1980s and 1990s is offset by a negative impact in middle-income countries during the
1960s and 1970s, and in low-income countries during the 1980s and 1990s. 12

The other plausible explanation is offsetting effects. Greater openness may affect inequality through several channels, of which changes in the relative wage of skilled labor is only one, and not necessarily the most important, in terms of accounting for changes in overall inequality. Given the evidence discussed in Sections 3(c)–3(e), increases in the relative demand for skilled labor could plausibly have been offset by reductions in the average wages of men relative to women, in average incomes in core relative to peripheral regions, and in the level of inequality in the ownership of human capital.

These explanations remain hypotheses, and their testing will require further research. There are, in particular, two main priorities: first, whether greater openness has also raised the relative demand for skilled labor in low-income countries in recent decades, and second, whether greater openness has affected domestic inequality through other channels, in either low- or middle-income countries. A greater understanding as to which groups have been made relatively worse off and which have been made relatively better off through increased openness, and in which countries, will assist policy makers in designing compensatory mechanisms aimed at ensuring a fair distribution of the aggregate net benefits of increased openness.

NOTEs

1. One can express another common measure of inequality, the Gini coefficient, in a similar way (Fei, Ranis, & Kuo, 1978).

2. For other production functions (e.g., the translog), or under alternative assumptions regarding the precise form of Eqn.(6), these relationships will typically be more complicated. Nevertheless, the broader point remains, that changes in the relative shares of the different factors of production in national income are driven by exogenous shifts in the relative demand for, and relative supply of, those factors.

3. HO models which include physical capital as a factor of production generally predict that greater openness reduces overall inequality in developing countries. This is because most developing countries are capital scarce by world standards (so that greater openness reduces the returns to capital relative to labor), and because capital is, almost always, a less equally distributed asset than labor (so that a fall in the share of capital relative to that of labor in national income reduces overall inequality). Many HO models do not include physical capital as a factor of production, however, on the grounds that it is much more internationally mobile than other factors of production (see Wood, 1994, pp. 32–40, for further discussion).

4. One might also relax the assumption of fully competitive product and labor markets. In models which include wage bargaining, the wages of less-skilled workers are affected by the extent of their bargaining power over firms. Greater openness may reduce that bargaining power, by increasing firms’ ability to relocate or outsource production overseas, and therefore lower the returns to less-skilled labor relative to other, more mobile, factors of production (Mezzetti & Dinopoulos, 1991; Rodrik, 1997).

5. Similar arguments can be applied to other assets, such as land. One would expect, for example, that land-owning households will increase their investments in the quality of land when the returns to land increase, but that the size of this response will differ across households, causing the (quality-adjusted) distribution of land ownership to change.

6. The literature on fiscal decentralization has argued that, because of the internal mobility of economic units, central rather than state or local government should be responsible for income redistribution (e.g., Musgrave, 1959). However, there are theoretical arguments for income redistribution at the state or local level, and in practice many state and local governments do engage in a significant amount of redistribution (see Oates, 1999, pp. 1121–1122, for more details).

7. Most studies use only “high-quality” observations, defined as those which are based on household surveys, cover all sources of income, and are representative of the population at the national level. Estimates of Gini coefficients and income shares still vary, however, according to whether household surveys are income based or expenditure based, refer to net or gross income, or are based on individual-level or household-level data. Most, although not all, studies control for this source of variation.
8. The limitations of the many different measures of openness, including policy measures (e.g., tariff averages) and outcome measures (e.g., trade/GDP ratios) are discussed by Rodriguez and Rodrik (2000) and Rodrik (2000), in the context of studies testing for links between openness and aggregate economic performance. Such limitations apply equally to the studies reviewed in Table 1.

9. The analysis is usually carried out using national-level data on relative wages and relative supply, which makes the assumption of exogenous relative factor supplies more reasonable. Sometimes a value of the elasticity of substitution between skilled and unskilled workers is assumed a priori, based on the results of previous studies. This is then used to impute changes in relative demand over time, on which proxy measures of openness are then regressed.

10. This analysis is usually done using time-series data on individual firms, or narrowly defined industries, which makes the assumption of exogenous relative wages more reasonable.

11. Rodrik (1998) shows that openness has a positive effect on the size of the government, as measured by government consumption, investment or employment, or by the tax–GDP ratio. He argues that this is because openness increases external risk, and because citizens demand that governments grow in size as a way of insuring against such risk. The provision of such insurance by governments need not, however, imply a redistribution of income.

12. The entry of large low-income countries into the world market is the explanation favored by Wood (1997) for a related conflict in the evidence, described in Section 3(b), namely that time-series studies of the East Asian experience in the 1960s and 1970s suggest that greater openness narrowed wage differentials between skilled and unskilled labor, while similar studies of the Latin American experience in the 1980s and the early 1990s suggest that greater openness widened those differentials.

REFERENCES


impacts. BRIDGE Report 42, Institute of Development Studies, University of Sussex.


