What is the Role of Labor Markets in Making Trade Reforms Pro-Poor in Latin America

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Abstract:
Trade liberalization may be a powerful policy in the fight against poverty in Latin America. According to our numerical simulations, a complete multilateral liberalization would free 2.7 million individuals of poverty, and a Free Trade Areas of the Americas would lift about the same number out of poverty. With few exceptions tariff abatement helps the rural workers, one of the poorest groups, and increases demand and wages for factors of production owned by the poor. By reducing inequality, increased trade integration makes the growth process more pro-poor.
Our ex-ante numerical simulations assume flexible labor markets, and actually demonstrate that lowering flexibility reduces the pro-poor potential of trade reforms. Additionally, ex-post evidence for Latin America shows low labor mobility, partly due to the extensive regulations of the region's labor markets. In light of this, we analyze the data in the household surveys to confirm that labor market segmentation is indeed an important feature of LAC labor markets, and that the persistence of inter-sectoral wage premia has significant implications for both poverty and inequality. We also link sectoral wage premia to trade policy variables, reaffirming the importance of labor market flexibility for poverty reduction.

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1 Introduction and motivation

Starting in the mid 1980s, economic policy in the Latin American and Caribbean region has witnessed a profound shift from a development paradigm where the state played a prominent role to one where laissez faire and deregulation reinstated the market at the central stage. Policymakers expected these changes to accelerate productivity gains and promote growth and, at the same time, to foster employment creation and reduce poverty. Most of the earlier literature that studied this intense Latin American reform experience focused on the effects on aggregate growth. The emerging consensus from these studies seems to be that post reform growth has been disappointing but that without reforms the situation would have been even worse.[1] In fact, the relationship between trade liberalization – a key component of the reforms package – and growth has been scrutinized well beyond Latin America and although definitive empirical proofs have not yet been provided, most analysts believe that a positive link exists between openness and growth.[2]

More recently, a new strand of literature has focused on the effects of some of these reforms on income distribution and poverty.[3] These studies suggest that a meaningful analysis of the trade-growth-poverty nexus needs to be based on a combined macro-micro approach and has to consider country-specific features. Since reforms interact in complex ways at the microeconomic level, no obvious generalization is possible. This paper belongs to the second (microeconomic) wave of studies and examines how trade liberalization affects the growth process and whether the growth it generates is more or less pro-poor. We combine macro-micro simulation methodology with micro regression analysis to address two related questions: can trade reform reduce poverty in Latin America, and, if so, what are the reasons behind the inability of previous liberalization efforts to generate sustained poverty reduction? The focal point of our analysis is the interaction of trade openness and poverty through the labor market, which we argue is an especially important transmission channel in Latin America.

This paper is broadly organized in two parts. In the first we simulate various trade liberalization scenarios using a macro-micro modeling framework. Our scenarios show that multilateral as well as regional trade liberalization can be powerful tools in the fight to eradicate poverty. With some exceptions, tariff abatement generally favors the rural workers, one of the poorest groups, and increases demand and wages for factors of production owned by the poor. The main result, however, is how the introduction of more realistic labor market features in otherwise standard trade models can alter the usual predictions. For example, we discuss the role that labor market rigidities (which result in labor's failure to reallocate across sectors following trade reform) play in limiting the development potential of trade reform. The second part of the paper links our simulation

[1] See ECLAC (1996), IADB (1997), Burki and Perry (1997), Easterly, Loayza, and Montiel (1997), Lora and Barrera (1997).
[2] See Winters, McCulloch, and McKay (2004) for a survey of the empirical literature; Rodrik and Rodriguez (2001) provide a seminal critique.
[3] For an excellent collection of these studies, see the volume edited by Bourguignon, Ferreira, and Lustig (2004).

findings to extensively documented features of Latin American labor markets, such as persistent inter-sectoral wage differentials and large share of self-employed workers. Using regression analysis with household survey data, we confirm the importance of labor market rigidities for poverty and inequality, and establish a link between limited inter-sectoral mobility, poverty, and trade policy. Therefore, our *ex post* analysis verifies the presence of the very features that can block the pro-poor potential of trade reforms in our *ex ante* simulations.

2 Extending trade liberalization in Latin America: can the poor benefit?

2.1 Trade and poverty: a factor content approach

The remarkable shift in Latin American trade policy over the last fifteen years has clearly contributed to an increase in the region's trade exposure; however, at first sight, it does not seem to have particularly benefited the poor. As shown in Figure 1, the decisive increase in the trade to GDP ratio has been accompanied by a meager change in the poverty headcount. This apparent inability of trade liberalization to alleviate poverty in Latin America has often been used as an argument to show that the standard Hecksher-Ohlin-Samuelson (H-O-S) framework cannot be applied to this region. In other words, because Latin America's comparative advantage is not in labor intensive sectors, the direct link between greater trade openness and increased demand for labor,[4] and the subsequent link between higher wages and poverty reduction are valid but not applicable to this region. In particular, chapter 2 of De Ferranti et al (2002) documented that the regional pattern of comparative advantage in Latin America lies primarily in natural-resource and land-intensive commodities, having remained virtually unchanged since the early 1980s.

Using net exports per worker as a measure of comparative advantage and following Leamer's (1995) product categories, De Ferranti et al (2002) noted that the region as a whole is a net exporter of petroleum, raw materials, tropical agriculture, and, in the later part of the 1990s, animal products. Therefore, according to the H-O-S predictions, land and natural resources are the likely candidates to benefit from trade liberalization. Since these factors are often concentrated in the hands of the rich, trade reform is more likely to result in greater inequality rather than poverty reduction.

Although highly illustrative, this analysis is constrained by the fact that it does not consider more disaggregated factors categories, such as skilled and unskilled labor, and complementarities across factors. These refinements, however, are crucial for any analysis of poverty implications for several reasons. Firstly, unskilled labor is relatively abundant in Latin America (when compared to skilled labor) and unskilled labor income is the most important income source for the poor. Secondly, agriculture expansion, a likely effect of trade liberalization, benefits not only land ownership but also complementary inputs and specifically rural labor. To show this in a simple framework,

[4] In the relevant version of the H-O-S framework, labor is the relatively abundant factor used intensively in the exportable sectors.

we provide information on disaggregated factors demand of a 'typical' $1 of exports and a 'typical' $1 of imports for a number of Latin American and comparator countries. A 'typical" $1 of exports, or imports, is defined as $1 spread across the various commodities in the proportions shown in the total exports, or imports, for each country for the base year of 2001.[5] Direct coefficients reported in Table 1 show the factor requirements needed to increase production for an additional $1 of typical exports and factors replaced by an increase in $1 of typical imports. The qualifier 'direct' for these coefficients indicates that their calculation assumes that demand for factors changes only in the good's final production stage. The inputs required by that sector and produced (or imported) by other sectors generate, in a multiplier fashion, additional factors demand, but this is not accounted for in the direct coefficients. Thus, for example, in Argentina a dollar of exports distributed across sectors as they were in 2001 would generate 16c. of unskilled labor income, almost 4c. of skilled labor income, and 17.5c. of combined capital, land, and natural resources incomes. So, clearly, unskilled workers appear to be highly demanded in those sectors where production is oriented towards foreign markets and their share of the increased total factors income is almost equal to that of capital, land and natural resources combined. It is also interesting to see that a dollar of increased imports also displaces a large amount of unskilled workers and capital (an indication that intra-industry trade is quite significant), but that additional imports displace an even larger amount of skilled workers.

A balanced increase of a dollar in both imports and exports – shown in the "net" row of Table 1– would increase demand for unskilled labor by about 1.4c, an increase second only to that for land. Similar results are shown for the other countries considered in the table. In particular, unskilled workers in Central America, one of the poorest group of countries in the region, would seem to benefit from increased trade relatively more than other factors, and this could lead to a preliminary conclusion that trade liberalization could induce pro-poor developments, especially for Central America. Table 2 reports the results for the same factor content exercise with the difference that *total* coefficients include additional factors demand derived from the expansion of industries producing inputs used by the final exporting sector (i.e. the multiplier effect). By incorporating these additional multiplier effects, total coefficients are much larger than direct coefficients; however, the main conclusions derived before do not change: unskilled labor is among the largest beneficiaries of increased balanced trade. This analysis is consistent with De Ferranti et al (2002); however, it also shows that disaggregating labor into various skill types provides further insight on how poverty might be reduced by increased trade.

2.2 Macro-micro simulations: showing that trade can be poverty reducing

Some strong assumptions (such as fixed prices and no supply responses) limit the validity of the simple factor content approach, and more complex models need to be used to overcome these limitations and provide a more thorough analysis of the effects of trade on poverty. For instance, the factor content model assumes a fixed sectoral composition of export and output, whereas changes in relative prices due to trade liberalization should

[5] This year is also the base year for the global multi-country CGE model used in this paper.

normally induce sectoral specialization. Additionally, detailed household level data are normally required to translate changes in factors' incomes into poverty effects. To capture these sectoral reallocation effects and to evaluate poverty outcomes, we employ a computable general equilibrium (CGE) model coupled with a micro-simulation module.

CGE models have the advantage of being grounded in established trade and general equilibrium theories, of embedding enough data details so that they can be used to simulate realistic trade policy reforms, and of generating price effects that can be directly and unequivocally linked to these reforms. In this paper, we use the CGE model to create several trade reform scenarios and to evaluate the related factor and commodity price changes. The micro-simulation module is used in a sequential second step to map the general equilibrium price changes to adjustments of real incomes of individual households. The micro-module, by generating a new counterfactual income distribution for the simulated trade scenarios, allows us to analyze in detail the micro poverty and inequality changes induced by the aggregate trade policy shocks. The following sections briefly explain the model setup and present the main results, while a more detailed discussion is reserved for the Appendix.

2.2.1 Macro Model Setup

The macro model used in this paper is the World Bank's LINKAGE model—a relatively standard CGE model.[6] It is currently based on the GTAP Release 6.0 dataset with a 2001 base year. [7] All markets, including factor markets, clear through flexible prices and the model exhibits constant-returns-to-scale and perfect competition. The model is global, with a full accounting of bilateral trade flows, and its comparative static (as opposed to recursive dynamic) version has been implemented for the simulations described in this paper. With the exception of labor, factor mobility across sectors has been limited so model results should be interpreted as short to medium term impacts.

Model scenarios are implemented with two assumptions about unskilled labor mobility in developing countries: low and high. In the low mobility case, unskilled labor is segmented into farm and non-farm activities, so that the model produces two wages: one for each segment. In the high mobility case, we implement a migration function that is calibrated to the levels of rural-to-urban migration historically experienced in Latin America. In this case there are still two separate wage levels for each segment, but the wage differential across the two segments is reduced through inter-segments migration. In either case, skilled labor in low and middle income countries, as well as both labor categories in high income countries, is perfectly mobile across segments.

For this application, the GTAP data has been aggregated to 18 countries/regions with an emphasis on the countries in the Western Hemisphere (see Table 14). Canada and the United States have been aggregated together and most of the major countries in Latin America are identified separately. The remaining high income countries are aggregated

[6] See van der Mensbrugghe (2005) for a detailed description of the model.
[7] The Global Trade Analysis Project (GTAP) database and model are disseminated by Center for Global Trade Analysis of Purdue University.

into Western Europe and Asia and Pacific, while the rest of developing countries fall into one of five broad regions—East and South Asia, Middle East and North Africa, Europe and Central Asia, and Sub-Saharan Africa (aggregated with a small residual). The sectoral concordance (Table 14) focuses on some of the major protected commodities, including agricultural and food products, textiles, clothing and footwear, metals, and motor vehicles and parts. Though services are highly protected in most markets, the levels of protection are hard to measure and the GTAP dataset has little information in this area—thus the service sectors are highly aggregated for the purposes of this paper.

2.2.2 Micro Model Setup

The micro-simulation module is implemented using household surveys that, ideally, sample both income and consumption information; for this study we processed the most recent nationally representative surveys for four countries in Latin America: Brazil, Colombia, Chile and Mexico (the 2001 Pesquisa Nacional por Amostra de Domicílios, the 1997 Encuesta de Calidad de Vida, the CASEN 2000, and the ENIGH 2001, respectively). These four countries were chosen to highlight various aspects of poverty, inequality, and trade policy in Latin America.[8] Together, these countries account for more than 60 percent of the population and almost 70 percent of GDP in Latin America, and therefore paint a fairly representative picture of the region.

In order to accurately determine the poverty implications of trade liberalization, it is crucial to recognize that very few shocks are distributionally neutral, and an approach that combines the average income changes from a CGE with poverty elasticities does not seem very promising in evaluating the full poverty impact of trade reform. With a CGE model it is possible to identify and measure (at rather disaggregated levels) two important transmission channels between trade shocks and poverty changes: relative factor and goods price changes. However, since these results are market-wide averages, translating them into poverty impacts is not straightforward. Poor households benefit from these changes according to the composition of their income sources and final demands. And, in the case of high labor mobility, to assess whether poverty is reducing or not one needs information on the relative sizes of wages and poverty lines for workers migrating from a farm to a non-farm job. A micro-simulation methodology is used to link the CGE aggregate results to the four countries' household level data. For each household in each country' survey, we identify key income components, including incomes from skilled and unskilled labor – for both the farm and non-farm segment – capital, and transfers. The percent shares for these components for households at different levels of income are shown in Table 3. The changes in households' real incomes are then calculated by deflating the new (post-simulation) nominal income, obtained using the new factor prices, with a cost of living index (See Annex 6.1 for details). This is represented by a

[8] For instance, while in Chile the poverty incidence is almost the same in both rural and urban areas, rural poverty in Brazil is twice the urban rate, and the same ratio is 1.5 times in Mexico and Colombia. The distribution of income is much more equal in Chile and Mexico than it is in Colombia. While Brazil tends to protect its manufacturing sector, Mexico's tariffs are heavily biased towards agriculture, and Chile has a uniform tariff structure.

weighted average of the new food and non-food prices according to each household's share of food consumption in the total consumption bundle.[9]

A key advantage of using data from household surveys is that the whole income distribution is considered and heterogeneity across households is fully accounted. Table 3 shows just an example of this heterogeneity: at different levels of income, households rely on widely varying sources of earnings. Even with some marked divergence across the four examined countries, poor people normally depend heavily on unskilled labor incomes and on transfers and auto-consumption; however, rural poor – probably because of their higher reliance on auto-consumption – seem less dependent on unskilled labor income than urban poor. These statistics clearly show that no simple mapping can unambiguously link factors prices changes to poverty outcomes.

2.2.3 Macro simulation results

We use the macro model to simulate a series of different trade liberalization scenarios. In particular, a baseline scenario, which is a snapshot of the world economy in 2001, is contrasted with the following simulations:

- In the FTAA (Free Trade Area of the Americas) scenario, tariffs and export subsidies among the Western hemisphere countries are eliminated (set to zero).
- In the Full Liberalization scenario, tariffs and export subsidies are eliminated for all countries. We also eliminate factor subsidies in all countries, which include capital, land, producer, and indirect subsidies.
- In the Doha scenario, tariffs are lowered according to a tiered formula in agriculture and manufacturing, while export subsidies are eliminated in all countries. In addition, domestic support (factor subsidies) is reduced in the US and Canada by 25 percent, and the 25-member European Union by 15.9 percent.
- In the WHCU (Western Hemisphere Customs Union) scenario, in addition to implementing the FTAA, the common external tariff is set at 6.5 percent (similar to Chile's level of protection) for developing country members. The US and Canada maintain their tariff structure vis-à-vis the rest of the world.

First, consider the above scenarios under the assumption of low factor mobility. In this case economies adjust to the trade shocks mainly through wage changes. In all four simulations, Brazil and Chile experience an increase in the payments to unskilled farm workers and a decrease in the skilled/unskilled wage gap for the agricultural sector. In Colombia, unskilled agricultural labor gains only in the case of multilateral liberalization, while in Mexico, unskilled agricultural workers lose in all cases except in the Doha scenario. These results are consistent with the design of each liberalization scenario, and differences across countries reflect their particular patterns of protection and comparative advantage.[10] For example, Brazil's comparative advantage lies in agricultural products

[9] An important assumption in the micro-simulations is that price changes are equal across the whole country. This is not always the case and pass-through can be different according to the distance from the border, the types of traded goods, and other factors which can be household specific. For an example of an analysis that takes into account geographic price differentials in Mexico see Nicita (2005).

[10] See Annex 6.2 for more information on the structure of tariffs and production for each of the sample countries and for more detailed CGE results.

and its biased tariff structure grants more protection to manufacturing sectors. Consequently, trade reform leads to an expansion in production of agricultural goods, and, since labor does not move between agricultural and non-agricultural activities, wages in the farm sectors increase significantly. On the other hand, domestic prices decline in the previously protected manufacturing sectors, which reduces production and wages in that sector. The same effect takes place in Mexico, only with the sectoral roles reversed—since Mexico's agriculture is relatively more protected, farm wages suffer vis-à-vis non-farm earnings. The case of Mexico is particularly interesting because, in addition to the aforementioned effect linked to the initial protection, another phenomenon takes place—preference erosion. Across all of the four liberalization scenarios analyzed here, Mexico loses the margin of preference it enjoys as a NAFTA member with respect to other Latin American countries. This is one of the reasons why Mexico's non-farm wages do not experience a significant increase—it already has virtually tariff-free access to its biggest market, USA and Canada, and further regional or global liberalization only serves to open the North American markets for its competitors.

The previous analysis generates some extreme wage responses given the (somewhat unrealistic) assumption that unskilled labor cannot move across the farm and non-farm segments. To relax this assumption and allow individuals to switch employment in response to demand shocks, a migration function is added to the model specification. This function is calibrated to a base level of migration, so that when demand for farm activities increases, migration from farm to non-farm activities is reduced. With this setup, the direction of unskilled labor wage changes remains largely the same but the magnitude is considerably smaller, as increases in unskilled labor demand are met not only through wage adjustments but also through growth in the stock of labor due to inter-segment migration. This different adjustment mechanism for the unskilled labor market has some influence on the price changes of the other factors, too, but the relative changes are similar to the low mobility scenario (for detailed analysis of the CGE results, see Annex 6.3 and 6.4).

2.2.4 Micro simulation results

The micro-simulation poverty effects of the four liberalization scenarios are shown in Table 4. Apart from the Mexican case, poverty is reduced by trade liberalization in all of the other countries; and the larger the liberalization, the stronger the poverty reduction. The multilateral Doha case, by imposing fairly low tariff abatement in developing countries, is in most cases less pro-poor than the regional case of the FTAA, at least for the countries analyzed here. Furthermore, due to the trade-induced price effects and higher initial poverty levels, farm households enjoy on average larger percent poverty reductions. Finally, Table 4 shows that flexible labor markets are associated with stronger poverty reduction.

Perhaps the most persuasive way to highlight the pro-poor effects of trade liberalization is to compare the poverty results obtained by a distributionally neutral growth with those generated by the various trade liberalization scenarios. This comparison is summarized in Table 5 in terms of poverty elasticities. The growth elasticity in Table 5 is calculated by applying a distribution-neutral growth rate to the incomes of every household in the

survey. Thus, this elasticity represents the percentage change in the poverty headcount that corresponds to a one percentage point increase in the growth rate in the *average* per capita income in a given country. The trade elasticity, on the other hand, takes into consideration changes in the shape of the income distribution and is calculated using actual heterogeneous income growth rates for each household. The decomposition of poverty results into trade and growth components illustrates five different points: i) the examined countries have different growth elasticities; ii) trade elasticities are almost always larger than growth elasticities; iii) trade elasticities are not the same across countries; iv) they are not the same across types of liberalization; v) trade elasticities are normally higher the higher the mobility of labor.

The initial level of inequality, i.e. the 'shape' of the initial income distribution, and the level of the poverty line determine how many individuals escape poverty with a 1% increase in average incomes. In fact, Colombia, which shows the smallest growth elasticity in Table 5, is the country with the highest initial level of inequality and this means that many of its poor people are still quite 'distant' from the poverty line and a lot of growth is needed to lift them out of poverty. On the contrary, thanks to its much less unequal income distribution, growth of average incomes can be fairly effective in reducing poverty in Chile. Intermediate situations are observed for Mexico and Brazil.[11] Therefore, point ii) above is one of the key results of this study: trade liberalization induces pro-poor growth in most of the cases examined here. In fact, the difference between the growth elasticity in the first column of Table 5 and the trade elasticities of the rightmost columns represents the equalizing distributional effect of trade reform (although due to non-linearities, the growth and the inequality effects are not strictly additive). Trade liberalization helps the poor by raising prices of the factors owned by the poor or by reducing the prices of the goods consumed by them.

The data in Table 5 also show that the degree of poverty reduction is positively correlation with the scope of trade liberalization. Trade reform generates large poverty reductions for the initially poorer households, namely those earning large shares of their incomes from agricultural sectors; much lower trade-induced reductions are observed for households dependent on non-agricultural incomes. This shows that trade reform, if implemented successfully, can have a significant pro-poor distributional effect in addition to the positive effect that it has on average incomes. In other words, not only can trade reform shift the entire income distribution, but it can also affect its shape, and this distributional effect depends on the type of liberalization. Finally, Table 5 shows that labor market rigidities can have a significant impact on the poverty effects of trade reform. The last column of Table 5 illustrates the poverty impact of a set of high mobility scenarios, where we mirror the migration function of the CGE model with a micro migration algorithm that allows individuals to move across farm and non-farm sectors

[11] The initial inequality statistics (calculated on household per capita income) are as follows:

	Brazil	Chile	Colombia	Mexico
Poverty gap	0.10	0.07	0.33	0.21
Squared poverty gap	0.05	0.04	0.22	0.11
Gini coefficient	0.59	0.57	0.63	0.53

until the aggregate labor force shares in each sector (given by the macro model) are satisfied. This set of results shows that relaxing labor market constraints can have significant pro-poor effects in Latin America. Now in all cases, trade reform is unambiguously poverty-reducing. This further supports the notion that the H-O-S dynamics, which are underpinning our macro model, are indeed poverty-reducing in Latin America, and more so if some factor mobility is allowed.[12]

To understand the effect of factor mobility on poverty in more detail, Table 6 decomposes the poverty reduction results into migration and price components. These components are estimated by performing the micro-simulations in two steps. First, we pass the macro migration-consistent factor and consumption price changes to the micro-model, but no individual has yet migrated across sectors. These 'price-only' results are shown in the last column of Table 6, and capture the effect that price changes alone would have on the poverty headcount in the case of high labor mobility.[13] Interestingly, these figures are very close (actually slightly lower) than those shown in the 'trade elasticity - low mobility' column of Table 5: it seems that switching employment is more effective in reducing poverty than earning a higher wage in the initial occupation. In the second stage, we allow individuals to migrate, and therefore capture the total effect of migration on poverty. Thus, the difference between the two columns of Table 6 is the effect of physically moving individuals across sectors, although, as before, the price and migration effects are not strictly additive due to the non-linear nature of the model. The results in Table 6 further illustrate the important role that labor market constraints play in determining the poverty reduction potential of trade reform. In most cases, simply relaxing these constraints results in much more pronounced decreases in the poverty headcount. In the case of FTAA in Mexico, allowing for migration actually reverses the sign of the effect, and trade reform becomes pro-poor instead of anti-poor.

In order to put the country-specific results in a broader regional context, Table 7 aggregates the initial poverty statistics and the post-reform poverty reduction (high-mobility scenario) for the four sample countries. Overall, the reduction in poverty as a result of trade liberalization is significant—2.6 million or 2.3 percent of the population of the four countries. Curiously, both the FTAA and the full liberalization scenarios generate similar decreases in the number of poor. However, this aggregate result is achieved by quite different means—as a result of the FTAA, poverty is reduced mainly among non-farm households in Mexico, while following full liberalization, poverty reduction is achieved through income gains among farm households in Brazil and Chile.

2.2.5 Compatibility of various liberalization scenarios

Up to this point, we have considered the poverty reduction potential of various liberalization scenarios independently of each other. However, since negotiations on regional and multilateral reform often take place simultaneously, policymakers are

[12] Notice that our "high-mobility" scenario is not equivalent to full factor mobility—land and capital markets remain segmented, and the migration function only allows for some movement of unskilled labor.
[13] Of course, in order to generate these price changes, we had to allow migration on the macro level. Thus, at this stage of decomposition there is an inconsistency between the macro and micro models, since we allow inter-sectoral labor mobility at one level but not at the other.

legitimately concerned about the compatibility of various liberalization scenarios with each other. To address this concern, we contrast the FTAA, WHCU, and Doha scenarios with global free trade (Full Lib) by considering the patterns of comparative advantage implied by each scenario. That is, we would like to know whether the "partial" liberalization scenarios result in a sectoral allocation of resources that is compatible with full liberalization. If partial liberalization attracts resources to the same sectors that would prosper under global free trade, the scenario is congruent with the full liberalization. If, on the other hand, a scenario results in a sectoral allocation of resources different from that implied by full liberalization, then additional costs must be incurred to re-allocate resources when (if) global free trade is concluded.

We assess the compatibility of each partial scenario with global reform by creating a measure of labor market "churning" generated by each scenario[14] and converting it into a distance metric. The distance metric consists of two parts: 1) the distance from the initial point to the partial reform scenario, and 2) the distance from the partial reform scenario to global free trade. Thus, it is a two-step distance from the initial point to full liberalization, and, if the partial reform is perfectly compatible with global free trade, this distance should be exactly equal to the one-step distance of moving from the initial point to full liberalization directly. We normalize this measure of congruence so that it is equal to 1 when a partial reform is perfectly compatible with global free trade, and is greater than 1 when additional labor market "churning" is required to reach the desired outcome in two steps. The congruence measure is summarized in Figure 2.

Figure 2 highlights significant cross-country differences in the compatibility of partial liberalization scenarios with full liberalization. For Brazil and Colombia, all three scenarios do not generate significant additional costs in adapting to global free trade. This is driven by the fact that the initial level of protection in these countries is relatively high and their regional comparative advantage is in similar products as their global comparative advantage. Thus, even the Western Hemisphere-biased tariff reductions undertaken under regional liberalization scenarios bring these countries closer to the situation of global free trade. For Chile, on the other hand, regional liberalization is very costly in terms of subsequent transition to global full trade. This is because Chile's tariffs are already low and relatively equal across trading partners—therefore regional liberalization results in re-allocation of resources away from its comparative advantage under full liberalization. Finally for Mexico, regional liberalization further reinforces the regional bias of the country's production structure and therefore significant adjustment is required during the transition to global free trade. In all cases, such adjustments are likely to involve significant transition costs, both in terms of physical reallocation of labor across sectors and the poverty implications of these movements.

The above analysis shows that sequencing of trade reforms is an area of significant policy concern. For example, policymakers may be inclined to advocate "minor" regional liberalization as a stepping stone to "major" global reform. However, as illustrated in

[14] This is calculated as the sum of squared deviations in sectoral labor demand between the full liberalization and the other three scenarios. For more details on this approach, see Chapter 6 of World Bank (2004).

Figure 2, such policy may take a country further away from the multilateral outcome than if had undertaken no reform at all. If labor markets are not very flexible, the costs of reallocating labor once for the regional and then again for the global scenario are likely to be very high, both in terms of lost productivity and the increased government spending on job training and social safety nets. On the other hand, some of these costs could be mitigated by various advantages of regional cooperation which are not considered in the above analysis—economies of scale generated by larger markets, improvements in investment climate, greater labor market flexibility through deregulation and/or increased migration, etc. However, the key policy message is that reallocating labor across sectors is costly, particularly so when labor markets are rigid, and failure to carefully consider the sequencing of trade policy reforms can result in large additional adjustment costs.

3 Extending Latin America's trade liberalization: why the poor may not fully benefit?

The results of the simulations done with our CGE model emphasize that increasing inter-sectoral factor mobility magnifies the pro-poor effects of trade policy reforms. One would thus expect that in the medium to longer run, when factor mobility is higher, more liberal commercial policies should be associated with lower poverty rates. However, as previously shown in Figure 1, the intense trade liberalization efforts of the 1990s do not seem to be accompanied by any decisive poverty reduction. So the question becomes: what possible factors may hinder the pro-poor outcomes of trade liberalization, or, more precisely, has labor markets' inflexibility limited the potential poverty reduction associated with increased trade?

The following stylized facts – reviewed in more detail below – support this 'low flexibility - slow poverty reduction' hypothesis: [15]

- Inter-sectoral wage premia are high and persistent in Latin American countries, signaling low inter-sectoral mobility.
- Regional labor markets are heavily regulated and thus fairly rigid. Furthermore, the large share of informal employment in the region, partly a consequence of its regulation, does not necessarily help increasing the flexibility of labor markets. In fact, contrary to what is normally expected, the norms and rules governing the formal segment are also quite often binding in the informal segment.
- Self employed workers, on average poorer than wage workers, seem to suffer from lower mobility and thus, on average, are less able to take advantage of the opportunities created by trade liberalization.
- Finally, the probability of being poor is highly correlated to the sector of employment of the head of the household or of other income earning members.

[15] In this section we do not actually construct a full micro model of income determination and *test* the mentioned hypothesis but present evidence, drawn from household surveys, supporting it. A few studies, for instance, Bourguinon, Ferreira, Lustig (2004), Szekely et al (2004), do that by using more complex econometric techniques to analyze the evolution of income distribution. Some of their conclusions still support our views. In particular, increased labor market participation and *switching employment* are identified as important sources of poverty reduction.

These characteristics and the fact that trade protection and trade exposure – proxies for import penetration and dependency on export sales – vary across sectors determine the final poverty results of a trade shock. In other words, when trade policy is changed, production and employment are not uniformly affected across sectors, and whether workers (or employers) can move to expanding sectors or are trapped in contracting ones is a key determinant for income, and poverty, changes.

Formal estimation of labor market segmentation

Sectoral wage premia, interpreted as a failure of the labor market to behave competitively, have been documented as early as the 1950s when Slichter (1950) conducted his seminal analysis of the wage differentials for unskilled workers in manufacturing industries. One of the most often-cited studies is Krueger and Summers (1988), who find persistent industry wage differentials in the US that cannot be readily explained by unmeasured ability. Instead, by showing that wage premiums are highly correlated across firm sizes, regions, and occupation tenure, the authors conclude that higher-wage industries command uncompetitive rents. In a more recent study focusing on LAC countries,[16] Abuhadba and Romaguera (1993), using a similar specification, find significant inter-sectoral wage differences that persist even after accounting for the standard individual wage determinants. Similar to Krueger and Summers (1988), they cannot relate these differences to unmeasured ability due to high correlation of wage premiums across occupations. In addition, comparing their estimates to those presented in earlier studies, the authors note that both the magnitude and the variance of inter-sectoral differences in wages are larger in Latin America than in high-income countries. Furthermore, the sectoral wage premia persist over time, suggesting that the inter-sectoral differences are a structural feature of the LAC labor market rather than a temporary disequilibrium.

In order to assess the flexibility of labor markets for each of the countries in our sample, we begin by following previous approaches and estimate standard Mincerian wage equations. In addition to the usual controls for education, experience, gender, and region, we explicitly consider each individual's sector of employment. For each country, the model was estimated separately for the wage workers and self-employed and included a larger number of regional and sectoral dummy variables than those shown in Table 11.[17] The individual country models describe the underlying data quite well, as evidenced by the relatively high R^2 and the significance and expected sign of the main explanatory variables. Thus, there are greater returns to higher education, positive but diminishing

[16] The sample includes Brazil, Chile, Uruguay, and Venezuela.

[17] Only the most statistically significant variables are shown. The full variable list for Brazil includes: 3 primary, 2 secondary, and 1 tertiary education dummy, experience, experience squared, a gender dummy, 3 racial dummies, an urban dummy, 4 regional dummies, dummy variable for isolated rural areas, 16 sectoral dummies. The list for Chile includes: 2 primary, 2 secondary, 1 tertiary education dummy, experience, experience squared, a gender dummy, an urban dummy, 12 regional dummies. The list for Colombia includes: 3 primary, 2 secondary, and 1 tertiary education dummy, experience, experience squared, a gender dummy, dummy variables for coffee, cocoa, and plantains, 8 regional dummies, an urban dummy, 11 sectoral dummies. The list for Mexico includes: 3 primary, 2 secondary, and 1 tertiary education dummy, experience, experience squared, a gender dummy, 3 regional dummies, an urban dummy, 7 sectoral dummies.

return to higher levels of experience, and males and urban dwellers tend to earn significantly more than females and rural residents (note that the definition of the gender dummy varies across countries). There is significant regional variation in earnings, again consistent with our expectations (in Brazil, Chile, and Colombia the reference region is the capital city whereas for Mexico, the reference region is South-East). Most importantly, we find that sector of employment is a significant determinant of wages.[18] The last result provides evidence of labor market rigidities (segmentation at the sectoral level) which are manifested in persistent inter-sectoral wage premia.[19] Our results are thus consistent with the large body of literature on wage determination, particularly the research studying inter-industry wage differentials. In addition, Section 2.2 has already shown that trade protection and exposure are different across sectors and that trade benefits are magnified when resources are free to move across sectors. Since high and persistent inter-sectoral premia signal lower mobility, their presence may hinder the benefits of increased integration or exacerbate the costs for those workers who cannot move out of shrinking sectors.

Labor economists point out that excessive regulation may be a primary cause of inter-industry wage premia and lower mobility. As Heckman and Pages (2003) put it: "Dismissal costs and other regulations not only increase labor costs, but also alter firms' firing and hiring decisions. The importance of dismissal costs in Latin America is clearly shown in Table 9. Whereas non-wage labor costs are low relative to those of OECD countries, dismissal costs tend to be very high. These costs make Latin American labor markets *less flexible* than OECD markets and likely impair productivity and *adaptation* to *new* technology and *trade patterns* as they do in Europe" (p. 38 emphasis added).

Additionally, higher regulation costs are usually associated with high levels of informality and, as shown in Table 10, this is certainly the case for Latin America. However, a large pool of informal workers does not increase the average flexibility of labor markets. In fact, informal workers, although legally unprotected, are quite often practically covered by the same laws and regulations that protect formal workers. As pointed out in a LAC Labor team note (2004) "despite concerns about enforcement, kernel density plots suggest that the minimum wage is often binding [in the informal sector] and sometimes strongly, as in the case of Colombia. Studies also confirm as a general rule in the region, the existence of what Neri and others term the "efeito farol" or lighthouse effect, that the minimum wage is more binding in the informal than the formal sector. This adds support to the idea that the informal sector is not completely unprotected by social norms, but in fact is covered by notions of fair wages." This observation helps to explain the persistence of inter-sectoral wage premia among the self-employed in our sample. If rules and regulations of the formal sector are also often binding in the informal sector, the self-employed will be affected by lower mobility

[18] The coefficients reported in the table are for those sectors most statistically significant in determining the income of the self-employed. The same sectors are usually, but not always, also significant in wage worker earnings determination. Altogether for the self-employed, 14 sectors are significant for Brazil, 7 for Chile, 6 for Colombia, 1 for Mexico. For the wage workers, 16 sectors are significant for Brazil, 7 for Chile, 6 for Colombia, 7 for Mexico.

[19] Low inter-sectoral mobility in LAC labor markets has been documented in a number of other studies—see Goldberg and Pavcnik (2004) for a review.

(manifested in significant sectoral wage differences) similar to the wage workers. Therefore, tight labor regulations tend to increase average employment tenure but also discourage employment creation and may exacerbate the effect of a shock by hindering adjustment both in formal and informal segments of the labor market.

Does a large share of self-employment in the labor force hinder poverty reduction?

An important feature of Latin American labor markets, likely linked to their extensive regulations, is the high share of self employed workers in total employment. Additionally, households with a self-employed head are normally poorer than other households. Are self employed workers less mobile than wage workers, and thus more likely to be negatively affected by trade shocks? In order to answer this question, we implement a set of simulations to see whether the large share of self-employment in Latin American labor markets helps to explain the high income inequality and low poverty elasticity (at least for some countries) of the region.

Self employment (a proxy for informality) plays a significant role in determining labor income inequality in LAC. The first two rows of Table 12 show that, with the exception of Colombia, labor income inequality among self employed is almost twice that of the wage workers. A large fraction of this higher inequality is accounted for by the greater risk connected with self employment activities (see Wodon and Maloney 2000), and then by the higher premia received by the self employed for their experience, education and other wage determinants.[20]

The simulations shown in Table 12 (calculated using the coefficient estimates reported in Table 11) illustrate these points more precisely. In the first simulation we assume that all uncertainty disappears and that Mincerian equations perfectly predict the self-employed and wage workers earnings; in other words, we eliminate residuals from the earnings estimation. Inequality results for this simulation are reported in the row labeled 'Simulation using no residuals' and they show that inequality is reduced more for the self-employed than for the wage workers, in accordance with our expectations.

The next simulation consists of assigning to the self employed, while maintaining their coefficients, the levels of experience, education, and the other independent variables of the wage workers. Again we notice (in row 'Simulation using WW independent vars') a further reduction in inequality due, in this case, to the lower inequality in the labor income determinants of the wage workers. The following experiment, 'Simulation using WW coeff's', estimates the inequality effects of the self-employed receiving the same wage premia (i.e. the marginal contribution of their experience, education, and other income determinants) as the wage workers. The resulting decrease in Theil index shows that higher (absolute) values of the self-employed premia exacerbate the inequality of their education, experience, etc. endowments.

Two additional simulations are particularly relevant since they link this analysis of earnings inequality to labor mobility and thus to the labor markets' capacity to adjust to a

[20] See the regression coefficients in Table 11.

trade shock. As already mentioned, inter-sectoral wage differentials are an indirect measure of labor mobility: higher inter-sectoral premia signal lower mobility. The final two rows of Table 12 show that self employed are indeed affected by a lower degree of mobility (or by an average higher inter-sectoral dummies coefficients). By allowing the self employed to experience the sectoral employment distribution of the wage workers (i.e. the wage workers' independent employment dummies values) or by giving them the wage workers dummies coefficients, we notice that self employment labor income inequality is greatly reduced. Figure 3 shows that, on average, the share of inequality reduction attributable to inter-sectoral premia alone – and thus indirectly to capacity to move across sectors – is up to 30% of the total possible reduction, i.e. of 'completely transforming' every self employed into a wage worker.

Poverty profiles: does the sector of employment matter?

Up to here we showed that high inter-sectoral earnings differentials are a sign of some inflexibility of Latin American labor markets, and that this inflexibility affects the large number of self employed workers, even if supposedly these should be less constrained by formal regulations than wage workers. In fact, earnings inequality, another sign of low mobility, is higher among the self employed than the wage workers. How all this is linked to poverty?

Recent literature draws attention to the existence of poverty traps characterized by situations where occupational (or technology) choices are discrete, and where choosing a higher return occupation implies large sunk or fixed costs (Barrett 2004). Moving out of self employment, where poverty rates and inequality are higher, or simply finding a job in a different sector, are two examples of such choices. Being employed in a specific sector and being poor should not be correlated, however the mentioned poverty trap hypothesis and empirical evidence for Latin America indicate a strong correlation between the two.
Even after controlling for a standard set of independent factors, sectoral employment dummies still carry statistically significant high correlation with poverty levels. We explored this using multivariate regression analysis which helps to establish a ranking of the most important correlations, if not causation, among a set of different factors. Table 8 summarizes the poverty regression results for Brazil, Chile, Colombia, and Mexico. The estimates are done at the household level, where the dependent variable is the relative distance from the poverty line $\left(\ln\left[\frac{PerCapitaIncome}{PovertyLine}\right]\right)$ and the independent variables include the age of the head and spouse, their educational attainment and whether they are self-employed, wage workers, or unemployed, the number of dependents in the family, and sector of employment dummies.[21] Each country specification was estimated separately for rural and urban households and included a set of regional and, for Brazil, racial dummies.

The fit of each of the country models is quite good, and most of the coefficients are significant and carry the expected sign. The most important finding is that sector of

[21] The number of sectoral dummies varies by country, but only the six most statistically significant estimates are shown to conserve space.

employment of the household head appears to matter for poverty. For the larger surveys in our sample—Brazil and Chile—all sectoral dummies are significant, while for the other two countries, some sectors are not significant. However, even in the latter case, a Wald test confirms that the sectoral effects are significant as a group and therefore improve the prediction power of the model. The coefficient signs on sectoral employment are consistent with our expectations: in all cases, a household is more likely to be poor if its head is employed in agriculture or construction as opposed to public or general services. On the other hand, the employment of the household head in natural resource-intensive sectors such as mining or petrochemicals tends to leave the household better off than if the head were employed in the reference sector since the coefficients on the former variables are positive.

Using the estimates in Table 8, we can also quantify the gains or losses in the household incomes from switching employment. For example, consider the effects of the household head moving from the reference sector (i.e. public administration or general services) to the fossil fuels sector (we will use mining as a substitute for Mexico). In Brazil, Chile, and Mexico, this results in a considerable growth in the household's earnings—the normalized distance from the poverty line (defined as household per capita income divided by the poverty line) increases by 12, 14, and 26 percent, respectively. For Colombia, the results are even more striking—starting from an initial point where the average household per capita income in the reference sector is approximately 7 percent below the poverty line, the normalized earnings increase by 80 percent and bring the average up to 68 percent above the poverty line.

In another experiment, we contrast the effects of increasing education with changing occupation. That is, we simulate the effect of completing primary education for household heads employed in agriculture and compare the gains obtained in this way with those generated by switching employment (namely, moving to the reference sector while maintaining the initial fixed level of education). In Brazil and Chile, the negative wage premium of working in sector 1 eliminates most of the gains from completing primary education. Allowing household heads to finish primary education results in a 61 and 24 percent increase in normalized earnings, respectively. Income gains associated to the head's migration to a job in the reference sector are instead equal to 51 percent in Brazil and 10 percent in Chile. In Mexico, completing primary confers benefits that are almost equal to the disadvantages of being employed in agriculture —education's gains are 33 percent and agricultural employment disadvantage is 35 percent. For Colombia, the benefits of switching employment are so high that they even outweigh those obtained by completing primary education: finding a better job increases the normalized per capita income by 56 percent while completing primary school results in a 39 percent gain.

3.1 Poverty, Labor Mobility and Trade

The previous section has established a link between poverty and sectoral wage premia, but we have not yet been able to connect this finding to trade policy. This section attempts to establish an empirical link between wage income, wage premia, and tariff levels by setting up a simple two-stage model for Brazil (the largest survey in our data).

The two-stage specification, where the dependent variable for the second stage is estimated as one of the regressors of the first stage, has been widely used in the recent literature on wage premia. For example, Gaston and Trefler (1995) rely on the two-stage model to estimate the effects of trade and trade policy on union and non-union wages for the US. In one of the more well-known applications, Feenstra and Hanson (1999) apply the model to estimate the relative influence of trade versus technology on wages. Finally, Goldberg and Pavcnik (2003) use the two-stage methodology to relate the sectoral variations in informal employment to trade policy.

In the first stage of the analysis, we estimate a standard Mincerian specification by regressing the log of individual labor earnings on a set of income determinants including education, experience, gender, racial and geographic characteristics, and sectoral affiliation. The regression is done separately for the wage workers and the self-employed, and the sectoral coefficients estimated in the first stage are combined into a dependent variable vector for the second stage. In this second step, the estimated sectoral wage premia are regressed on the level of tariffs in the relevant sectors, effectively linking inter-sectoral wage differentials to trade policy. Based on the earlier regression results, we expect to find significant inter-sectoral wage differences in the first stage. In the second stage, we expect to find a positive relationship between wage premia and tariffs: industries that lobby more effectively for protection against foreign competition (manufacturing in the case of Brazil) may also afford to pay higher wages. The results of the first and second stage are shown in Table 13 (we omit the coefficients on the model's 36 sectoral dummies and the constant).

The first stage model explains more than 50 percent of variation in individual wages, and all standard wage determinants are significant and carry the expected sign. Most of the sectoral employment dummies are significant as well, which indicates that labor market segmentation persists at a more detailed level than shown in Table 11. In the second stage, shown in the bottom part of Table 13, we consider only those observations with a positive tariff rate, therefore excluding various service sectors. Despite the limited number of observations, the coefficient on the tariff variable is positive and significant at the 99 percent level for the wage workers and 95 percent level for the self-employed, which suggests that tariffs, and therefore trade policy can explain some of the variation in inter-sectoral wage premia. This is consistent with our prior expectations and, without implying causation, indicates that more heavily protected sectors also command greater wage premia. This result, however, is much stronger for the wage workers than the self-employed. In fact, while the second stage estimation for wage workers explains more than 40 percent of the variation in inter-sectoral wage differentials, the R^2 of the model for self-employed is only 11 percent. This is likely due to the distribution of self-employed and wage workers across sectors in Brazil. Consider that the vast majority of the self-employed (over 60%) participate in various service sectors such as construction, transport, commerce, and general services, where the link to trade policy is harder to establish or the goods are non-tradable. Among the remaining 40 percent participating in non-service activities, the bulk of the self-employed (32% of total) are in the agricultural sectors, where protection is generally low. Since only a small fraction of the self-

employed work in the mining or manufacturing sectors, it is not surprising that the link between domestic protection and the wage premia for the self-employed is much weaker.

Notice that the findings of Table 13 should not be interpreted as suggesting that lower tariffs are correlated with less pronounced sectoral wage premia and greater labor market flexibility. Misreading the results in this fashion would imply an inconsistency between, on the one hand, our findings that intersectoral wage differentials have continued to persist in Latin America even after tariffs declined significantly from the early 1990s levels, and on the other hand, our argument that labor market rigidities have been one of the reasons behind the failure of Latin American trade reform to reduce poverty. Instead, our results show that the distribution of tariffs (and not their level) is an important determinant of wage premia and consequently wage earnings. This distinction is crucial for Latin America, where average tariffs have declined substantially over the last decade but the structure of tariff schedules has remained largely the same. For example, while the average tariff in Brazil has declined by 75 percent between 1990 and 2001, the correlation between tariffs in different sectors has remained high (above 75 percent) throughout the period. Since the relative degree of protection afforded to each sector has not changed much, the wage premia have also been slow to move.

4 Conclusions

A large body of research on the relationship between trade openness and poverty reduction suggests that trade liberalization may be a powerful policy in the fight against poverty in Latin America. In this paper, we have focused our analysis on two questions: can trade liberalization bring about poverty reduction in Latin America, and what are the reasons behind the inability of earlier trade reform to generate sustained reduction in poverty? Since, as documented in the literature, the relationship between trade and poverty is multifaceted, we have chosen to concentrate on a specific channel of transmission of trade-induced shocks to the income distribution—the labor market.

In order to address the first question, we employ a macro-micro approach by linking a global CGE model with a set of household surveys for Brazil, Chile, Colombia, and Mexico. Our simulations show that both regional and multilateral trade liberalization can be poverty-reducing, as both a global free trade scenario and an FTAA lift approximately 2.7 million people in the four countries out of poverty. However, the results vary significantly by country—while in Brazil and Chile the main beneficiaries of trade are the poor in agriculture, in Mexico the income gains are biased towards the non-farm workers. These differences are explained by the economic structure and the pattern of protection exhibited by each country, with the most heavily protected sectors experiencing a post-liberalization decline in incomes. The most important finding, however, is the critical role that labor market flexibility plays in determining the pro-poor potential of trade reform. Allowing individuals to switch sectors of employment in response to trade shocks significantly enhances poverty reduction and, in the case of Mexico, even switches the outcome of reform from anti-poor to pro-poor. Decomposition analysis reveals that the physical movement of people across sectors (after accounting for price effects) is

responsible for a significant share of the additional poverty reduction experienced in the high labor mobility scenarios.

Having established the role of labor mobility as a crucial determinant of the pro-poor potential of trade reform, we turn to the household surveys to assess the constraints on labor market flexibility in the four sample countries. Our results show that LAC labor markets are characterized by substantial sectoral segmentation, which impedes inter-sectoral mobility and can prevent efficient adjustment to trade policy shocks. We begin show that sector of employment is a significant determinant of labor income, even after accounting for individual characteristics such as age, experience, education, and location. The sectoral wage premia are large, and are comparable in absolute magnitude with the effect of completing primary education. One of the potential reasons for low inter-sectoral mobility is the extensively documented evidence of heavy regulation of both the formal and informal segments of the Latin American labor markets, which may also explain why the self-employed appear to be affected by similar mobility constraints as the wage workers. We investigate this relationship further by quantifying the importance of the sector of employment for inequality, done by comparing the values of the Theil index across the self-employed and wage worker groups. Our simulations show that the higher levels of inequality among the self-employed are due in large part to their sectoral affiliation and that replicating the wage workers' sectoral affiliation structure among the self-employed leads to halving the latter's inequality in Brazil and Mexico. In the final step, we use a two-stage estimation procedure for Brazil to establish a relationship between sectoral wage differentials and the economy's tariff structure, suggesting that more heavily protected sectors tend to receive greater wage premia. This result further illustrates the role of the labor market as a link between trade policy and poverty reduction.

The policy significance of our findings lies in the fact that while various trade liberalization scenarios in Latin America can indeed be poverty-reducing, labor market flexibility is a key determinant of this result. A clear illustration of the complex and sometimes counter-intuitive ways in which trade and labor market imperfections interact should help policy makers dismiss mounting pressures for protectionism, especially when trade is considered the main culprit for increasing inequality. At the same time, our regression results show that LAC labor markets remain segmented and that persistent inter-sectoral wage differentials are related to trade policy. This confirms the importance of flexible and efficient labor markets as a crucial component of pro-poor trade reform and also provides possible clues for the limited poverty reduction effects of previous trade liberalization efforts.

5 References

Abuhadba, M. and P. Romaguera (1993), "Inter-Industrial Wage Differentials: Evidence from Latin American Countries", The Journal of Development Studies, 30(1): 190-205.

Burki and Perry (1997),

De Ferranti, D., G. Perry, D. Lederman and W. Maloney (2002), From Natural Resources to the Knowledge Economy, World Bank, Washington, DC.

Easterly, W., N. Loayza and P. Montiel, (1997), "Has Latin America's Post-Reform Growth Been Disappointing?" Journal of International Economics, 43: 287-311.

ECLAC (1996)

F. Bourguignon, F. H. G. Ferreira, and N. Lustig (2004), The Microeconomics of Income Distribution Dynamics, World Bank and Oxford University Press, New York.

Feenstra, R. C. and Hanson, G. H. (1999), "The Impact Of Outsourcing And High-Technology Capital On Wages: Estimates For The United States, 1979-1990", Quarterly Journal of Economics, 114: 907-940.

Gaston, N. and D. Trefler (1995), "Union wage sensitivity to trade and protection: theory and evidence", Journal of International Economics, 39: 1–25.

Goldberg, P. and N. Pavcnik (2003), "The Response of the Informal Sector to Trade Liberalization."

Goldberg, P. and N. Pavcnik (2004), "Trade, Inequality, and Poverty: What Do We Know? Evidence from Recent Trade Liberalization Episodes in Developing Countries", NBER Working Paper 10593.

Heckman, J. and C. Pages (2003), "Law and Employment: Lessons from Latin America and the Caribbean," NBER Working Paper 10129.

Inter American Development Bank (1997), Latin America After a Decade of Reforms, Economic and Social Progress Report, Johns Hopkins University Press, Baltimore.

Kanbur (2001).

Krueger, A. and L. Summers (1988), "Efficiency Wages and Inter-Industry Wage Structure", Econometrica 56(2): 259-293.

LAC Labor Team (2004), "Pending Issues in Protection, Productivity Growth, and Poverty Reduction", Mimeo, Washington, DC: World Bank.

Leamer, E. (1995), The Heckscher-Ohlin Model in Theory and Practice, International Finance Section, Department of Economics, Princeton University, Princeton, N.J.

Lora and Barrera (1997)

Morley, S. (2001), "The income distribution problem in Latin America and the Caribbean", Santiago: Economic Commission for Latin America and the Caribbean.

Nicita, A. (2005), "Multilateral Trade Liberalization and Mexican Households : The Effect of the Doha Development Agenda," Policy Research Working Paper 3707, World Bank, Washington, DC.

Rodríguez, F. and D. Rodrik (2001), "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence", in Macroeconomics Annual 2000, B. Bernanke and K. Rogoff (Ed.), MIT Press for NBER, Cambridge, MA.

Slichter, S. (1950), "Notes on the structure of wages", Review of Economics and Statistics, 33(1): 80-91.

Stallings and Peres (2000)

Székely, M. (2001), "The 1990s In Latin America: Another Decade Of Persistent Inequality, But With Somewhat Lower Poverty", Inter-American Development Bank Working Paper 454, Washington, D.C.

Székely, M. et al. 2004

van der Mensbrugghe, Dominique. 2005. "The LINKAGE Model—Technical Documentation." Washington, DC: World Bank.

Winters, L. A., N. McCulloch and A. McKay (2004), "Trade Liberalization and Poverty: The Evidence So Far", Journal of Economic Literature 42(1): 72-115.

Wodon and Maloney (2000)

World Bank. 2004. *Global Economic Prospects 2005: Trade, Regionalism, and Development.* Washington, DC: World Bank.

6 Annexes

Since the space constraints on the main body of the paper prevent us from discussing the detailed CGE and micro-simulation setup and implementation, we present them in this annex. The following text is organized as follows: the first section covers the setup of the micro-model, the second section presents the initial sectoral allocation and structure of protection and introduces the simulation scenarios, while the third and fourth sections discuss the macro and micro results of the low and high mobility model versions, respectively.

6.1 Micro Model Setup

The household surveys and the CGE model are linked sequentially by a set of aggregate variables. We derive the nature of these links by starting with a household's indirect utility function, which is a function of income y_h and of a vector of goods prices $\boldsymbol{p}$[22]:

$$v_h = v_h(y_h, \mathbf{p}) \tag{1}$$

Totally differentiate (1):

$$dv_h = \frac{\partial v_h}{\partial \mathrm{p}} d\mathrm{p} + \frac{\partial v_h}{\partial y_h} dy_h \tag{2}$$

Dividing both sides by the marginal utility of income $\left(\partial v_h / \partial y_h\right)$ and using Roy's identity, we obtain:

$$\frac{1}{\partial v_h / \partial y_h} dv_h \equiv dw_h = -\left(\sum_g c_{h,g} dp_g \right) + dy_h \tag{3}$$

where dw_h is the monetary value of the change in indirect utility, $c_{h,g}$ is the consumption of good g by household and dp_g is the change in price of good g. Income of household h is given by the sum of labor income, remittances (which are a function of wages), profits associated with production of a particular good and income obtained through government transfers (partly tariff revenue):

$$y_h = \underbrace{w\ell_h}_{\textit{labor}\ \text{income}} + \underbrace{R_h(w)}_{\textit{remit}\ \text{tan}\ \textit{ces}} + \underbrace{\pi\ Kap_h}_{\textit{profits}} + \underbrace{G_h + \phi_h \sum_g t_g\, p_g^w m_g}_{\textit{government}\ \text{transfers}} \tag{4}$$

where w is the wage rate, l_h is the (net) amount of labor sold in the market by household h; R_h are remittances received by household h, π is the rental rate and Kap_h is the amount of land or other physical capital owned by the household (and used in the household production of goods directly sold in the market); G_h are government transfers to household h not associated with tariff revenue, φ_h is the share of tariff revenue redistributed to household h and the sum that follows is the tariff revenue collected over all goods g .

To be consistent with the CGE model we make the following two assumptions: i) households choose optimally the amount of labor to sell in the labor market; ii)

[22] The following formalization is just an adaptation of that found in Nicita and Olarreaga (2004) "Trade, Trade reforms and Poverty in Ethiopia".

households choose optimally the amount to produce in their own business. We also assume that trade reform is neutral with respect to remittances and total government transfers—that is, any change in $R_h(w)$ and/or $\phi_h \sum_g t_g p_g^w m_g$ is offset by an equal change in G_h so that household income remains constant with respect to these variables. Then, differentiating (4) using Hotelling's Lemma and the Envelope theorem yields:

$$dy_h = dw\ell_h + d\pi K_h \tag{5}$$

Substitute equation (5) into (3), divide everywhere by income of household h assuming that income equals expenditure, and rearrange terms to obtain:

$$\frac{dw_h}{y_h} = \underbrace{\sum_g -\theta_{h,g}^c \dot{p}_g}_{consumption} + \underbrace{\theta_h^\ell \dot{w}}_{labor\ \text{income}} + \underbrace{\theta_h^{kap} \dot{\pi}}_{profits} \tag{6}$$

where a "dot" on top of the variable expresses percentage changes; $\theta_{h,g}^c = p_g c_{h,g} / y_h$ is the share of expenditure (or income) spent on good g by household h; $\theta_h^\ell = w\ell_h / y_h$ is the share of income spent obtained in the labor market by household h; θ_h^{kap} is the share of income of household h obtained from running the household business.

Because we are interested on the impact of tariff reforms on the welfare of poor households, to apply equation (6) we need the changes in p_g, w and π_h that follow a trade reform and these are given by the general equilibrium prices obtained in the CGE. Notice also that the estimates obtained by using equation (6) take into account only first order effects. Indeed household substitute goods in their consumption bundle, enter and exit the factor markets, and, therefore, full effects should also consider changes in the shares θ_h^{kap} $\theta_{h,g}^c, \theta_h^\ell$ (but these require a fully blown micro-simulation model). In order to express the change in welfare in monetary units, one simply needs to multiply the expression in (6) by household income; the usual estimates of poverty effects are then straightforward.

Specifically, the CGE model provides us with the following variables: the average real wage in each labor market segment, the average non-agricultural real capital rent, the average agricultural capital and land rent, and the relative price of food and non-food commodities. Following equation (6), these changes are used to shock the micro data so that a new full income distribution is obtained. This method thus takes the results from the CGE and scales up the different components of household income accordingly. When available, we also took account of auto-consumption, which was included in transfers and therefore remained constant.

The migration module of the micro-simulation model is meant to mirror the movement of labor across segments given by the CGE migration function:

$$MIGR_{unsk} = \chi \left(\frac{w_{unsk,Non-farm}}{w_{unsk,Farm}} \right)^{\omega_{unsk}} \tag{7}$$

The micro-model uses the CGE-determined changes in labor segments to adjust the populations of labor segments in the survey. In each scenario, migration takes place

before trade-related changes in factor and goods prices are passed on to the household surveys. To allow for movement of people, households in the shrinking segments are ranked in a random order, and the segments' population is reduced by the relevant share. Similarly, the population of expanding sectors is increased by the stock of new migrants, so that the percentage growth in the segments' population matches the increase given by the CGE model.

The incomes of migrants and natives in each segment are determined through a two-step process. First, the migrants receive an income boost equal to the inter-segment wage gap:

$$w^1_{unsk} = w^0_{unsk}\left(\frac{\mu(w_{unsk,Non-farm})}{\mu(w_{unsk,Farm})}\right) \quad (8)$$

Then, the wages of both the migrants and the natives are adjusted so that the average wage in each segment remains equal to the average wage before migration:

$$w^2_{unsk,ll} = w^1_{unsk,ll}\left(\frac{\mu(w^0_{unsk,ll})}{\mu(w^1_{unsk},ll)}\right); ll \in (Non-farm, Farm) \quad (9)$$

where for the natives $w^0 = w^1$.

6.2 Economic structure and composition of tariffs

The structural features of Brazil, Chile, Colombia, and Mexico, as well as the patterns of protection facing their importers and exporters are presented in Table 15 and Table 16. In general, tariffs levied against Western hemisphere trading partners are somewhat lower than tariffs levied against non-Western hemisphere exporters, mostly due to preferences granted under the region's many preferential trade agreements. This is particularly evident in the case of Mexico, whose import-weighted tariffs on merchandise trade with Western hemisphere partners are slightly more than a tenth of its tariffs on trade with countries outside the region. This also suggests that preferential liberalization in Mexico (mainly NAFTA) has been taking place behind relatively high external barriers. It is also noteworthy that for Brazil, tariffs on agriculture and food commodities are much lower than on manufactured goods, while the opposite is true for Mexico. Chile's tariff structure is largely uniform across different sectors, and the level of duties is, on average, lower than other Latin American countries. These tariff patterns are also reflected in the structural features of the four economies: exports and imports figure most prominently in the GDP of Chile and Mexico, the two countries with the lower average tariffs.

Each scenario (FTAA, full liberalization, Doha, and Western Hemisphere customs union) has been modeled separately in a comparative static framework. Prior to implementing the liberalization scenarios, a series of pre-simulation shocks were imposed on the model to both provide a better starting point for the solution and reflect the global trading environment more carefully. These shocks include, for example, the phase-out of the MFA/ATC quotas as well as China's accession to the WTO. Having obtained a solution for this "pre-simulation," the model uses it as a starting point for each of the liberalization scenarios. At the end of the solution period, all model variables are re-initialized to the pre-simulation starting point, and a new liberalization scenario is solved.

6.3 Macro and poverty results—low mobility

We begin by presenting the CGE results and their poverty outcomes for the low-mobility case. Since the model is solved in a comparative static mode and factor mobility is restrained, the adjustment process after the trade liberalization shock is carried out almost entirely through price changes. First, we examine sectoral adjustments, summarized in Table 17.

Consider the FTAA scenario for Brazil, Chile, and Mexico. Recall that for Western hemisphere partners, Brazil's tariffs are significantly biased against manufactured goods while the converse is true for Mexico, and Chile's tariffs are largely uniform across sectors. Following liberalization, the most heavily protected sectors experience the greatest increase in import volumes. Consequently, in Brazil manufacturing imports rise the most, while in Mexico it is the agricultural sector that experiences the largest growth in import volumes. In the case of Chile, the effect is largely the same across agriculture and manufacturing. This pattern of increased import inflows is also borne out in the behavior of prices of domestic goods sold locally: in Brazil, the largest price declines are observed in manufacturing sectors, while in Mexico it is the prices of agricultural commodities that register the greatest changes. This behavior testifies to the market share losses experienced by domestic producers as a result of tariff reform.

Turning to the exports side, we notice that the sectors with the largest increase in import volumes are generally also sectors with the greatest increase in exports volumes. This reflects greater incentives to export through lower domestic producer prices. The export response varies across sectors and is generally linked to the structure of each country's comparative advantage, revealed partly in the exports-to-GDP ratio in Table 16. Thus for Brazil, who exports more than half of its production of other manufactures, the increase in exports volume more than offsets the decrease in domestic prices, leading to an overall expansion in sectoral production. On the other hand, Mexico, who exports a relatively low share of its production of agricultural goods, is unable to compensate for the fall in prices with rising export sales, and consequently experiences a contraction in that sector. In general, the sectoral adjustments brought about by FTAA reform are quite modest. This is likely due to the already low tariffs on most imports from Western hemisphere trading partners.

The post-simulation adjustments in main factor and consumption prices, as well as real income changes, are summarized in Table 18. In all simulations, Brazil and Chile experience an increase in the payments to unskilled farm workers and a decrease in the skilled/unskilled wage gap for the agricultural sector. In Colombia, unskilled agricultural labor gains only in the case of multilateral liberalization, while in Mexico, unskilled agricultural workers lose in all cases except the Doha scenario. These results are consistent with the structure of individual simulations, and differences across countries reflect their particular patterns of protection and comparative advantage. For example, Brazil's comparative advantage lies in agricultural products and it tends to protect its manufacturing sectors more than the others. Consequently, trade reform leads to an expansion in production of agricultural goods, and, since labor is not able to move

between agricultural and non-agricultural activities, wages in the farm sectors increase significantly. On the other hand, domestic prices decline in the previously protected manufacturing sectors, which reduces production and wages in that sector. The same effect takes place in Mexico, only with the sectoral roles reversed—since Mexico's agriculture is relatively more protected, farm wages suffer vis-à-vis non-farm earnings. The case of Mexico is particularly interesting because, in addition to the aforementioned price effect, another phenomenon takes place—preference erosion. Within each of the four liberalization scenarios above, Mexico loses the significant margin of preference it enjoys as a NAFTA member with respect to other Latin American countries. This is one of the reasons why Mexico's non-farm wages do not experience a significant increase—it already enjoys virtually tariff-free access to its biggest market, USA and Canada, and further regional or global liberalization only serves to open the North American markets for its competitors.

While the factor price changes discussed above determine the incomes of the poor, we cannot draw poverty implications from changes in earnings without considering the adjustment process of consumption prices. As an example, a decline in rural unskilled wages will not be poverty-increasing as long as consumption price changes can compensate the poor for their reduced purchasing power. Therefore, a household's post-simulation real income is calculated at the new factor prices and deflated by the new prices of food and non-food items (the latter are weighted by each household's consumption share of these products). The micro-simulation results are summarized in Table 19.

In Brazil and Chile, aggregate poverty declines across all scenarios and the reduction in farm and non-farm headcounts is in line with the factor price changes of Table 18. In Colombia, the aggregate poverty effects of all simulations are quite small,[23] but again, the results are consistent with factor and consumption price changes given by the macro model (however in all cases, the decline in farm poverty is significant). The most interesting dynamics are observed when comparing the impact of multilateral and regional liberalization across countries. For Brazil, multilateral liberalization is unequivocally superior to regional scenarios, and the order of magnitude of poverty reductions is proportional to the scale of tariff reductions. For Chile, who has preferential trade agreements with a number of countries within and outside the region, the full liberalization scenario is still the most poverty-reducing, but the Doha formula (which implements limited tariff reductions) is inferior to the regional elimination of tariffs. The poverty outcomes of the two regional scenarios for Chile are extremely similar, since in the customs union simulation its own tariffs hardly change and the only additional liberalization takes place in the tariff schedules of its LAC trading partners. For Mexico, only the regional liberalization scenarios are poverty-reducing, while multilateral liberalization actually increases poverty. The reason for this result is the previously mentioned preference erosion—with regional liberalization, Mexico only loses its preference margin vis-à-vis other LAC countries, while with multilateral liberalization, it

[23] Although the initial level of poverty in Colombia is much higher than the other countries under consideration—therefore, a smaller percentage decrease in the poverty headcount represents a larger nominal reduction.

is now forced to compete with all of the US and Canada's trading partners. The differences between the two regional scenarios show that Mexico can generate significant poverty reduction in the non-farm sector through own liberalization.

6.4 Macro and poverty results—high mobility

The above results show that trade can be poverty-reducing, but this result does not hold in all instances. For example, poverty in Mexico increases under the full liberalization and Doha scenarios. Similarly, poverty reductions in Chile are quite modest—despite the fact that factor prices undergo a significant adjustment. In order to gain a better understanding of the reasons why trade shocks, while pro-poor in nature, may not translate into significant poverty reduction, we relax the segmented labor assumption of the CGE model and allow individuals to switch from farm to non-farm activities in response to demand shocks. The migration function is calibrated to a base level of migration, so that when demand for agricultural activities increases, migration from farm to non-farm activities is reduced. The results with respect to the macro variables of the model are presented in Table 20.

Comparing the results of Table 20 with Table 18, we notice that factor price changes are considerably smaller because increases in labor demand are met not only through wage adjustments but also through growth in the stock of labor due to inter-segment migration. At first glance, this would seem to bear negative implications for poverty, since wages in the unskilled agricultural sector do not increase as much as before. However, this may not be the case if the muted growth in factor prices is more than offset by the increased incomes of the individuals who move from farm to non-farm activities. In order to determine which effect dominates, we pass on the changes in factor and consumption prices to the households surveys while simultaneously allowing individuals to switch sectors based on the target sectoral allocation matrix given by the CGE model. Therefore, changes in the stock of workers in each segment at the macro level are mirrored by individuals switching sectors at the micro level, and the individuals who move are allowed to improve their earnings by the inter-segment wage differential. The micro-simulation results are shown in Table 21.

It turns out that the non-farm wage premium is indeed enough to compensate for smaller wage increases in the farm sector. Across all countries, the reduction in poverty is much more pronounced than in the low mobility case. For Mexico, even the sign of the effect switches—trade reform becomes poverty-reducing instead of poverty-increasing. These results show that labor market flexibility is a key element in transmitting trade shocks to the income distribution, and relaxing labor market constraints can generate and amplify trade-induced poverty reduction.

7 Figures

Figure 1: Latin America's poverty headcount and trade to GDP ratios (%)

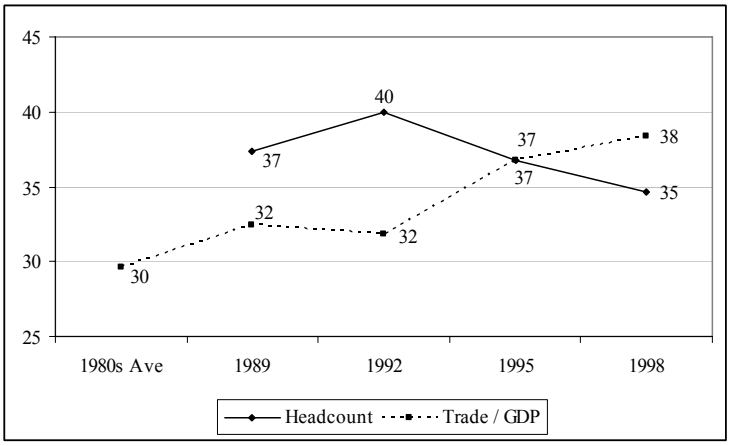


Figure 2: Congruence of partial reform with global free trade

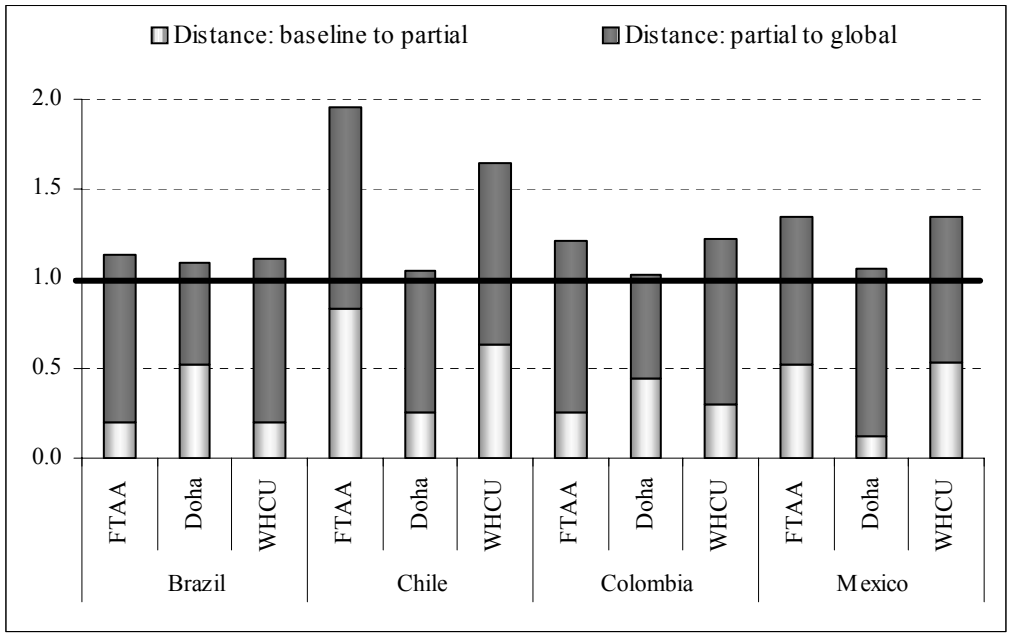
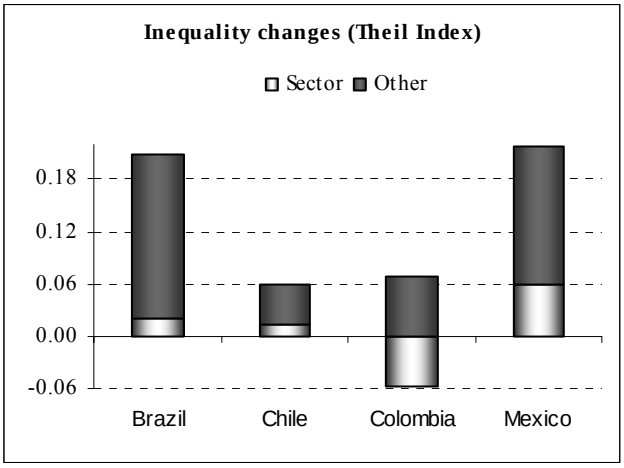


Figure 3: Inequality – sectoral affiliation simulations



8 Tables

Table 1: Factor content of US$1 increase in the value of trade (cent) – direct coefficients

			Unskilled	Skilled	Capital	Land	Nat.
Direct coef.	Argentina	Exports	16.44	3.93	13.18	3.11	1.42
		Imports	15.04	6.02	13.94	0.25	0.09
		Net	**1.40**	**-2.09**	**-0.76**	**2.86**	**1.32**
	Brazil	Exports	11.75	3.67	14.85	0.93	0.15
		Imports	12.17	4.94	14.48	0.22	0.48
		Net	**-0.42**	**-1.27**	**0.38**	**0.72**	**-0.32**
	Chile	Exports	11.33	2.66	22.15	1.50	0.00
		Imports	7.19	2.77	12.94	0.31	0.03
		Net	**4.13**	**-0.11**	**9.21**	**1.20**	**-0.03**
	Colombia	Exports	16.63	3.76	17.97	3.04	4.69
		Imports	14.25	4.57	10.72	0.90	0.05
		Net	**2.38**	**-0.81**	**7.25**	**2.14**	**4.63**
	Mexico	Exports	7.01	1.92	21.06	0.52	1.10
		Imports	7.32	2.21	22.12	0.52	0.37
		Net	**-0.31**	**-0.28**	**-1.06**	**0.00**	**0.73**
	Peru	Exports	9.74	3.10	30.69	1.09	0.17
		Imports	7.83	3.41	31.91	0.96	0.44
		Net	**1.91**	**-0.31**	**-1.22**	**0.14**	**-0.27**
	Uruguay	Exports	11.18	3.20	21.04	1.19	
		Imports	8.92	2.68	14.82	0.39	
		Net	**2.26**	**0.53**	**6.22**	**0.80**	
	Venezuela	Exports	7.34	1.95	29.77	0.09	13.61
		Imports	10.89	3.35	14.33	0.58	0.00
		Net	**-3.55**	**-1.40**	**15.44**	**-0.49**	**13.61**
	Centr. Am.	Exports	12.87	3.59	15.61	2.57	0.01
		Imports	6.55	1.82	11.33	0.44	0.06
		Net	**6.32**	**1.76**	**4.28**	**2.13**	**-0.06**
	EAP	Exports	9.04	2.05	11.42	0.48	0.32
		Imports	8.83	2.44	11.96	0.51	0.42
		Net	**0.21**	**-0.39**	**-0.55**	**-0.03**	**-0.10**
	SAS	Exports	13.58	3.56	16.65	1.86	0.10
		Imports	10.27	2.91	16.44	1.62	0.99
		Net	**3.31**	**0.65**	**0.22**	**0.25**	**-0.89**

Note: Land is used in the following sectors only: cereals, oil seeds, sugar, fruits and vegetables, other crops, and livestock; Natural resources are used only in the fossil fuels sector (which includes coal, oil, and gas extraction, as well as petrochemicals)

Table 2: Factor content of US$1 increase in the value of trade (cent) – total coefficients

			Unskilled Labor	Skilled Labor	Capital	Land	Nat. Resources
Total coef.	Argentina	Exports	87.07	36.57	88.04	6.53	3.13
		Imports	73.75	33.74	76.73	2.19	1.02
		Net	**13.32**	**2.83**	**11.31**	**4.34**	**2.11**
	Brazil	Exports	54.00	27.16	59.80	2.24	0.97
		Imports	49.59	26.08	53.71	1.06	1.44
		Net	**4.41**	**1.08**	**6.09**	**1.19**	**-0.47**
	Chile	Exports	39.38	14.79	77.77	4.44	0.03
		Imports	23.73	10.19	45.57	1.83	0.07
		Net	**15.64**	**4.60**	**32.20**	**2.61**	**-0.04**
	Colombia	Exports	68.90	25.53	61.45	7.42	7.47
		Imports	53.59	20.76	42.23	4.24	0.97
		Net	**15.32**	**4.77**	**19.23**	**3.18**	**6.50**
	Mexico	Exports	28.29	11.82	90.03	2.11	2.37
		Imports	29.06	12.25	92.03	2.25	1.44
		Net	**-0.77**	**-0.43**	**-1.99**	**-0.14**	**0.93**
	Peru	Exports	44.97	19.76	126.09	6.61	0.98
		Imports	36.59	17.46	113.27	5.48	1.27
		Net	**8.37**	**2.30**	**12.82**	**1.13**	**-0.29**
	Uruguay	Exports	52.91	17.81	108.31	7.37	
		Imports	37.14	12.96	75.82	3.78	
		Net	**15.78**	**4.84**	**32.49**	**3.60**	**0.00**
	Venezuela	Exports	55.34	22.11	115.81	4.10	19.21
		Imports	47.71	18.34	74.74	3.98	0.94
		Net	**7.63**	**3.77**	**41.07**	**0.13**	**18.27**
	Centr. Am.	Exports	43.93	16.02	54.61	5.77	0.08
		Imports	27.30	10.07	37.88	2.48	0.13
		Net	**16.62**	**5.95**	**16.73**	**3.29**	**-0.06**
	EAP	Exports	35.46	8.60	42.71	5.06	1.27
		Imports	34.22	8.90	42.57	4.74	1.46
		Net	**1.24**	**-0.31**	**0.14**	**0.32**	**-0.19**
	SAS	Exports	66.70	19.11	80.05	21.48	1.17
		Imports	54.53	16.19	71.99	17.56	2.52
		Net	**12.17**	**2.91**	**8.05**	**3.93**	**-1.34**

Note: Land is used in the following sectors only: cereals, oil seeds, sugar, fruits and vegetables, other crops, and livestock; Natural resources are used only in the fossil fuels sector (which includes coal, oil, and gas extraction, as well as petrochemicals)

Table 3: Households' incomes by source, segment and poverty status (%)

		Farm			Non-farm				
		skilled	**unskill**	**capital**	**Skilled**	**unskill**	**Capital**	**transfer**	**food %**
Brazil	**All**	0	9	2	15	46	8	20	30
	Poor-Urban	0	12	1	4	64	7	12	28
	Poor-Rural	1	63	8	1	16	4	7	40
	Non-Poor-Urban	0	2	1	21	49	9	18	28
	Non-poor-Rural	3	35	11	5	21	3	23	40
Chile	**All**	0	18	3	8	34	7	31	38
	Poor-Urban	0	9	0	3	52	2	35	32
	Poor-Rural	0	41	1	1	22	0	36	46
	Non-Poor-Urban	0	3	1	18	43	12	23	32
	Non-poor-Rural	1	36	7	3	24	4	25	46
Colombia	**All**	0	14	4	8	39	7	27	46
	Poor-Urban	0	4	1	4	63	8	21	45
	Poor-Rural	0	36	9	1	18	1	35	57
	Non-Poor-Urban	0	1	1	20	46	14	18	30
	Non-poor-Rural	0	23	12	10	26	6	22	48
Mexico	**All**	0	10	2	8	41	4	35	37
	Poor-Urban	0	6	0	3	60	2	29	41
	Poor-Rural	0	32	1	1	20	1	45	48
	Non-Poor-Urban	0	1	0	18	45	7	29	27
	Non-poor-Rural	0	16	5	5	32	5	37	36

Source: Authors' calculations from households surveys. Note: transfers include auto-consumption and the last column 'food %' represents the share of food items in the consumption basket.

Table 4: Poverty initial levels and percent changes due to trade shocks (by labor mobility)

Poverty headcount		**Brazil**	**Chile**	**Colombia**	**Mexico**
Absolute levels					
Initial	**All**	23.5	21.0	60.7	50.2
	Non-farm	22.0	20.9	59.2	48.4
	Farm	38.7	23.2	78.2	72.4
Percent changes from initial levels		***Low mobility***			
FTAA	**All**	-0.6	-1.8	-0.2	-0.3
	Non-farm	-0.5	-1.7	-0.2	-0.5
	Farm	-1.7	-3.7	-0.2	1.0
Full Lib	**All**	-6.0	-4.4	-0.2	1.2
	Non-farm	-2.6	-3.4	0.3	1.1
	Farm	-24.5	-20.6	-4.0	1.4
Doha	**All**	-1.1	-0.6	0.3	0.2
	Non-farm	0.2	-0.4	0.5	0.2
	Farm	-8.3	-4.3	-1.8	-0.2
WHCU	**All**	-1.0	-1.8	-0.4	-0.8
	Non-farm	-0.7	-1.7	-0.3	-1.0
	Farm	-2.5	-3.8	-0.7	1.0
Percent changes from initial levels		***High mobility***			
FTAA	**All**	-3.8	-2.4	-1.7	-1.5
	Non-farm	-2.6	-2.2	-1.2	-1.1
	Farm	-10.4	-6.2	-5.3	-5.2
Full Lib	**All**	-5.2	-4.5	-1.5	-0.2
	Non-farm	-2.6	-3.6	-0.9	0.3
	Farm	-19.7	-18.3	-6.9	-4.7
Doha	**All**	-3.1	-1.2	-1.2	-1.3
	Non-farm	-1.3	-0.9	-0.7	-0.8
	Farm	-12.6	-6.3	-5.6	-5.7
WHCU	**All**	-4.0	-2.4	-1.7	-2.3
	Non-farm	-2.8	-2.2	-1.3	-2.0
	Farm	-10.8	-6.3	-5.3	-5.6

Table 5: Income elasticity of poverty headcount

	Growth Elasticity	Trade Elasticity		
		Scenario	Mobility	
			Low	High
Brazil	-1.0	FTAA	-1.5	-3.4
		WHCU	-1.5	-3.1
		FULL LIB	-12.7	-5.9
Chile	-1.6	FTAA	-1.8	-2.2
		WHCU	-2.0	-2.3
		FULL LIB	-4.1	-3.4
Colombia	-0.5	FTAA	-0.3	-1.0
		WHCU	-0.4	-1.0
		FULL LIB	-0.7	-1.3
Mexico	-1.0	FTAA	0.3	-1.7
		WHCU	-0.7	-1.3
		FULL LIB		

Source: Author calculations combining CGE model results with micro-simulation results. Note that Mexico's full liberalization trade elasticities are not reported because average growth rates are negative.

Table 6: Inter-sectoral mobility and poverty headcount

	Scenario	Trade Elasticity: High Mobility	
		Migr+Prices	Prices only.
Brazil	FTAA	-3.39	-1.28
	WHCU	-3.08	-1.32
	FULL LIB	-5.85	-7.13
Chile	FTAA	-2.15	-1.76
	WHCU	-2.34	-1.97
	FULL LIB	-3.42	-3.31
Colombia	FTAA	-1.05	-0.36
	WHCU	-1.01	-0.41
	FULL LIB	-1.30	-0.83
Mexico	FTAA	-1.74	1.88
	WHCU	-1.26	-0.61
	FULL LIB		

Table 7: Aggregate poverty results for Brazil, Chile, Colombia, and Mexico

	All	Non-farm	Farm
Initial poverty			
Thousands	115,157	101,419	13,738
Headcount (%)	36.3	34.9	52.1
FTAA poverty reduction			
Thousands	2,689	1,661	1,028
Percent of initial poor	2.3	1.6	7.5
Full liberalization poverty reduction			
Thousands	2,659	1,053	1,606
Percent of initial poor	2.3	1.0	11.7

Table 8: Poverty regression results (dependent variable = distance from the poverty line)

	Urban				Rural			
	Brazil	Chile	Colombia	Mexico	Brazil	Chile	Colombia	Mexico
Individual characteristics								
Age--head	0.015***	0.018***	0.009***	0.004***	0.02***	0.017***	0.001	0.003***
Age--spouse	-0.001***	-0.002***	-0.002	-0.001**	0	-0.002***	-0.005***	-0.002*
Primary education -- head	0.477***	0.214***	0.327***	0.284***	0.355***	0.184***	0.426***	0.215***
Secondary education -- head	0.787***	0.568***	1.201***	0.627***	0.743***	0.574***	1.156***	0.671***
Tertiary education -- head	1.447***	1.099***	1.554***	1.034***	1.275***	1.157***	2.984***	1.272***
Primary education -- spouse	0.111***	-0.122***	-0.012	-0.08**	0.203***	-0.099***	0.175**	-0.001
Secondary education -- spouse	0.305***	-0.009	0.372***	0.124***	0.434***	0.058***	0.899***	0.053
Tertiary education -- spouse	0.662***	0.349***	0.617***	0.375***	0.763***	0.483***	0.419	0.552***
Self-employed--head	0.25***	0.519***	0.082	-0.049	0.285***	0.53***	0.306**	0.186**
Wage-worker -- head	0.123***	0.157***	0.188**	-0.109***	0.246***	0.32***	0.278*	0.057
Unemployed-head	-0.633***	-0.607***	-0.512***	-0.291***	-0.319***	-0.553***	-0.055	-0.181
Self-employed--spouse	0.213***	0.015***	0.227***	0.069**	0.157***	0.015***	0.323***	0.083**
Wage-worker -- spouse	0.203***	0.011***	0.343***	0.138***	0.316***	0.011***	0.403***	0.18***
Unemployed-spouse	-0.312***	-0.268***	-0.383**	0.181	-0.272***	-0.24***	-0.437	-0.482
Household characteristics								
Number of infants	-0.403***	-0.253***	-0.269***	-0.229***	-0.304***	-0.269***	-0.244***	-0.18***
Number of childred	-0.316***	-0.262***	-0.301***	-0.265***	-0.263***	-0.244***	-0.247***	-0.239***
Number of adults	-0.116***	-0.091***	-0.015	-0.088***	-0.135***	-0.096***	0.005	-0.086***
Female head	-0.22***	-0.111***	-0.203***	-0.057*	-0.151***	-0.14***	-0.324***	-0.112**
Sectoral characteristics								
Sector 1	-0.41***	-0.097***	-0.447***	-0.298***	-0.264***	-0.191***	-0.153	-0.316***
Sector 2	-0.265***	0.061***	0.047	0.234***	-0.126***	-0.02	0.177	0.134
Sector 3	-0.187***	-0.066***	-0.116	-0.136***	-0.028	-0.133***	0.238	-0.125
Sector 4	0.114***	0.138***	0.587***	-0.034	0.228*	0.007	0.142	0.008
Sector 5	0.078***	-0.051*	0.721***	0.033	0.085	-0.033	-0.021	0.059
Sector 6	-0.054***	0.118***	0.122*	-0.045	0.21***	-0.142***	0.405***	-0.021

Notes. 1) The dependent variable in each regression is the natural logarithm of the ratio of household per capita income to the relevant poverty line (either rural or urban). Coefficient significance at the 1%, 5%, and 10% levels is denoted by three, two, and one stars, respectively. 2) Only six out of a larger set of the sectoral dummies are shown here and they are different for each country. Brazil: 1=cereal grains, 2=other crops, 3=animal products, 4=oil and chemicals, 5=machinery, 6=construction. Chile: 1=agriculture, 2=beverages, tobacco, fruits, 3=construction, 4=fossil fuels, 5=other foods, 6=other natural resources. Colombia: 1=agriculture, 2=other natural resources, 3=other foods, 4=fossil fuels, 5=metals, 6=construction. Mexico: 1=agriculture, 2=mining, 3=construction, 4=commerce, 5=transport, 6=general services. Reference sectors: Brazil-public administration, Chile-general services, Colombia-general services, Mexico-government services.

Table 9: Cost of Labor market regulations

Country	Year	Advance Notice (EPV)	Indemnities for dismissal (EPV)	Seniority pay (EPV)
Argentina	1999	0.80	2.20	0.00
Bolivia	1999	1.77	2.99	0.00
Brazil	1999	0.59	2.45	9.82
Chile	1999	0.59	2.79	0.00
Colombia	1999	0.30	3.49	9.82
Costa Rica	1999	1.05	2.60	0.00
Dominican Rep.	1999	0.59	2.16	0.00
Ecuador	1999	0.59	3.30	9.82
El Salvador	1999	0.06	2.99	0.00
Honduras	1999	0.59	2.94	0.00
Jamaica	1999	0.59	1.41	0.00
Mexico	1999	0.59	2.57	0.00
Nicaragua	1999	0.59	1.97	0.00
Panama	1999	0.59	2.09	0.75
Paraguay	1999	0.68	1.49	0.00
Peru	1999	0.00	3.80	9.82
Trinidad & Tobago	1999	1.18	1.33	0.00
Uruguay	1999	0.00	2.23	0.00
Venezuela	1999	0.93	2.03	5.97
Avg. LAC	1999	0.63	2.46	2.42
USA	1999	0.00	0.00	0.00
Avg. OECD	1999	0.89	0.82	0.00

Source: Heckman and Pages (2003). Note: the columns show the costs associated with different labor regulations in terms of expected present discounted values of monthly wages.

Table 10: Compliance with labor market regulations

	% of Workers affiliated with mandatory Social Security programs		% of Workers 25-40 years old with net earnings below minimum wage
Country	% of Total Employment	% of Wage Employment	Non Compliance with Min Wages
Avg. LAC	39.4	60.1	10.1
Argentina	48.5	66.6	3.1
Bolivia	26.4	38.6	1.1
Brazil	48.2	64.0	5.8
Chile	64.5	77.5	7.3
Colombia	46.1	66.8	26.9
Costa Rica	65.9	74.6	15.7
Dominican Rep.	29.1	49.4	NA
Ecuador	30.9	43.0	NA
El Salvador	33.5	50.0	3.6
Mexico	52.5	68.0	0.5
Panama	55.7	74.5	14.8
Paraguay	16.7	30.7	NA
Peru	18.0	51.9	23.5
Uruguay	74.1	93.1	0.5
Venezuela	31.4	52.2	17.9

Source: Heckman and Pages (2003). Note: Avg. LAC is an un-weighted average

Table 11: Mincerian estimates for wage workers and self-employed

	Brazil	Chile	Colombia	Mexico
Self-employed				
Individual characteristics				
Primary education	0.616***	0.34***	0.759***	0.457***
Secondary education	1.066***	0.861***	1.844***	1.296***
Tertiary education	1.873***	1.621***	2.187***	1.777***
Experience	0.058***	0.043***	0.06***	0.061***
Experience squared	-0.001***	-0.001***	-0.001***	-0.001***
Gender	-0.55***	0.468***	-0.776***	1.203***
Urban	0.199***	0.114***	0.218***	0.327***
Regional characteristics				
Region 1	-0.173***	-0.224***	-0.387***	0.426***
Region 2	-0.4***	-0.168***	-0.388***	0.279***
Region 3	-0.038***	-0.145***	-0.206***	0.654***
Sectoral characteristics				
Sector 1	-0.908***	-0.305***	0.203*	-0.56*
Sector 2	-0.661***	0.121**	1.25***	-
Sector 3	-1.335***	-0.116***	-0.363***	0.079
Sector 4	0.075*	-0.472***	-0.334**	0.263
Sector 5	-0.137***	-0.178***	0.267*	0.402
Sector 6	-0.237***	-0.238***	0.167***	0.236
Wage worker				
Individual characteristics				
Primary education	0.554***	0.179***	0.451***	0.353***
Secondary education	0.956***	0.638***	1.444***	1.004***
Tertiary education	1.615***	1.344***	1.901***	1.628***
Experience	0.07***	0.034***	0.068***	0.062***
Experience squared	-0.001***	0***	-0.001***	-0.001***
Gender	-0.343***	0.343***	-0.149***	0.386***
Urban	0.09***	0.034***	0.126***	0.324***
Regional characteristics				
Region 1	-0.131***	-0.051***	-0.236***	0.175***
Region 2	-0.448***	-0.219***	-0.018	0.146***
Region 3	-0.083***	-0.186***	-0.356***	0.433***
Sectoral characteristics				
Sector 1	-0.836***	-0.092***	0.12	-0.512***
Sector 2	-0.567***	0.046***	0.7***	0.173***
Sector 3	-0.28***	0.011	-1.771***	-0.09***
Sector 4	-0.257***	-0.021	0.371***	-0.179***
Sector 5	-0.153***	0.015	-0.107	-0.266***
Sector 6	-0.275***	0.117***	0.205***	-0.248***

Notes. 1) The dependent variable in each regression is the natural logarithm of individual labor earnings. Coefficient significance at the 1%, 5%, and 10% levels is denoted by three, two, and one stars, respectively. 2) Only six out of a larger set of the sectoral dummies are shown here and they are different for each country. Brazil: 1=cereal grains, 2=other crops, 3=animal products, 4=mining, 5=machinery, 6=construction. Chile: 1=agriculture, 2=beverages, tobacco, fruits, 3=construction, 4=textiles and leather, 5=other foods, 6=other natural resources. Colombia: 1= other natural resources, 2= fossil fuels, 3=other manufacturing, 4=equipment manufacturing, 5=electricity and gas, 6=construction. Mexico: 1=agriculture, 2=mining, 3=manufacturing, 4= construction, 5=commerce, 6=general services. Reference sectors: Brazil-public administration, Chile-general services, Colombia-general services, Mexico-government services.

Table 12: Inequality simulations for salaried vs. self-employed workers in LAC

Theil Index		Brazil	Chile	Colombia	Mexico
Actual value	SE	0.89	0.85	0.84	0.90
	WW	0.53	0.54	0.82	0.49
Simulation using no residuals	SE	0.49	0.21	0.26	0.52
	WW	0.23	0.14	0.39	0.22
Simulation using WW independent vars	SE	0.37	0.19	0.45	0.36
Simulation using WW coeff's	SE	0.28	0.15	0.25	0.31
Simulation using WW sector vars	SE	0.26	0.15	0.33	0.25
Simulation using WW sector coeff's	SE	0.47	0.19	0.32	0.46

Table 13: Brazil two-stage estimation results

	Wage workers	Self-employed
Stage 1		
Education & experience		
Primary	0.521***	0.739***
Secondary	0.942***	1.246***
Tertiary	1.686***	2.058***
Experience	0.07***	0.059***
Experience squared	-0.001***	-0.001***
Individual characteristics		
Female	-0.346***	-0.762***
Preta	-0.138***	-0.296***
Amarela	0.149***	0.513***
Parda	-0.133***	-0.235***
Regional characteristics		
Region 1	-0.168***	-0.178***
Region 2	-0.386***	-0.455***
Region 3	-0.025***	-0.075***
Region 4	-0.059***	-0.083***
Isolated rural	0.027	0.008
Urban	0.148***	0.172***
Stage 2		
Tariff level	0.03***	0.028**
Constant	-0.358***	-0.377**
Note: *,**,*** indicate significance at 10,5,1 percent, respectively		

Table 14: Sectoral and regional composition of the CGE model

Regions	*Sectors*
Argentina	Cereals
Brazil	Vegetables and fruits
Chile	Oil seeds
Colombia	Sugar
Mexico	Other crops
Peru	Livestock
Uruguay	Other natural resources
Venezuela	Fossil fuels
Central America	Cattle meats
Caribbean	Dairy products
Rest of South America	Other food, beverages and tobacco
East Asia and Pacific	Textile
Europe and Central Asia	Wearing apparel
Middle East and North Africa	Leather products
South Asia	Basic manufactures
Sub Saharan Africa + ROW	Other manufacturing
Canada and US	Metals
Western Europe + EFTA	Motor vehicles and parts
Rest of high income	Other equipment
	Electric and gas utilities
	Construction
	Services

Table 15: Trade protection by origin, destination, and sector (import weighted 2001 tariff rates)

			Exporter							
Sector	**Importer**		whm	lac	bra	chl	col	mex	cus	xwh
Merchandise trade	Western hemisphere	whm	1.9	2.4	5.0	5.4	2.1	0.6	1.6	3.9
	Latin America and Carib.	lac	5.2	6.7	7.7	9.4	2.8	10.8	4.6	11.6
	Brazil	bra	8.3	6.1		8.0	10.3	16.4	9.8	10.7
	Chile	chl	6.4	6.3	7.0		7.0	0.0	6.7	6.5
	Colombia	col	8.5	7.4	13.4	14.2		11.5	9.3	12.1
	Mexico	mex	1.8	11.4	16.5	2.6	2.8		1.2	14.1
	Canada and US	cus	0.6	1.1	2.5	1.3	1.5	0.0	0.2	2.5
	Not Western hemisphere	xwh	7.3	11.4	14.2	3.3	7.7	5.8	6.3	3.9
Agriculture and food	Western hemisphere	whm	5.3	3.9	6.5	6.4	2.2	1.4	6.5	6.6
	Latin America and Carib.	lac	8.4	6.5	6.4	14.1	3.3	14.0	10.0	16.5
	Brazil	bra	2.2	1.3		13.0	18.6	15.9	10.8	12.1
	Chile	chl	6.9	6.9	7.0		7.0		7.0	6.7
	Colombia	col	9.7	6.6	14.8	17.1		16.4	13.6	13.9
	Mexico	mex	9.3	16.5	19.6	9.7	11.5		8.6	24.5
	Canada and US	cus	3.2	2.2	6.5	1.4	1.6	0.3	4.1	4.4
	Not Western hemisphere	xwh	27.3	24.9	27.6	10.8	17.4	23.0	29.2	10.2
Agriculture	Western hemisphere	whm	4.4	3.2	7.7	5.5	1.7	0.5	5.6	4.3
	Latin America and Carib.	lac	8.3	5.0	7.7	14.4	2.3	10.0	10.3	9.8
	Brazil	bra	0.8	0.5		10.7	10.5	10.4	6.2	9.5
	Chile	chl	7.0	6.9	7.0		7.0		7.0	6.7
	Colombia	col	10.5	5.9	8.9	14.7		10.8	12.7	10.0
	Mexico	mex	10.7	12.7	17.9	16.8	3.2		10.5	11.9
	Canada and US	cus	1.7	2.4	7.7	1.0	1.5	0.2	0.8	2.9
	Not Western hemisphere	xwh	32.4	31.6	29.4	11.1	20.6	13.0	33.0	12.5
Processed foods	Western hemisphere	whm	6.1	4.7	5.5	7.2	3.4	2.4	7.2	7.4
	Latin America and Carib.	lac	8.6	7.6	5.9	13.9	3.7	15.2	9.6	19.3
	Brazil	bra	5.2	3.4		15.3	20.5	17.1	14.4	13.8
	Chile	chl	6.8	6.8	7.0		7.0		7.0	6.7
	Colombia	col	8.8	6.9	17.4	19.3		18.7	16.9	17.9
	Mexico	mex	7.7	19.4	25.5	2.9	13.0		6.3	29.4
	Canada and US	cus	4.5	1.9	4.9	1.8	2.4	0.4	5.9	4.9
	Not Western hemisphere	xwh	21.5	17.8	25.4	10.6	3.4	31.4	24.6	9.0
Mining and natural resources	Western hemisphere	whm	0.9	1.2	2.0	2.6	0.4	0.1	0.4	0.5
	Latin America and Carib.	lac	3.3	3.7	3.0	4.7	2.3	1.9	2.4	2.1
	Brazil	bra	0.7	0.7		3.4	0.4	2.4	0.7	0.3
	Chile	chl	7.0	7.0	7.0		6.7	0.0	6.7	6.7
	Colombia	col	4.7	3.6	5.2	5.0		4.0	6.8	7.2
	Mexico	mex	1.1	5.4	12.2		1.1		0.6	9.4
	Canada and US	cus	0.1	0.2	1.5	0.5	0.2	0.0	0.0	0.2
	Not Western hemisphere	xwh	3.7	4.9	1.5	0.6	0.1	8.0	1.8	1.6
Manufacturing	Western hemisphere	whm	1.9	2.6	5.1	5.8	3.2	0.7	1.5	4.1
	Latin America and Carib.	lac	5.1	7.5	7.9	9.3	2.9	11.7	4.3	12.2
	Brazil	bra	9.9	9.2		9.4	14.5	16.6	10.1	12.3
	Chile	chl	6.3	5.9	7.0		7.0		6.7	6.5
	Colombia	col	8.3	7.6	13.7	14.3		11.6	8.9	12.2
	Mexico	mex	1.4	11.7	16.5	0.5	3.0		0.7	14.2
	Canada and US	cus	0.6	1.1	2.3	1.5	4.0	0.0	0.2	2.7
	Not Western hemisphere	xwh	4.9	7.1	11.1	3.3	2.0	4.7	4.6	3.8

Table 16: Economic structure for Brazil, Chile, Colombia, and Mexico (% rates)

	Brazil						Chile						Colombia						Mexico					
	GDP	M/ GDP	X/ GDP	Un-skill	Skill	K+ L	GDP	M/ GDP	X/ GDP	Un-skill	Skill	K+ L	GDP	M/ GDP	X/ GDP	Un-skill	Skill	K+ L	GDP	M/ GDP	X/ GDP	Un-skill	Skill	K+ L
Cereals	1	53	30	24	1	74	1	26	15	46	1	53	1	53	0	50	2	48	1	48	3	46	1	53
Vegetables and fruits	0	38	42	23	1	76	5	1	55	46	1	53	3	6	22	46	1	53	1	8	37	46	1	53
Oil seeds	1	5	92	23	1	76	0	308	68	47	0	53	0	40	1	46	1	53	0	438	11	46	1	53
Sugar	1	1	63	35	4	61	0	14	0	43	2	56	1	4	33	33	4	63	1	2	4	27	2	71
Other crops	1	7	52	23	1	76	0	51	101	46	1	53	2	8	77	46	1	53	1	14	8	46	1	53
Livestock	2	1	3	23	1	76	2	2	3	46	1	53	4	1	2	46	1	53	1	13	9	46	1	53
Other natural resources	1	21	152	43	5	52	5	2	91	24	4	73	1	7	2	74	6	20	2	7	5	21	2	76
Fossil fuels	1	142	42	27	5	68	0	1427	141	13	3	84	4	2	134	18	3	79	2	26	86	8	2	90
Cattle meat	0	5	72	37	6	56	0	98	14	45	8	47	1	5	3	74	12	14	1	24	1	16	3	81
Dairy products	0	10	2	28	5	68	0	15	23	29	4	67	1	15	11	32	5	63	0	50	4	14	2	83
Other food	2	12	63	38	6	55	6	16	91	32	6	62	4	23	21	45	7	47	6	11	11	14	3	83
Textiles	1	41	36	34	5	61	1	82	18	39	6	55	1	126	75	56	8	36	2	58	51	26	4	70
Wearing apparel	1	9	11	79	13	8	1	133	15	43	7	50	1	12	85	61	9	30	1	32	101	23	4	73
Leather products	0	20	165	53	9	39	0	251	43	45	7	48	0	53	88	72	11	17	1	26	18	29	5	66
Basic manufactures	4	20	42	58	10	32	6	43	87	31	5	64	3	47	53	49	8	43	6	42	33	19	4	77
Other manufacturing	4	72	29	38	6	56	3	148	74	36	9	55	3	124	67	38	8	54	5	82	36	19	5	77
Metals	1	64	179	27	4	68	4	22	227	27	5	68	1	111	80	56	9	35	2	53	30	22	4	74
Motor vehicles and parts	1	119	145	28	5	67	0	455	51	32	7	60	0	472	190	65	13	22	2	129	197	24	6	70
Other equipment	4	131	62	40	7	53	1	980	88	44	12	44	1	636	100	62	15	23	7	149	201	25	7	68
Electric and gas utilities	3	16	0	42	13	45	4	1	0	19	9	73	2	0	1	18	8	73	0	3	1	17	8	75
Construction	9	0	0	19	4	76	6	0	0	44	8	48	5	0	0	41	7	52	4	0	2	54	10	35
Services	63	5	3	38	30	33	52	11	9	24	19	57	61	6	4	44	27	30	54	5	4	20	14	66
Total	100	17	16	36	21	43	100	34	37	29	12	59	100	19	18	43	18	38	100	28	31	23	10	68
Agri / Rural Act	5	11	39	25	1	74	9	8	37	46	1	53	12	10	24	46	1	53	5	20	15	44	1	55
Mining	2	97	83	33	5	62	6	71	94	23	4	73	4	2	110	28	4	69	4	19	55	13	2	85
Light Manuf	5	15	56	42	7	51	9	42	67	34	6	60	7	29	35	51	8	42	11	23	26	18	3	79
Other Manuf	14	78	58	43	7	50	15	134	123	32	7	61	8	158	70	47	9	44	21	96	105	22	5	73
Services	75	5	3	36	26	38	62	10	8	26	17	58	69	5	4	43	25	33	59	5	4	22	14	64

Table 17: Sectoral adjustments (% changes with respect to initial levels)

	Exports Vol.				Imports Vol.				Production Vol.			
Brazil	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS
Total	12.4	21.5	1.1	15.2	11.6	25.5	2.9	14.5	0.1	-0.2	0.0	0.1
Agri / Rural Act	2.1	17.8	0.3	3.4	2.7	46.2	7.6	4.8	0.2	3.1	1.2	0.3
Mining	2.9	6.0	-1.4	-0.5	2.0	7.8	1.6	-6.3	0.1	-1.1	-0.8	1.2
Light Manuf	9.3	40.9	16.1	13.1	18.9	69.2	5.3	37.4	0.5	1.0	1.2	0.3
Other Manuf	21.6	26.0	-1.4	25.5	16.0	30.4	2.5	20.7	0.3	-2.1	-0.9	-0.1
Services	-1.6	-5.4	-5.2	1.2	0.8	4.0	3.1	-0.6	-0.1	0.2	0.0	0.0
Chile	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS
Total	5.9	7.2	-0.2	5.7	7.9	10.1	0.1	7.3	0.1	0.0	0.0	0.1
Agri / Rural Act	3.5	3.4	-0.8	3.8	17.8	6.7	-3.6	17.5	0.1	0.8	0.3	0.1
Mining	4.1	5.3	0.0	4.3	7.3	9.2	0.1	6.9	0.3	0.3	-0.1	0.5
Light Manuf	13.6	17.1	1.5	11.7	16.4	19.6	-1.8	15.3	0.7	0.5	0.3	0.5
Other Manuf	8.0	7.4	-0.5	7.4	7.8	10.6	0.3	7.3	0.3	-1.0	-0.3	0.2
Services	-1.9	2.2	-0.4	-0.7	1.7	2.9	1.2	0.8	-0.1	0.2	0.0	-0.1
Colombia	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS
Total	8.5	10.7	-1.7	9.5	7.0	11.6	-0.9	8.5	-0.1	-0.4	-0.1	-0.1
Agri / Rural Act	9.5	39.6	12.9	10.5	19.3	36.7	4.7	19.6	0.1	0.6	0.4	0.1
Mining	1.8	1.1	-0.2	2.4	13.3	24.9	-0.9	14.7	0.5	0.1	-0.1	0.8
Light Manuf	25.5	12.2	-7.2	27.0	25.2	35.0	-2.3	32.5	0.7	-1.9	-0.8	0.4
Other Manuf	7.8	5.6	-8.5	8.1	5.4	8.9	-1.5	6.6	-1.3	-3.8	-1.5	-2.2
Services	6.2	8.4	0.0	8.7	-3.4	-3.3	0.4	-4.6	0.0	0.4	0.2	0.0
Mexico	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS	FTAA	FULLIB	DOHA	FTCS
Total	3.3	11.8	0.1	6.5	3.8	14.8	-0.1	8.2	0.0	0.0	0.0	0.0
Agri / Rural Act	17.0	32.9	5.4	19.5	18.9	37.1	3.1	19.7	-0.2	0.2	0.1	-0.2
Mining	0.8	1.7	0.0	1.8	3.1	9.0	-0.6	4.8	-0.1	-0.9	0.0	0.0
Light Manuf	6.2	69.8	-0.8	14.9	10.3	52.0	0.8	28.5	0.0	1.6	-0.2	-0.3
Other Manuf	3.0	6.6	-0.1	5.9	2.8	10.8	-0.3	6.4	0.3	-0.7	0.0	0.3
Services	0.2	-3.0	1.4	1.8	-0.1	2.5	-0.6	-1.0	-0.1	0.0	0.0	0.0

Table 18: Nominal price changes for factors and consumption aggregates—low mobility, percent

	Brazil				Chile				Colombia				Mexico			
	FTAA	FULLIB	Doha	WHCU	FTAA	FULLIB	Doha	WHCU	FTAA	FULLIB	Doha	WHCU	FTAA	FULLIB	Doha	WHCU
Non-farm skilled real wage	0.30	0.52	1.13	-0.40	1.32	1.47	0.61	0.78	-1.53	-2.11	-0.01	-2.10	0.04	0.64	-0.46	-0.15
Non-farm unskilled real wage	0.45	-0.30	0.87	-0.33	1.82	1.29	0.61	1.11	-1.41	-2.97	-0.46	-2.12	0.20	0.72	-0.53	-0.04
Non-farm capital real rent	1.57	4.42	2.16	0.65	1.98	2.02	0.40	1.43	-0.46	-0.96	-0.12	-0.86	0.32	1.84	-0.30	-0.19
Farm skilled real wage	0.30	0.52	1.13	-0.40	1.32	1.47	0.61	0.78	-1.53	-2.11	-0.01	-2.10	0.04	0.64	-0.46	-0.15
Farm unskilled real wage	3.13	51.44	17.45	3.74	3.34	20.21	4.82	2.99	-2.34	19.76	9.11	-2.63	-6.40	-3.26	1.26	-6.70
Farm capital & land real rent	1.70	21.52	7.79	1.31	1.62	5.87	1.67	1.16	-0.61	5.63	2.94	-1.13	-1.16	1.27	0.31	-1.79
Non-farm skill/unskill wage gap	-0.15	0.82	0.25	-0.07	-0.49	0.18	0.01	-0.33	-0.12	0.88	0.45	0.02	-0.15	-0.08	0.08	-0.11
Farm skill/unskill wage gap	-2.75	-33.63	-13.90	-4.00	-1.95	-15.59	-4.02	-2.15	0.83	-18.26	-8.36	0.54	6.88	4.03	-1.70	7.02
Food prices	0.55	10.97	5.08	-0.19	1.06	4.84	1.74	0.45	-2.75	2.10	2.58	-3.58	-1.54	6.51	0.16	-2.58
Non-food prices	0.09	-0.33	1.04	-0.88	0.23	-0.64	0.43	-0.25	-1.70	-2.91	-0.10	-2.44	-0.08	-0.76	-0.43	-0.92
CPI	0.16	1.28	1.68	-0.78	0.44	0.71	0.78	-0.07	-1.99	-1.76	0.58	-2.76	-0.42	0.76	-0.29	-1.32
Real Income	0.05	0.24	0.04	0.19	0.11	0.18	-0.01	0.07	0.01	0.26	0.01	0.16	0.07	0.45	0.02	0.41

Table 19: Poverty simulation results--low mobility

		Brazil			Chile			Colombia			Mexico		
		H	**PG**	**P2**	**H**	**PG**	**P2**	**H**	**PG**	**P3**	**H**	**PG**	**P3**
		Absolute levels											
Initial level	**All**	23.5%	9.6%	5.3%	21.0%	7.3%	3.8%	60.7%	32.6%	21.8%	50.2%	20.7%	11.2%
	Non-farm	22.0%	8.8%	4.8%	20.9%	7.3%	3.8%	59.2%	31.5%	21.0%	48.4%	19.5%	10.4%
	Farm	38.7%	17.1%	9.8%	23.2%	7.4%	3.6%	78.2%	45.4%	31.6%	72.4%	35.5%	21.3%
		Percent changes from initial levels											
FTAA	**All**	-0.64%	-1.32%	-1.70%	-1.82%	-2.04%	-1.85%	-0.24%	-0.49%	-0.50%	-0.32%	0.47%	1.04%
	Non-farm	-0.46%	-1.04%	-1.34%	-1.71%	-1.93%	-1.75%	-0.24%	-0.52%	-0.54%	-0.47%	0.12%	0.59%
	Farm	-1.67%	-2.78%	-3.40%	-3.66%	-4.03%	-3.76%	-0.21%	-0.23%	-0.23%	1.00%	2.85%	3.78%
Full Lib	**All**	-5.97%	-10.77%	-13.77%	-4.42%	-4.53%	-4.01%	-0.16%	-1.16%	-1.74%	1.17%	2.05%	2.72%
	Non-farm	-2.63%	-6.22%	-8.62%	-3.43%	-3.59%	-3.20%	0.27%	-0.49%	-0.94%	1.14%	1.91%	2.53%
	Farm	-24.51%	-33.80%	-38.47%	-20.60%	-21.34%	-19.45%	-4.01%	-6.58%	-7.95%	1.39%	3.02%	3.93%
Doha	**All**	-1.07%	-3.84%	-5.21%	-0.63%	-0.78%	-0.71%	0.29%	-0.07%	-0.27%	0.18%	-0.03%	-0.15%
	Non-farm	0.23%	-2.09%	-3.14%	-0.41%	-0.54%	-0.50%	0.53%	0.23%	0.09%	0.22%	0.07%	-0.03%
	Farm	-8.31%	-12.68%	-15.13%	-4.27%	-5.11%	-4.78%	-1.80%	-2.48%	-3.07%	-0.20%	-0.70%	-0.90%
WHCU	**All**	-1.00%	-1.96%	-2.51%	-1.79%	-1.93%	-1.75%	-0.38%	-0.62%	-0.66%	-0.82%	-0.18%	0.29%
	Non-farm	-0.73%	-1.52%	-1.96%	-1.66%	-1.80%	-1.64%	-0.35%	-0.64%	-0.68%	-1.03%	-0.56%	-0.20%
	Farm	-2.47%	-4.20%	-5.11%	-3.84%	-4.25%	-3.97%	-0.69%	-0.45%	-0.48%	0.97%	2.47%	3.28%

Table 20: Nominal price changes for factors and consumption aggregates—high mobility, percent

	Brazil				Chile				Colombia				Mexico			
	FTAA	FULLIB	Doha	WHCU	FTAA	FULLIB	Doha	WHCU	FTAA	FULLIB	Doha	WHCU	FTAA	FULLIB	Doha	WHCU
Non-farm skilled real wage	0.34	1.20	1.40	-0.33	1.36	1.88	0.71	0.83	-1.54	-1.70	0.17	-2.11	-0.27	0.44	-0.38	-0.47
Non-farm unskilled real wage	0.63	2.44	1.91	-0.06	1.90	2.13	0.81	1.21	-1.47	-1.55	0.19	-2.15	-0.39	0.36	-0.38	-0.64
Non-farm capital real rent	1.44	2.66	1.44	0.45	1.95	1.81	0.35	1.40	-0.43	-1.56	-0.41	-0.84	0.47	1.94	-0.34	-0.03
Farm skilled real wage	0.34	1.20	1.40	-0.33	1.36	1.88	0.71	0.83	-1.54	-1.70	0.17	-2.11	-0.27	0.44	-0.38	-0.47
Farm unskilled real wage	2.02	28.95	10.37	2.05	3.10	16.77	4.00	2.69	-2.05	13.06	6.24	-2.47	-4.79	-2.38	0.79	-5.09
Farm capital & land real rent	1.91	25.45	8.94	1.63	1.76	7.28	1.97	1.32	-0.72	8.64	4.14	-1.19	-1.87	0.79	0.48	-2.51
Non-farm skill/unskill wage gap	-0.29	-1.21	-0.51	-0.27	-0.52	-0.24	-0.10	-0.38	-0.07	-0.16	-0.02	0.05	0.12	0.08	0.01	0.17
Farm skill/unskill wage gap	-1.64	-21.52	-8.13	-2.33	-1.69	-12.75	-3.16	-1.81	0.52	-13.06	-5.72	0.37	4.74	2.89	-1.16	4.86
Food prices	0.53	10.66	4.97	-0.22	1.06	4.73	1.71	0.44	-2.73	1.76	2.40	-3.57	-1.52	6.50	0.15	-2.56
Non-food prices	0.11	0.04	1.18	-0.85	0.24	-0.55	0.45	-0.24	-1.71	-2.57	0.05	-2.45	-0.11	-0.78	-0.42	-0.95
CPI	0.18	1.55	1.77	-0.76	0.44	0.74	0.78	-0.07	-1.99	-1.59	0.64	-2.77	-0.45	0.74	-0.29	-1.34
Real Income	0.03	-0.03	-0.06	0.16	0.11	0.19	-0.01	0.07	0.02	0.22	-0.01	0.17	0.09	0.46	0.02	0.42

Table 21: Poverty simulation results--high mobility

		Brazil			Chile			Colombia			Mexico		
		H	PG	P2	H	PG	P2	H	PG	P3	H	PG	P3
		Absolute levels											
Initial level	**All**	23.5%	9.6%	5.3%	21.0%	7.3%	3.8%	60.7%	32.6%	21.8%	50.2%	20.7%	11.2%
	Non-farm	22.0%	8.8%	4.8%	20.9%	7.3%	3.8%	59.2%	31.5%	21.0%	48.4%	19.5%	10.4%
	Farm	38.7%	17.1%	9.8%	23.2%	7.4%	3.6%	78.2%	45.4%	31.6%	72.4%	35.5%	21.3%
		Percent changes from initial levels											
FTAA	**All**	-3.78%	-5.22%	-5.99%	-2.39%	-2.60%	-2.35%	-1.65%	-2.68%	-3.20%	-1.53%	-2.74%	-3.47%
	Non-farm	-2.58%	-3.76%	-4.44%	-2.16%	-2.39%	-2.16%	-1.24%	-2.25%	-2.72%	-1.09%	-2.18%	-2.84%
	Farm	-10.44%	-12.63%	-13.44%	-6.15%	-6.38%	-6.06%	-5.29%	-6.19%	-6.92%	-5.22%	-6.56%	-7.35%
Full Lib	**All**	-5.23%	-9.77%	-12.08%	-4.48%	-4.85%	-4.31%	-1.54%	-2.83%	-3.67%	-0.24%	-1.08%	-1.64%
	Non-farm	-2.64%	-6.43%	-8.28%	-3.63%	-4.03%	-3.61%	-0.94%	-2.03%	-2.74%	0.28%	-0.40%	-0.85%
	Farm	-19.68%	-26.72%	-30.29%	-18.25%	-19.50%	-17.89%	-6.85%	-9.38%	-10.89%	-4.69%	-5.79%	-6.48%
Doha	**All**	-3.05%	-5.95%	-7.15%	-1.21%	-1.27%	-1.14%	-1.21%	-2.00%	-2.60%	-1.35%	-3.01%	-4.14%
	Non-farm	-1.34%	-3.90%	-4.87%	-0.90%	-0.97%	-0.88%	-0.71%	-1.40%	-1.91%	-0.84%	-2.29%	-3.29%
	Farm	-12.58%	-16.32%	-18.06%	-6.28%	-6.58%	-6.24%	-5.62%	-6.91%	-7.96%	-5.67%	-7.95%	-9.39%
WHCU	**All**	-4.03%	-5.66%	-6.52%	-2.39%	-2.48%	-2.24%	-1.70%	-2.79%	-3.32%	-2.35%	-3.39%	-4.22%
	Non-farm	-2.81%	-4.14%	-4.90%	-2.15%	-2.25%	-2.04%	-1.29%	-2.36%	-2.85%	-1.96%	-2.87%	-3.63%
	Farm	-10.80%	-13.35%	-14.32%	-6.34%	-6.49%	-6.16%	-5.35%	-6.31%	-7.05%	-5.56%	-6.95%	-7.83%