

DESA Working Paper No. 50

ST/ESA/2007/DWP/

August 2007

What we do and don't know about trade liberalization and poverty reduction*Rob Vos*

Abstract

Strong opinions about the impact of globalization on poverty are not always backed by robust factual evidence. As argued in this paper, however, it is not all that easy to lay our hands on 'robust' facts. Quantitative analyses of trade liberalization appear highly sensitive to basic modelling and parameter assumptions. Altering these could turn the expectation that, for instance, Africa's poor stand to gain from further trade opening under the Doha Round into one in which they would stand to lose. Most studies agree though that trade opening probably adds to aggregate welfare, but gains are small and unevenly distributed.

JEL Classification: C68; F13; F15; F16; I3; O19; O24

Keywords: Computable General Equilibrium Models; Trade Policy; Economic Integration; Trade and Labour Market Interactions; Welfare and Poverty; International Linkages to Development; Foreign Exchange Policy

Rob Vos is the Director of the Development Policy and Analysis Division of the United Nations Department of Economic and Social Affairs (UN/DESA). E-mail: vos@un.org.

Comments should be addressed by e-mail to the author.

Contents

Introduction.....	1
Some theoretical notions and the empirical evidence.....	2
Trade and economic growth.....	2
Trade liberalization and poverty.....	4
Modelling issues.....	7
On key parameters and trade functions: Armington specifications of trade linkages.....	7
Labour market assumptions.....	9
Macro closure rules.....	10
Dynamics.....	12
Transitional problems and volatility.....	12
Poverty analysis.....	12
Conclusions.....	13
References.....	15

UN/DESA Working Papers are preliminary documents circulated in a limited number of copies and posted on the DESA website at <http://www.un.org/esa/desa/papers> to stimulate discussion and critical comment. The views and opinions expressed herein are those of the author and do not necessarily reflect those of the United Nations Secretariat. The designations and terminology employed may not conform to United Nations practice and do not imply the expression of any opinion whatsoever on the part of the Organization.

Typesetter: *Leah McDavid*

United Nations
Department of Economic and Social Affairs
2 United Nations Plaza, Room DC2-1428
New York, N.Y. 10017, USA
Tel: (1-212) 963-4761 • Fax: (1-212) 963-4444
e-mail: esa@un.org
<http://www.un.org/esa/desa/papers>

What we do and don't know about trade liberalization and poverty reduction¹

Rob Vos

“The only thing I know, is that I don't know anything”

- Socrates -

Introduction

When I thought about a short answer to the main theme question for this session, I could not come up with anything better than a Socrates-like response. As about 150 countries have signed up as WTO members now, the world seems set for further trade liberalization. But multilateral negotiations under the Doha round have stalled and much of the controversy is about the development agenda and in many ways along the traditional North-South, rich-poor country dividing lines. On the one hand, there is the developed world which is resisting full liberalization of its agricultural sectors and the lifting of not only export subsidies, but in particular also domestic production subsidies, while at the same time demanding greater access to developing country markets for manufactures and services. On the other hand, there are two developing country camps. One consisting of large developing countries, such as India, China, Argentina and Brazil, which hope to reach an agreement that allows protection and development policies in precisely those manufacturing and services sectors, while demanding substantial reductions in OECD country tariffs and subsidies on agricultural products. The other developing country group is that of the poorest countries, often heavily dependent on aid and primary commodity exports, who feel the need to defend their preferential trade agreements and demand more policy space to conduct policies promoting exports and export diversification.

This is, of course, a rather simplified sketch of the divide, but it does reflect different perceptions as to how further trade liberalization would contribute to welfare increases on each side of the fence and, in addition, for the developing countries whether it will contribute to poverty reduction. Gains, if they are there, are often presented as aggregate welfare improvements, but the losers may not see societal gains as relevant to their fate and therefore perceive trade opening as such as something non-beneficial. Much rigorous analytical work has not helped to overcome such controversies because, no matter how rigorous the instruments, our analytical tools are in the end creatures of our own perceptions of how the world works, and outcomes of our trade models pretty much depend on those perceptions underlying the model's assumptions.

Nonetheless, in general, most empirical studies tend to find on balance that trade opening most often produces overall average income gains for the economy, but the overall gains tend to be rather small, particularly when measuring the impact in terms of economic growth and considering the present-day context where in many countries much of trade has already been pretty much liberalized. The implications for poverty reduction are less clear, though. This is in part because many studies do not look at the effects for sub-groups within society. This holds in particular for global trade models which tend to confine the assessment to aggregate welfare gains across countries. Studies that do look into the implications for sub-groups give a mixed picture for a variety of reasons: some methodological, some empirical. More in particular, the effects on income distribution seem to be mixed. As with the average income gains, however, also here, in most cases, the poverty effects tend to be small as far as we can tell from the existing evidence.

1 Paper presented at the 'Trade and Poverty' Policy Forum organized by the Inter-American Development Bank (IDB) and the Poverty and Economic Policy Research Network (PEP), Lima, Peru, 12 June 2007.

As mentioned, however, outcomes vary across studies: many stem from methodological differences and not just from differences in economic contexts. Luckily many of the methodological issues I will address further below are well recognized. So in this sense, we know a lot, in particular about the limitations of our assessment methods. This observation may not be very helpful for policy makers, of course, especially if they are confronted with a variety of outcomes from different studies which fail to make clear to what extent the findings are sensitive to the assumptions made, and which of these matter most to determine which findings seem to be most plausible. Without trying to be comprehensive, let me take you through what I consider to be the some of the key issues at stake.

Some theoretical notions and the empirical evidence

Trade reforms have been justified by expected increases in efficiency and output growth. The governments and international institutions promoting them have been less explicit, however, about their distributional consequences. During the 1990s, the predominant view was that liberalization would likely lead to better economic performance, at least in the medium-to-long run. According to this view, even if there are adverse transitional impacts, they can be cushioned by social policies and, in any case, after some time has passed they will be outweighed by more rapid growth. However, neither perceived theory nor the available empirical evidence confirm this will necessarily be the case. Let me start with some analytical issues.

Trade and economic growth

Also from a theoretical perspective, the welfare gains from trade liberalization and free trade agreements (FTAs) are not obvious. In the standard approach of the old trade theory, the Viner-Meade version of the Heckscher-Ohlin-Samuelson (HOS) framework applied to customs unions, three effects are seen to determine the aggregate welfare outcomes of FTAs: (i) “trade creation” as a result of changes in commodity trade in the countries within the customs union; (ii) “trade diversion” caused by changes in trade between the customs union and the rest of the world; and (iii) “terms-of-trade” effects triggered by changes in international prices facing the countries. Trade creation and terms-of-trade gains are in general welfare-enhancing for countries within the customs union, whereas trade diversion and terms-of-trade losses are potentially damaging to countries outside the union. This turns the question whether an FTA is welfare-increasing into an empirical one. From their comprehensive review of theory and empirical literature on regional trade agreements, Burfisher et al., (2004) draw two, what they consider to be robust conclusions regarding the lessons learned from the empirical work in the Viner-Meade framework. First, such agreements are generally good for the member countries and not seriously detrimental to non-members, but global (multilateral) liberalization would always be better. Secondly, the potential benefits of trade liberalization in general, and regional FTAs in particular, tend to be rather small as shares of national product. The latter is due in part because the HOS framework does not take into account dynamic factors beyond the efficiency gains from reallocating resources according to comparative advantage. Even these findings need to be treated with some caution however, and the economic structures of the countries that engage in regional integration arrangements considered. Venables (2003), for instance, argues that countries with what he calls “extreme” comparative advantage (that is, specialization in few commodities only) have much less to gain from integration than countries that can specialize in a broader range of commodities. Under such conditions, forms of south-south integration may not be beneficial for poorer countries as it may draw, for instance, much of manufacturing production to the already more developed and diversified economy that is part of the agreement. For such agreements to work out more equitably among its members, trade integration measures would have to be complemented with industry and other production sector development policies to strengthen economic integration at the national level.

The “new trade theory” does account for some of those forces (knowledge spill-over effects through trade, imperfect competition, rent-seeking behaviour, etc.), though related empirical work is based on more eclectic and less coherent frameworks. It is not surprising, therefore, that the empirical testing of the relationship between trade and economic growth has stirred some controversy and has given far from conclusive results (see, e.g., Rodriguez and Rodrik, 1999; Baldwin, 2003; Burfisher, et al., 2004; United Nations, 2006; Rodriguez, 2007).

Coe, Helpman, and Hoffmaister (1997), for instance, estimated trade-productivity links for 77 developing countries, finding sizable spillover benefits of research and development in developing countries through exports of machinery and equipment to developed countries. They estimated that a one per cent increase in the import share of machinery and equipment to GDP results in a 0.3 per cent increase in total factor productivity (TFP). Frankel and Romer (1999) analyzed a 98-country sample, controlling for capital inputs per worker and schooling. They found that a one-percentage point increase in the trade share of GDP increased the contribution of productivity to output by about two-percentage points. But these are based on aggregate growth equation, overlooking that much of productivity shifts in developing countries stem from structural changes as economies move, in differing degrees, from low- to high-productivity sectors, rather than “pushing the production technology frontier”, as assumed in the new endogenous growth literature (see United Nations 2006 for such a commentary).

The empirical evidence on the role of trade or openness per se in stimulating growth is also surrounded by some controversy. Rodriguez and Rodrik (1999),² for example, argue that the positive links between openness and income growth are greatly overstated and that the empirical work is suspect given the mixed quality of the data and problems related to measurement and empirical methodology. Furthermore, most of the trade externalities are based on macro relationships between measures of openness and measures of income or productivity growth. Instead of openness and trade expansion, Rodrik, et al. (2004) argue for the primacy of institutions in explaining economic growth. They find that the effect of trade on income, after controlling for institutions and geography, is almost always insignificant, although it is positively related to effective institutions.

Trade reforms in general, and FTAs in particular, are often seen as vehicles to introduce additional reforms that make the investment environment more appealing to attract FDI from developed countries through which there may potentially be a transfer of global technology and increased productivity. Waldkirch (2006) shows that foreign investment is also subject to sovereign risk and FTAs may serve as a commitment mechanism in order to achieve higher sustainable levels of FDI. Raff (2004) even argues that FTAs affect the location of FDI since governments may adjust taxes and external tariffs to compete for FDI – whether this raises or lowers welfare is shown to depend on the relative size of the efficiency gain from integration and the revenue loss associated with tax competition. These findings reiterate the point that the welfare gains from trade and attraction of FDI through FTAs are context-specific, as well as that the gains are likely stronger for economies that already have more integrated domestic economies to begin with.

Finally, the old trade theory focuses on efficiency gains through trade by concentrating on comparative advantage. However, natural resource-abundant economies, for instance, have been found to have systematically lower long-term growth rates for a variety of trade and non-trade related mechanisms (see, for example, Murshed, 2006 for a review). Low-income developing countries often have both a relative abundance

2 See also Rodriguez (2007) for a further discussion, including a rebuttal of the critiques on the original Rodriguez-Rodrik paper.

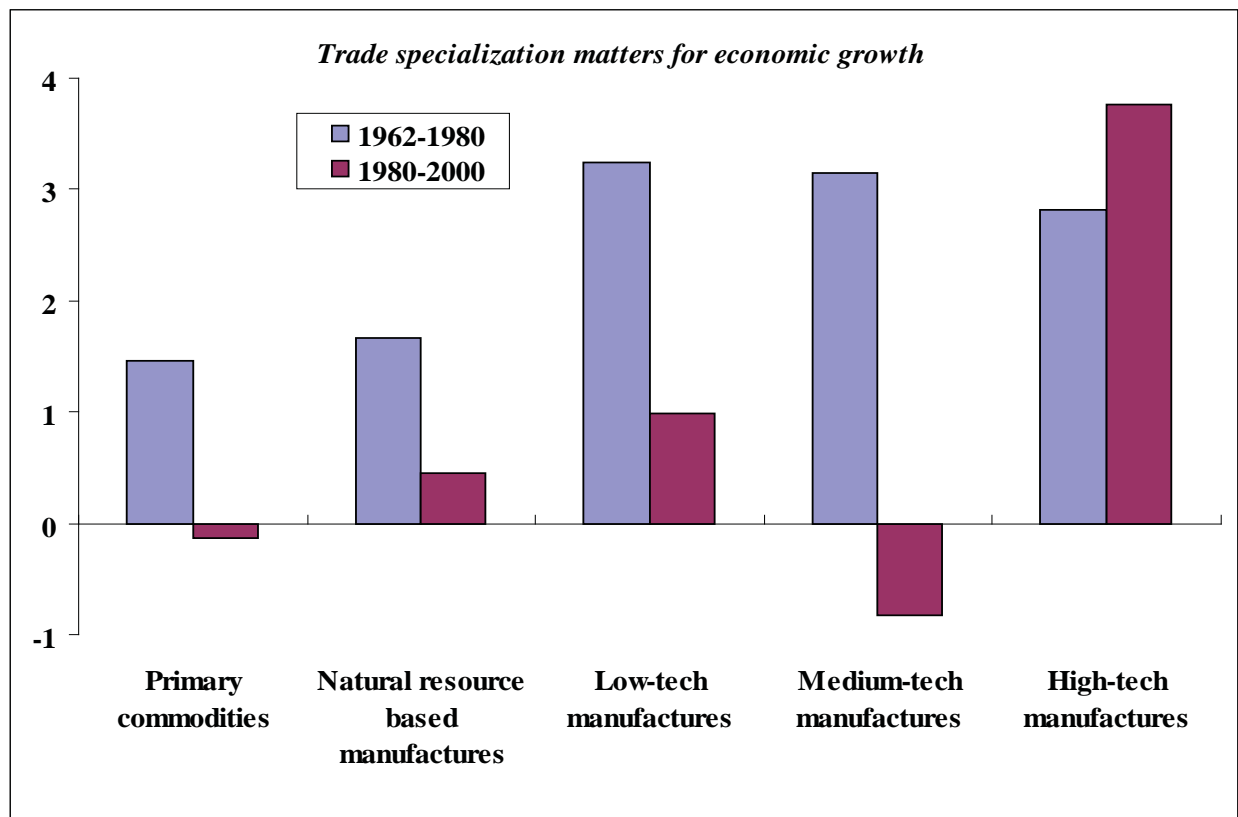
of labour and natural resources, but foremost remain specialized in one abundant factor in general: primary exports, or some others have moved towards both comparative advantages combining primary exports with labour-intensive maquila type exports, as has been the case in several African and the Central American countries, for instance. Both types of specialization share the same weaknesses when put in a broader comparative perspective: trade dependence on activities with weak integration with the rest of the economy, low levels of technological sophistication in production (hence low-knowledge spillovers) and vulnerability to rather high volatility in the corresponding commodity markets. As analyzed in the United Nations World Economic and Social Survey of 2006, such weaknesses are associated with substantially lower long-term per capita growth rates as compared to countries with stronger domestic linkages and which have diversified into export commodities with higher technology content (United Nations 2006).³ Figure 1 highlights the latter aspect. Hence, it matters what you export, likely more so than how much you trade.

Trade liberalization and poverty

The link between trade and poverty reduction would depend in the first place on the implications for income levels and economic growth, which have been a major concern of empirical studies of the welfare implica-

Figure 1.

Per capita GDP growth (y-axis) relative to dominant pattern of trade specialization, 105 developing countries, 1962-2000



Source: United Nations (2006).

3 Sánchez and Vos (2007) confirm this, showing more sustainable gains from freer trade in Costa Rica than in Nicaragua in a comparative analysis of the likely effects on these two countries of the free trade agreement between the United States and the Central American countries and the Dominican Republic (DR-CAFTA).

tions of trade reforms. However, the poverty implications will further depend on whether trade policies will also change the distribution of income. Again here we have some clear theoretical notions, but all are very sensitive to the key assumptions made.

Policy views stressing the output gains from trade (and through those, positive implications for poverty reduction) basically stem from supply-side arguments. The purpose of trade reform is to switch production away from non-tradables and inefficient import substitutes toward exportables in which countries have a comparative advantage. Presumed full employment of all resources—labour included—permits such a switch to be made painlessly. Standard trade theory based on the Heckscher-Ohlin model and Stolper-Samuelson theorem (HOS) would predict, further, that workers in developing countries would benefit from freer trade, because this would lead such nations to specialize in types of production that make more intensive use of the most abundant factor, which would presumably be (unskilled) labour. Under the given assumptions, this should be conducive to greater income equality.

Empirical research on the link between trade liberalization and wage inequality in developing countries has produced mixed results. Evidence for East Asia indicates an improvement in income equality after a strong export-led strategy was introduced in the 1960s and 1970s. In line with this view, Wood (1994, 1997) has found evidence of rising demand for unskilled labour and a decline in wage inequality in the Republic of Korea, Taiwan (China), and Singapore following trade liberalization. More recent evidence for China, however, gives an indication of widening wage inequality, however, especially across regions and between urban and rural sectors. Further, despite its very high growth rates (almost 10 per cent per annum since 1990), employment growth has been just over 1 per cent per annum when looking at official labour statistics. This reflects, of course, very strong labour productivity growth through structural change, but not all of that comes on account of trade opening, as a lot of job shedding has resulted from public enterprise reforms.

In Latin America, in contrast to the first Asian tigers, the opening of domestic markets to external competition in Latin America is mostly associated with greater wage inequality (Berry, 1998; Beyer, Rojas, and Vergara, 1999; Cragg and Epelbaum, 1996; Feenstra and Hanson, 1997; Hanson and Harrison, 1999; Ocampo and Taylor, 1998; Robbins, 1996; Robbins and Gindling, 1999; Wood, 1994, 1997; Vos and Taylor, 2002; Vos, Ganuza, Morley and Robinson, 2006). Much of the increase in wage inequality and unemployment in several countries over the last two decades has been attributed to the change in the structure of labour demand in favour of skilled workers. This is reflected in the overall increase in the return to education for skilled labour and, in some countries, in the rise of unemployment among less-skilled individuals (Freeman, 1995; Gottschalk and Smeeding, 1997). Márquez and Pages (1997) estimated labour demand models with panel data for 18 Latin American countries and found that trade reforms had a negative effect on employment growth. Meanwhile, Currie and Harrison (1997), Revenga (1997), and Ros and Bouillón (2002) have analyzed the cases of Morocco and Mexico, respectively, and found that reductions in tariff levels and import quotas have had a modest but negative impact on employment, which has partly been the result of firms' efforts to cut margins and raise productivity.

This apparent contrast between experiences could suggest that the issue is an empirical matter rather than a theoretical puzzle. Economists, however, do not agree on the causes of the change in the structure of labour demand. The controversy is based mainly on the HOS model and interpretations of the recent wave of technological innovations, which has had strong impacts on the structure of labour demand. Because developing countries tend to have abundant unskilled labour, the increasing inequality is puzzling. Accord-

ing to the HOS model, developing countries should specialize in the production of goods that are intensive in unskilled labour, thus increasing the relative demand for this factor and reducing wage differentials. The question has been raised, however, as to whether the empirical evidence of rising inequality is sufficient to challenge the relevance of the Stolper-Samuelson theorem, because Latin America's comparative advantage may not be to specialize in labour and low-skill-intensive production. This possibility has been brought up not only because of Latin America's abundant endowment of natural resources, but also because the predominance of low-skilled workers (say, with fewer than nine years of education) is probably less marked in the region's labour force than in much of Asia and Africa. These conditions will change the expected outcomes of trade liberalization. Latin America's abundant endowment of land (relative to labour) and its unequal distribution has been shown to drive up income inequality following trade liberalization. Other factors, such as China's growing presence in world markets, for instance, may also depress wage improvements in Latin America's export sectors (De Ferranti, et al., 2002; Wood, 1994). These conditions are probably only part of the explanation for rising inequality following trade liberalization. An alternative hypothesis suggests that the recent opening to trade observed in various developing countries may have unleashed a simultaneous process of technological modernization and an increase in capital stock that have had a positive impact on the demand for skilled labour. These developments would then drive up the returns to human capital and intensify the dispersion of wages.

Although trade reforms may have important supply-side effects, aggregate demand also has an impact on growth and distribution, just as capital inflows have an impact on relative prices. The old import-substitution model relied on the expansion of internal markets with rising real wages as part of its strategy. Under the new, more open trade regime, the question of controlling wage costs has taken centre stage. As long as there is enough productivity growth and no substantial displacement of workers, wage restraints need not be a problem because the expansion of output can create room for the growth of employment and real incomes. But if wage levels are seriously reduced and/or workers with high consumption propensities lose their jobs, then the resulting contraction of domestic demand could cut labour income in sectors that produce for the domestic market. Income inequality could then rise if displaced unskilled workers end up in informal services for which there is a declining demand. Larger inflows of capital following liberalization tend to lead to real exchange-rate appreciation, which can offset liberalization's incentives for the production of traded goods and force greater reductions in real wage costs. On the demand side, though, capital inflows may stimulate aggregate spending through increased domestic investment (either directly or through credit expansion) and lower saving (credit expansion triggering a consumption boom). Furthermore, although macroeconomic stabilization policies that use the exchange rate as a nominal anchor may exacerbate real exchange rate appreciation, inflation can be brought under control, thereby allowing a recovery of real wages. Poverty, and in particular urban poverty, may decline, because much of the short-run economic expansion will be in non-traded goods. The expansion of aggregate demand may quite likely prove to be short-lived if the consequent widening of the external balance is not sustainable and if volatility in short-term capital inflows and a lack of regulatory control put the domestic financial system at risk. However, even if a financial crisis can be avoided, the economy may be pushed onto a deflationary path. A stop in capital inflows, as happened in the late 1990s, may not trigger a strong export drive in response, if there has been an earlier erosion of competitiveness and aggregate demand, and in this case imports will have to be slashed. Morley and Vos (2006) showed that exports became the main driving force of aggregate output growth in most Latin American countries in the second half of the 1990s, even though the export sector was not very dynamic and virtually none of the economies managed to increase their penetration in world markets. For sure, this is export-led growth on a slippery path. The thrust of these observations is that the effects of balance of pay-

ments liberalization on growth, employment, and income distribution arise out of a complex set of interactions involving both the supply and the demand sides of the economy. Income redistribution, poverty and major shifts in relative prices are endogenous to the process, and there are no simple conclusions about the effects of liberalization.

Modelling issues

CGE models are by far the preferred framework of economists to assess the implications of trade liberalization, be it unilaterally, in regional agreements or multilaterally under the umbrella of the WTO. CGE models have great virtues, such as bringing together demand and supply factors, a high degree of flexibility in managing alternative degrees of sectoral detail and factor and household classifications; they have clear simulation purposes, and are quite suitable to conduct counterfactual analyses, which allow for ex-ante assessments of the potential impact of trade liberalization on affected economies. CGE models have strong theoretical foundations in neoclassical theory, but have evolved over time to capture differences in the structure and behaviour of economies, among others, by assuming different macroeconomic closure mechanisms and rigidities in commodity and factor markets. CGE analysis used to be quite an undertaking, typically a multi-year project, but standardized and widely accessible frameworks plus great advances in solving algorithms and computer programs have greatly eased the work. The numbers produced by the CGE models tend to have considerable influence in the public discourse about the effects of trade liberalization. The Global Trade Analysis Project (GTAP) provides a core trade modelling framework and database to a wide network of users and has enabled modelling of regional and global trade scenarios. The World Bank LINKAGE model shares many similarities with the GTAP framework and also uses the GTAP data base (Van der Mensbrughe, 2007). The World Bank global trade analysis is mostly based on a dynamic version of LINKAGE. The International Food Policy Research Institute (IFPRI) has developed a “standard” model which is widely used as a basis for country-level trade policy analysis. Again the static version of this model is very similar in its specification as the GTAP and LINKAGE frameworks but is flexible, among other things, in setting alternative macro closure rules.

So much similarity in these influential modelling frameworks helps the comparability of different country analyses, analyses of regional free trade agreements and alternative scenario analyses of options in multilateral trade negotiation, for instance. Yet, while drawing on similar modelling frameworks outcomes may differ substantially. Global trade models interestingly can bring out the distribution of economic gains from trade by regions and countries. However, some studies predict, for instance, that agricultural liberalization in the context of the Doha Round will lead to average income gains for sub-Saharan Africa, while others show losses (Anderson and Martin, 2006; Decreux and Fontagné, 2006; and Polaski, 2006). The sources of such qualitatively important differences are not always immediately clear and more sensitivity analysis needs to be done. Many of the possible candidates are known and could relate to different assumptions about key parameters, closure rules or other limitations to our modelling framework. Let me highlight a few by way of example.

On key parameters and trade functions: Armington specifications of trade linkages

One key feature of modelling trade linkages in the standard CGE frameworks is to use Armington specifications (Armington, 1969), which assumes imperfect substitutability between domestic products and imports (and vice versa between foreign products and exports). The related import and export functions are fully dependent on relative prices and incomes. By assuming imperfect substitutability, the Armington specifica-

tion avoids complete specialization and makes multilateral trade easy to model. The specification also forces the pass-through effects of tariffs on supply prices to be less than 100 per cent. All the mentioned CGE frameworks work with such Armington specifications. More in general, with higher Armington elasticities trade liberalization, will create more trade and accordingly higher incomes. Bouët (2006) reviewed 16 studies of global trade liberalization using global CGE frameworks showing the sensitivity of trade parameter choice. The World Bank's LINKAGE model, for instance, uses higher elasticities than those generated by the Global Trade Analysis Project (GTAP) network yielding in consequence expected benefits from multilateral trade liberalization that are 33 per cent higher.

In their critical assessment of the implications of the Armington specifications for outcomes of trade liberalization, Von Arnim and Taylor (2007) show that, because of the Armington assumption, tariff cuts may reduce consumption, rather than enhancing it. One would expect consumption to increase because domestic import prices will fall with the tariff cut. However, when applying particular macro closures, one could obtain the opposite effect. If the fiscal deficit is assumed to be fixed, then a tariff reduction must be offset by higher income taxes which will induce a drop in private consumption. Van Arnim and Taylor, subsequently show that the higher the Armington elasticity of substitution, the lower the consumption crunch. Figure 2 shows this interaction of fiscal policies and liberalization under different values for the Armington elasticity under a scenario of full global trade liberalization and a simplified, two-region version of the LINKAGE model as constructed by Van Arnim and Taylor. The implications for the assessment of the welfare gains thus critically depend on the closure rule used for the fiscal balance as much as the value of the Armington elasticity. In Africa's case it could make a world of difference what parameter values were chosen.

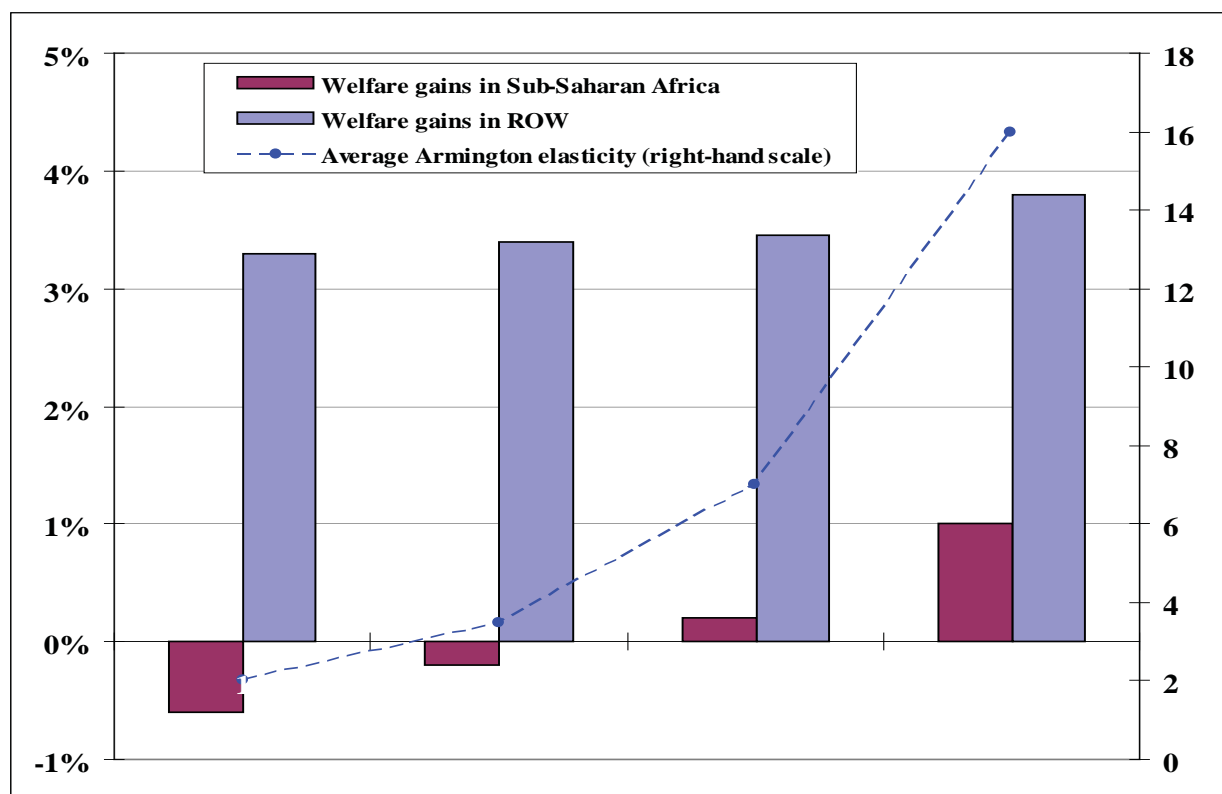
As such, this finding need not be too worrisome as one could run scenarios under alternative fiscal policy rules and Armington elasticities may be estimated for the specific context being analyzed. The problem in many practical applications is, however, that alternative closure rules are not being tested in conjunction with alternative elasticity values and Armington elasticities are often borrowed "from elsewhere" rather than estimated. The "elsewhere" is not always clear. The Armington elasticities mostly used in the LINKAGE, but also in GTAP applications are typically rather high. If these are indeed "too high", as some critics argue, than the welfare gains from trade liberalization may well be overestimated and the same will apply to all those who "borrow" such elasticities conveniently from these models. However, higher trade elasticities also ease the adjustment in trade balances and hence require less adjustment in other macroeconomic variables, such as the exchange rate, with further implications of such assumptions.

In fact, the possible effects depend not only on the value of the Armington elasticity and fiscal closure rule, but also on the size of the tariff cuts. In a recent country-based CGE study I conducted with Marco Sánchez on the welfare and poverty implications of DR-CAFTA in Nicaragua, the consumption compressing effects of a higher Armington elasticity within a reasonable bound were not found to be very strong (Sánchez and Vos, 2006). In line with Van Arnim and Taylor's argument, though, when assuming a flexible government closure (and fixed tax rates) the simulated welfare gains were slightly larger. In a similar study for Costa Rica though, Sánchez (2007) shows that even with rather low Armington elasticities and a flexible fiscal closure, there is no consumption compressing effect, essentially because the size of the tariff cuts is small.

In global trade models, the Armington effect may be more important in terms of the implications for the terms of trade. I will discuss this also further below, but a recent paper by Van der Mensbrugge (2007), brings out some sensitivities of the Armington specification for the terms of trade in the context of the LINKAGE model. Countries can gain market shares through price reduction and to the extent your

Figure 2

Welfare changes relative to GDP: Full liberalization in the World Bank's closure with different Armington elasticities



Source: Van Arnim and Taylor (2007: Figure 5)

trading partners have relatively lower tariffs, your country will have to adjust export prices downward more strongly. A higher Armington elasticity can attenuate such terms-of-trade effects, because it would define greater demand responsiveness. Simulations of the welfare gains and losses of an agreement in the Doha negotiations under the “standard” assumptions of LINKAGE (see below) would lead to terms-of-trade losses for developing countries, especially those in sub-Saharan Africa. Hence differences in assumptions about Armington elasticities may well explain the differences in the degree of terms-of-trade losses and in the conclusion as to whether African countries stand to gain from the Doha Round or not.

Labour market assumptions

Equally alternative assumptions for the labour market adjustment could yield quite different results for the welfare and poverty outcomes. In a response to some critics, Dominique van der Mensbrugghe (2007) analyzed the possible welfare implications of a potential Doha Round accord by running the World Bank's LINKAGE model under different labour market closure rules. In the standard closure rule, applied in much of the World Bank's global trade analyses, wages are uniform across sectors and labour is perfectly mobile and fully employed. These are basic neoclassical assumptions, but can hardly be called realistic for any context. Under these labour market assumptions, the World Bank finds net positive global welfare gains from the Doha trade liberalization, with most of the gains accruing to the high-income countries in absolute terms, but the developing countries gaining equally in relative terms (see Figures 3a and 3b). South Asia, but also part of sub-Saharan Africa, would lose under this scenario, especially due to terms-of-trade losses (affecting all developing countries, but these regions more). Terms-of-trade losses may, as mentioned, in part be attributed to the Armington assumption.

The alternative labour market closures relax the assumption of a uniform wage and assume there is a gap in the wages for agricultural and non-agricultural workers. In the first alternative such a gap exists in all economies. This may have productivity implications as workers can move from low to high-productivity sectors or vice versa. As a result, trade liberalization pushes up overall welfare gains, but on average developing countries would be less well off, as in those countries greater specialization on primary, agricultural products would shift labour demand to the lower productivity sectors inducing an overall negative productivity effect, especially in Africa and South America (see, once again, figures 3a and 3b). If in addition the assumption of full employment is dropped for urban workers in developing countries and the agricultural-non-agricultural wage gap only applies for developing countries, those countries stand to gain more from the Doha round, but the gains are greater in developing countries with a comparative advantage in manufacturing and services (with generally higher productivity, compounded by gains through the use of slack capacity, i.e. lower unemployment, in the economy).

Labour market closure rules will, of course, also matter for distributional and poverty outcomes. If markets are segmented and labour is not fully mobile across sectors or labour categories, wage gaps will emerge. If wage rigidities exist, adjustment will fall on employment. The effects on wage inequality and employment may well offset each other. In a study covering 16 Latin American countries which I coordinated for UNDP a few years ago (see Vos, Ganuza, Morley and Robinson, 2006), we found that trade liberalization either unilaterally or multilaterally) generally gave rise to positive employment effects, but rising wage inequality, especially between skilled and unskilled workers. At the household level, however, the combination of these two effects would lead to little change in inequality of per capita incomes and some slight poverty reduction. Running the (static) CGE models under alternative labour market closure rules suggested that the initial economic structure was the main factor in explaining differences in that average finding. Inequality effects would be stronger in the countries with more heavy reliance on (few) primary exports (such as in Bolivia, Ecuador, Peru and Venezuela) and in some of these cases these would outweigh the positive employment effects leading to poverty increases because of trade liberalization.

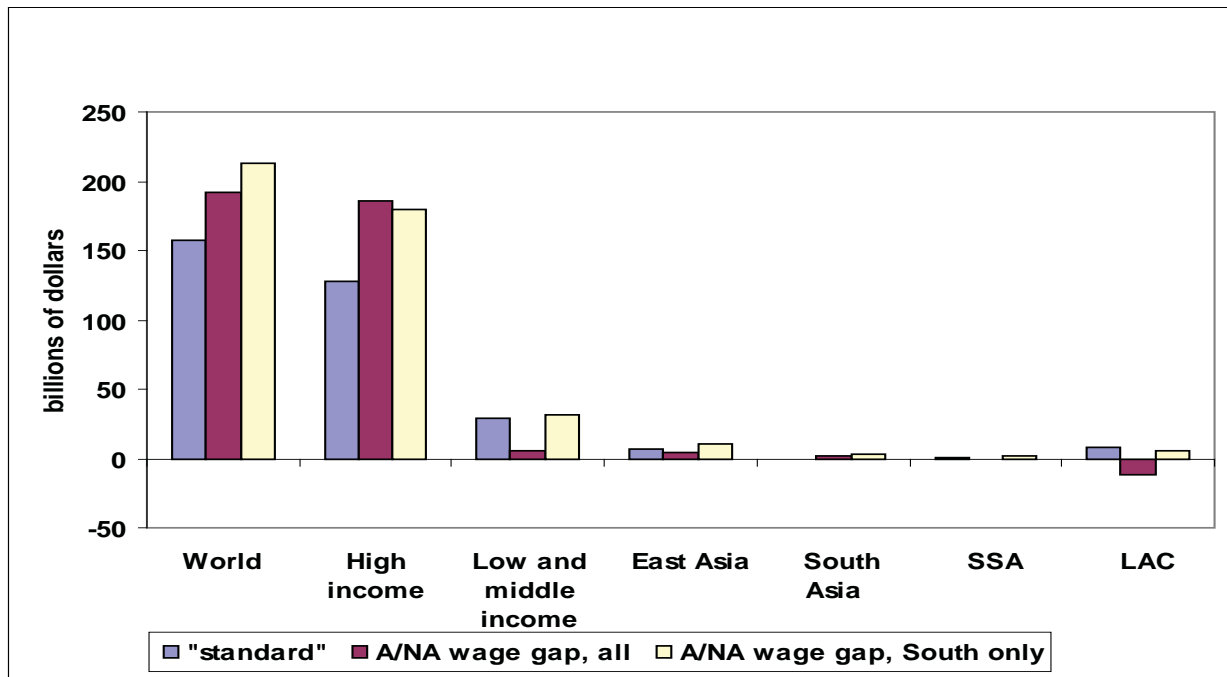
Macro closure rules

The implications of alternative macro closure rules on the outcomes of trade policy analysis are well known.⁴ I will not go into detail here, but by way of example, let me focus on the role of the external closure. In CGE analysis typically two alternative external closures are considered: one can either assume that the trade balance is fixed and the real exchange rate adjusts to equilibrate aggregate exports and imports or that the real exchange rate is fixed and the trade balance is endogenous. In the type of CGE frameworks indicated above one should expect that trade liberalization will shift relative prices in favour of tradables and if the tradable goods sector has a higher average productivity and labour-intensity than non-traded activities, this should lead to an expansion of aggregate output and employment along the lines of the dependent-economy model. The expansionary effect may be compounded, in the short run, by reduced import cost and a larger influx of foreign capital to finance a rising trade deficit if import demand responds more strongly than exports to trade opening. Thus, if the given conditions hold, we would expect a stronger expansionary effect of trade liberalization under a fixed-exchange rate regime, as in this case expanding domestic demand and a widening external balance will not hit a foreign exchange constraint. The ensuing real exchange rate appreciation depresses the positive impact on exports and traded-goods output, but if trade elasticities are relatively low (which typically holds in particular for primary exporters) the foreign capital impulse and expansion of non-

⁴ See, for example, Sen (1963), Taylor (1983, 1990), Rattsø (1982), Robinson (1989, 1991, 2003), and Dewatripont and Michel (1987).

Figure 3a.

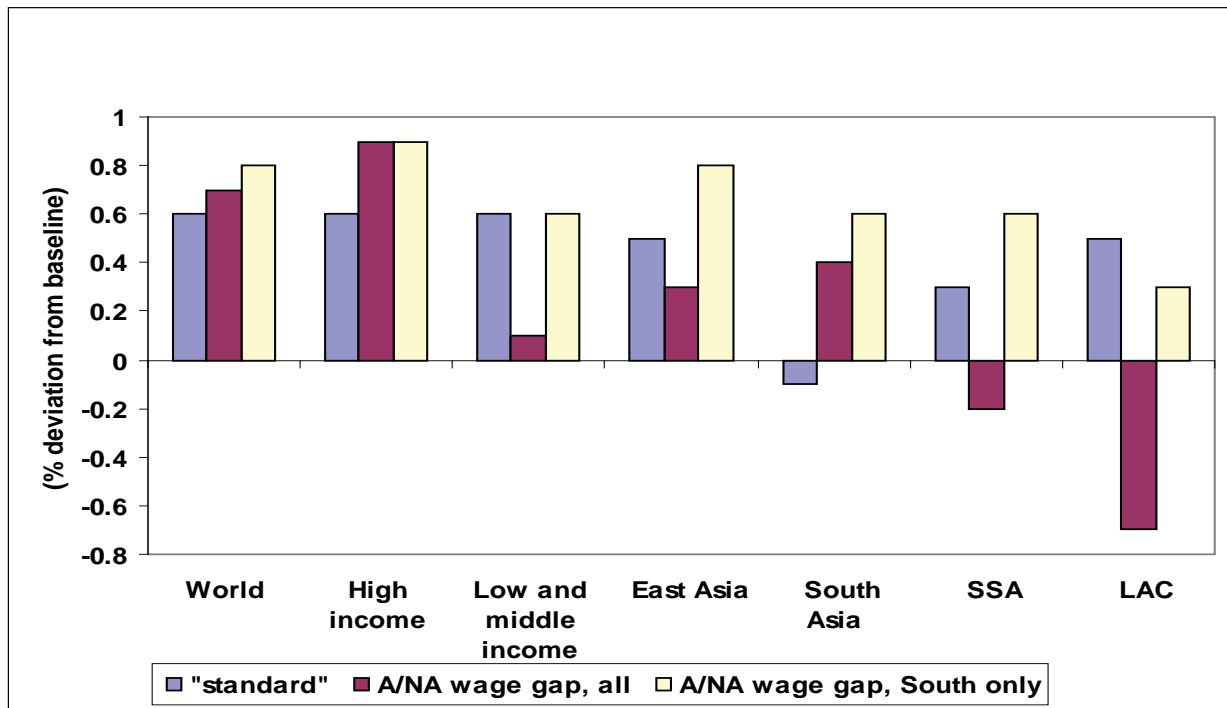
LINKAGE model simulation of Doha Round, real income effects (in bln \$) under alternative labour market closures



Source: Van der Mensbrugge (2007).

Figure 3b.

LINKAGE model simulation of Doha Round, real income effects (% deviation) under alternative labour market closures



Source: Van der Mensbrugge (2007).

traded goods tend to outweigh the effects on export production. For similar reasons, devaluations tend to be contractionary. Under a flexible exchange-rate regime, the real exchange rate depreciates to accommodate a rising trade deficit triggered by import liberalization while the level of foreign savings is kept fixed. The expected result would now be a strengthening of the export drive and tradable goods output and employment, but more restricted aggregate demand growth as access to external borrowing is restricted. In the study on trade liberalization in Latin America, to which I just referred to in the above (see Vos, Ganuza, Morley and Robinson, 2006), we found such effects to be present in most cases. Because of the stronger real wage and employment effects, poverty reduction effects would be somewhat stronger as well (or poverty increases less).

Many real trade models tend to assume a flexible exchange rate for the external closure, but many countries retain managed or fixed exchange-rate regimes. As indicated, the implications of this assumption are not trivial. Also the flexible exchange-rate closure assumes that foreign savings are fixed, hence ignoring a role for foreign financing in the adjustment process to trade opening. In contrast, under a fixed exchange rate, foreign savings would accommodate any ensuing trade imbalance. This again may be unrealistic over time as countries running trade deficits cannot infinitely borrow abroad. Trade models, typically do not impose any restrictions that may emerge from debt sustainability problems or speculative capital movements and hence may ignore macroeconomic adjustment effects referred to earlier.

Dynamics

Dynamic CGE models are increasingly being applied in general equilibrium analysis of trade reforms. However, in most cases the dynamics is rather rudimentary. Typically, a recursive framework is used to drive 'dynamics' in the form of updating stock variables, especially of capital and labour. The LINKAGE, GTAP and IFPRI frameworks often assume, in addition, that total factor productivity growth is endogenous, responding to trade openness. The latter assumption is admittedly ad hoc and not uncontested empirically, as discussed earlier. Also, and perhaps even more importantly, these CGE frameworks deal poorly with imperfect competition, as much as they are unable to handle activities shifting towards product differentiation or the introduction of entirely new activities; this may well be part of dynamic and diversification responses to trade integration. More in general, while the insights from new trade theory are gradually being incorporated in some CGE applications, the more widely used model frameworks, and especially those most influential in the policy debate, are at quite some distance from fully incorporating such insights.

Transitional problems and volatility

Most studies (and model frameworks) focus on income and (un)employment effects of trade liberalization rather than on the volatility of labour markets or transitional problems caused by structural changes in the economy. Jansen and Lee (2007) provide a review of studies which show that job insecurity has risen during periods of trade liberalization, though trade opening may not be the only factor in driving up job insecurity and frictional unemployment. In the CGE frameworks, labour shifts across activities are typically assumed to be instantaneous and painless. In practice, however, such adjustments have dramatic job and income implications for groups of workers. Social and active employment policies (for example, cash transfers, emergency employment programmes, retraining programmes) could attenuate such costs of course, but the effectiveness and costs of such policies typically are not part of the assessments of the welfare implications of trade reform.

Poverty analysis

Finally, the CGE frameworks have problems in adequately capturing poverty effects. One major reason is that they incorporate rather aggregate, representative household groups and labour categories. Distributional

effects thus are limited to the between-group income distribution of those categories. Important, within-group distributional detail thus tends to be missing to make appropriate assessments of the implications for income poverty. Some CGE model frameworks (references) include distribution functions to capture such effects, but these may miss out important aspects as well, since trade liberalization is expected to induce structural change and shifts in the composition of labour demand and hence such distribution functions cannot be expected to be stable. Hence, assuming given distribution functions may still beg the question regarding the distributive effects either. For instance, if trade opening leads to less unemployment it may matter who in the overall distribution will find a job; similarly, if higher productivity sectors demand more workers, a question to be answered is which workers are most likely to move to such sectors. This will require more detailed modelling efforts. A recent trend is to do so outside of the CGE framework through a variety of microsimulation methods, which I will not discuss here.⁵ The merits of each of these methods is still to be tested, since – as far as I am aware of – very little work has been done in comparing such methods to see whether using one or the other would influence the simulated poverty effects from trade liberalization.

Conclusions

Getting back to the initial question: what do we know about the links between trade, income and poverty? From the overview of issues I have given, as incomplete as they are, I should take distance from the quote from Socrates. In fact, we do know a lot and the wide array of studies has given us much more insight into those links. Also, much of the sometimes conflicting evidence can be brought back to specific assumptions, differences in methods and limitations in the data. Policy makers may not wish to be burdened by such complications, but probably they should, before running away with findings which do not stand the test of minimal robustness. The mentioned analytical and modelling problems may sound trivial and maybe they are. Unfortunately, however, analysts – and this may include all of us – do not always take these sufficiently to heart and make sufficient and relentless efforts to justify assumptions against reality (rather than just make assumptions) and test for the sensitivity of the outcomes to alternative assumptions, specifications or methodological approaches. As obvious as this may seem, too little of this comes to the fore in the literature, especially where it comes to the interpretation for policy makers.

Having said this and at the risk of gross overgeneralization, my reading of the evidence on the growth and poverty effects of trade liberalization gives rise to the following answers as to what we know about this:

- More trade and thus trade opening on balance tends to generate positive aggregate income effects, but clearly not all countries and groups within countries benefit to the same degree and some stand to lose.
- Employment, distribution and poverty effects show more mixed evidence, depending on the country case, especially on the initial production structure and options for finding new “specializations” and on the functioning of the labour market (or the assumptions made about these).
- Even if these effects are positive they tend to be relatively small, especially when looking ahead at new trade agreements. This is so, in part, because trade liberalization has already progressed over the past decades and additional trade opening may affect certain sectors or groups to some extent, but the effects on the overall economy tend to be small. Small welfare gains also result because of the unrealistic assumption of full employment, which – unfortunately – is still being

5 Bourguignon, *et al.* (2002), Ganuza, Paes de Barros, and Vos (2002) and Vos, Ganuza, Morley and Robinson (2006) offer a discussion and application of such methods in conjunction with CGE model analysis.

applied in most CGE analyses. It may also be due to our relative ignorance about the dynamic gains from trade in practice. If they are considered at all, the underlying mechanisms tend to be treated in rather ad hoc ways and existing evidence is fiercely contested. The assumptions made about the dynamic productivity effects have a major bearing as to whether there will be any tangible growth effects or not. The optimistic findings from LINKAGE model, for instance, suggest that the Doha Round would generate less than a one per cent increase in the average world income level and some countries (either in the static or dynamic versions of the model) could increase average incomes to up to around 4 per cent at best. Such average income gains spread over a number of years translate, of course, into almost negligible increases in the growth rate of the economy.

- We have further learned that if you want to grow faster (and probably have more poverty reduction), it matters more what you export and how diversified your exports are than how much you trade. This calls for more active industrial and other production sector development policies to accompany (or even precede) trade liberalization.
- Having said all this, it is also clear that trade liberalization is no panacea for poverty reduction. Average welfare gains are mostly small and in many instances has been inequality enhancing. Across countries, most of the absolute gains would accrue to the developed countries. Developing countries gain or lose, depending on their trade structures and, to a large extent, on the terms of trade effects originating from trade liberalization. At the country level, mixed, but generally small poverty effects have been reported. As indicated, however, in many cases we cannot be entirely sure whether these would be true outcomes or “figments of our imagination”, especially where there are serious doubts about the degree of realism of the assumptions made in our model frameworks.

So we know much more than “nothing”, but we need to look critically at the frameworks we use and work much harder to improve these if we want to better guide the debate on trade policies which is still stirring lots of controversy.

References

- Anderson, Kym, and Will Martin (2006), *Agricultural Trade Reform and the Doha Development Agenda*, New York and Washington D.C.: Palgrave Macmillan and the World Bank.
- Armington, Paul S. (1969) "A Theory of Demand for Products Distinguished by Place of Production," *IMF Staff Papers*, 16: 159-178.
- Baldwin, Robert E. (2003) "Openness and Growth: What's the Empirical Relationship?", National Bureau of Economic Research Working Paper No. 9578.
- Berry, Albert (ed.) (1998) *Poverty, Economic Reform, and Income Distribution in Latin America*, London: Lynne Rienner.
- Beyer, Harald, Patricio Rojas, and Rodrigo Vergara. 1999. "Trade Liberalization and Wage Inequality." *Journal of Development Economics* 59 (1): 103-23.
- Bouët, Antoine (2006) "What can the poor expect from trade liberalization? Opening the 'black box' of trade modelling", MTID Discussion Paper No. 93, Washington D.C.: International Food and Policy Research Institute (IFPRI).
- Bourguignon, François, Anne-Sophie Robilliard and Sherman Robinson (2002) "Representative versus real households in the macro-economic modeling of inequality". Washington, D.C.: World Bank and International Food Policy Research Institute (mimeo).
- Burfisher, Mary E., Sherman Robinson and Karen Thierfelder (2004) "Regionalism: Old and New, Theory and Practice", in: G. Anania (ed), *Agricultural Policy Reform and the WTO: Where Are We Heading?*, Cheltenham, U.K. and Northampton, Mass.: Elgar, pp. 593-622.
- Coe, D. T., E. Helpman and A. Hoffmaister (1997), "North-South R&D and Spillovers", *Economic Journal*. Vol. 107, No. 440: 134-49.
- Cragg, Michael I., and Mario Epelbaum (1996) "Why Has Wage Dispersion Grown in Mexico? Is It the Incidence of Reforms or the Growing Demand for Skills?" *Journal of Development Economics* 51 (1): 99-116.
- Currie, Janet, and Ann Harrison (1997) "Sharing Costs: The Impact of Trade Reform on Capital and Labor in Morocco." *Journal of Labor Economics* 15 (3): S44-S72.
- Decreux, Yvan, and Lionel Fontagné (2006), "A Quantitative Assessment of the Outcome of the Doha Development Agenda", working Papers 2006-10, CEPII Research Centre, Paris.
- De Ferranti, David, Guillermo Perry, Daniel Lederman, and William F. Maloney (2002), *From Natural Resources to the Knowledge Economy: Trade and Job Quality*. Washington, DC: World Bank.
- Dewatripont, M. and G. Michel (1987) 'On closure rules, homogeneity, and dynamics in applied general equilibrium models', *Journal of Development Economics*, 26 (1): 65-76.
- Feenstra, Robert C., and Gordon H. Hanson (1997), "Foreign Direct Investments and Relative Wages: Evidence from Mexico's Maquiladoras." *Journal of International Economics* 42 (3/4): 371-93.
- Frankel, J.A. and D. Romer (1999), "Does Trade Cause Growth?", *The American Economic Review*. Vol. 89, No. 3, pp: 379-99.
- Freeman, Richard B. (1995) "Are Your Wages Set in Beijing?" *Journal of Economic Perspectives* 9 (3): 15-32.
- Ganuza, Enrique, Ricardo Paes de Barros, and Rob Vos (2002) 'Labour Market Adjustment, Poverty and Inequality during Liberalization', in: Rob Vos, Lance Taylor and Ricardo Paes de Barros, R. (eds.) *Economic Liberalization, Distribution and Poverty: Latin America in the 1990s*, Cheltenham (UK) and Northampton (US): Edward Elgar Publishers, pp. 54-88.
- Gottschalk, Peter, and Timothy M. Smeeding (1997). "Cross-National Comparisons of Earnings and Income Inequality." *Journal of Economic Literature* 35 (2): 633-87.
- Hanson, Gordon, and Ann Harrison (1999), "Trade, Technology and Wage Inequality." *Industrial and Labor Relations Review* 52 (2): 271-88.
- Jansen, Marion and Eddy Lee (2007) *Trade and employment: Challenges for policy research*, Geneva: ILO and WTO.
- Löfgren, Hans, Rebecca Lee and Sherman Robinson (2002) "A standard computable general equilibrium (CGE) model in GAMS", Microcomputers in Policy Research 5. Washington, D. C.: International Food Policy Research Institute.
- Márquez, Gustavo and Carmen Pages (1997) "Trade and Employment: Evidence from Latin America and the Caribbean." Unpublished paper. Washington, DC, Inter-American Development Bank.
- Morley, Samuel and Rob Vos (2006) "Bad luck or wrong policies? External shocks, domestic adjustment and growth slowdown in Latin America and the Caribbean", in: Vos, Rob, Enrique Ganuza, Samuel Morley and Sherman Robinson (eds.) (2006) *Who Gains from Free Trade? Export-led Growth, Inequality and Poverty in Latin America*, London and New York: Routledge, pp. 8-54.

- Murshed, S. Mansoob (2004), When does natural resource abundance lead to a resource curse?, IIED-EEP working paper 04–01. International Institute for Environment and Development, London. <http://www.iied.org>.
- Ocampo, José Antonio and Lance Taylor (1998), “Trade Liberalization in Developing Economies: Modest Benefits But Problems with Productivity Growth, Macro Prices and Income Distribution.” *Economic Journal* 108 (8): 1523–46.
- Polaski, S. (2006), ‘Winners and Losers: Impact of the Doha Round on Developing Countries’, Carnegie Endowment for International Peace, Washington D.C.
- Raff, Horst (2004) “Preferential Trade Agreements and Tax Competition for Foreign Direct Investment”, *Journal of Public Economics*, 88(12): 2745-63.
- Rattsø, Jørn (1982) ‘Different macroclosures of the original Johansen model and their impact on policy evaluation’, *Journal of Policy Modeling* 4 (1): 85-97.
- Reventa, Ana (1997) “Employment and Wage Effects of Trade Liberalization: The Case of Mexican Manufacturing.” *Journal of Labor Economics* 15 (3): S20–S43.
- Robbins, Donald J. (1996) “HOS Hits Facts: Facts Win; Evidence on Trade and Wages in the Developing Countries.” Development Discussion Paper 557, Harvard Institute for International Development, Cambridge, MA.
- Robbins, Donald J., and Thomas H. Gindling (1999) “Trade Liberalization and the Relative Wages for More-Skilled Workers in Costa Rica.” *Review of Development Economics* 3 (2): 140–54.
- Robinson, Sherman (1989), ‘Multisectoral Models’, in: H. Chenery and T.N. Srinivasan (eds.), *Handbook of Development Economics. Volume 2*, Amsterdam: North-Holland, pp. 886-947.
- Robinson, Sherman (1991), ‘Macroeconomics, financial variables, and computable general equilibrium models’, *World Development*, 19 (11): 1509-1525.
- Robinson, Sherman (2003) ‘Macro Models and SAM Multipliers: Leontief, Stone, Keynes and CGE Models’, Paper presented at Conference ‘Poverty, Inequality and Development’ in Honor of Erik Thorbecke, Ithaca: Cornell University (October).
- Rodriguez, Francisco (2007), “Openness and growth: what have we learned?”, in: José Antonio Ocampo, Jomo K.S. and Rob Vos (eds.), *Growth Divergences. Explaining Differences in Economic Performance*, New York, London, Hyderabad and Penang: Orient Longman, Zed Books and Third World Network, pp. 172-203.
- Rodriguez, Francisco and Dani Rodrik (1999) ‘Trade Policy and Economic Growth: A Skeptic’s Guide to Cross-National Evidence’, NBER Working Paper No. 7081, Cambridge (MA): National Bureau of Economic Research.
- Rodrik, Dani, Arvind Subramanian, and Francesco Trebbi (2004), ‘Institutions rule: The primacy of institutions over geography and integration in economic development’, *Journal of Economic Growth* 9 (2): 131–165.
- Ros, Jaime, and César Bouillon (2002) “Mexico: Trade Liberalization, Growth, Inequality and Poverty,” in: Rob Vos, Lance Taylor, and Ricardo Paes de Barros (eds), *Economic Liberalization, Distribution and Poverty: Latin America in the 1990s*, Cheltenham, UK: Edward Elgar, pp. 347–89.
- Sánchez, Marco V. (2007) “Liberalización comercial en el marco del DR-CAFTA: efectos en el crecimiento, la pobreza y la desigualdad en Costa Rica”, Serie Estudios y Perspectivas, N° 80. Mexico City: ECLAC.
- Sánchez, Marco V. and Rob Vos (2006) “DR-CAFTA: Panacea o fatalidad para el desarrollo económico y social en Nicaragua”, Serie Estudios y Perspectivas, N° 57. Mexico City: ECLAC.
- Sen, Amartya K. (1963) ‘Neo-classical and neo-Keynesian theories of distribution’, *Economic Record* 39: 53-66.
- Taylor, Lance (1983) *Structuralist Macroeconomics. Applicable Models for the Third World*, New York: Basic Books.
- Taylor, Lance (1990) ‘Structuralist CGE Models’, in: Lance Taylor (ed.) *Socially Relevant Policy Analysis*, Cambridge (MA): MIT Press.
- Taylor, Lance and Rob Vos (2002) ‘Balance of payments liberalization in Latin America: effects on growth, distribution and poverty’, in: Rob Vos, Lance Taylor and Ricardo Paes de Barros (eds.) *Economic Liberalization, Distribution and Poverty: Latin America in the 1990s*, Cheltenham UK, Northampton, MA: Edward Elgar Publishers, pp. 1-53.
- United Nations (2006) *World Economic and Social Survey 2006: Diverging Growth and Development*, New York: United Nations.
- Van der Mensbrugge, Dominique (2007) ‘Modeling the impact of trade liberalization: a structuralist perspective?’, World Bank, Washington D.C. (mimeo, May).
- Venables, Anthony (2003) “Winners and losers from regional integration agreements”, *Economic Journal*, 130 (490): 747-761 (October).
- Von Arnim, Rudiger and Lance Taylor (2007) ‘World Bank CGE Macroeconomics and the Doha debate’, New York, New School for Economic Research (mimeo, April).

-
- Vos, Rob, Enrique Ganuza, Samuel Morley and Sherman Robinson (eds.) (2006) *Who Gains from Free Trade? Export-led Growth, Inequality and Poverty in Latin America*, London and New York: Routledge.
- Vos, Rob, Lance Taylor and Ricardo Paes de Barros (eds.) (2002) *Economic Liberalization, Distribution and Poverty: Latin America in the 1990s*, Cheltenham UK, Northampton, MA: Edward Elgar Publishers.
- Waldkirch, Andreas. (2006) "The 'New Regionalism': Integration as a Commitment Device for Developing Countries", *Journal of Economic Integration*, 21(2): 397-425.
- Wood, Adrian (1994), *North-South Trade, Employment and Inequality: Changing Fortunes in a Skill-Driven World*. Oxford, UK: Clarendon Press.
- Wood, Adrian (1997) "Openness and Wage Inequality in Developing Countries: The Latin American Challenge to East Asian Conventional Wisdom." *World Bank Economic Review* 11 (1): 33-57.

