

TMD DISCUSSION PAPER NO. 90

**SCENARIOS FOR TRADE INTEGRATION IN THE
AMERICAS**

**Xinshen Diao
Eugenio Díaz-Bonilla
Sherman Robinson
International Food Policy Research Institute**

**Trade and Macroeconomics Division
International Food Policy Research Institute
2033 K Street, N.W.
Washington, D.C. 20006, U.S.A.**

February 2002

TMD Discussion Papers contain preliminary material and research results, and are circulated prior to a full peer review in order to stimulate discussion and critical comment. It is expected that most Discussion Papers will eventually be published in some other form, and that their content may also be revised. This paper is available at <http://www.cgiar.org/ifpri/divs/tmd/dp.htm>

Abstract

This paper analyzes two potential trade liberalization scenarios – a Free Trade Area of the Americas (FTAA) and possible links between MERCOSUR and the European Union (EU) – in a world computable general equilibrium (CGE) model. The model also incorporates some macro elements such as a cash-in-advance mechanism and rigidities in wages and exchange rates. The empirical results show that the two alternative regional integration scenarios are good for the participants while have little impact on the non-participants. Both scenarios are net trade creating, as trade creation greatly exceeds trade diversion, and the trade-diversion has relatively minor effects on the affected regions. The gains are larger for the Latin American participants than for their large potential partners – the U.S. and EU. These results are consistent with earlier studies of NAFTA, which also predicted small positive gains for the U.S. and large gains for Mexico. Many countries in Latin America are currently undergoing macroeconomic strains, and growth in the region has slowed. In this environment, external shocks and stabilization and structural adjustment programs are likely to lead to significant swings in trade balances and exchange rates. These issues will have to be considered in acknowledging that it is hard to reap the long-term benefits of trade liberalization in an environment of macroeconomic instability.

Table of Contents

I. INTRODUCTION	1
II. MODEL AND DATA	2
III. SIMULATIONS.....	5
(a) Scenarios.....	5
(b) Closure.....	7
(c) Results	8
IV. CONCLUSIONS	9
References	12
Chart 1	14
Chart 2.....	15
Table 1 Countries and Regions	17
Table 2 Products.....	18
Table 3. Change in real GDP and consumer price index (% change from the base)	19
Table 4. Decomposition of FTAA effect on real GDP in America (% change from the base)	20
Table 5. Change in real wages or employment (% change from the base).....	21
Table 6. Change in total imports and exports (% change from the base)	22
Table 7. Change in total trade by region.....	23
List of Discussion Papers	24

I. INTRODUCTION

Trade liberalization and economic integration in the Americas has been progressing at a steady pace since the mid-1980s. There are several reasons for these developments. On the political side, the spread of democracy in the Continent opened new opportunities for dialogue and collaboration across countries, including, but going beyond, trade to include non-economic aspects. Democratic interaction replaced the segmentation and distrust that characterized much of the inter-country relationships under previous military regimes.

On the economic side, there were important changes in trade, macroeconomic, public sector, and regulatory policies. Reduction of trade barriers occurred multilaterally, as a result of GATT/WTO negotiations; regionally, as a consequence of different trade agreements in the American continent; and unilaterally, depending on specific liberalization programs in different countries. Other economic changes, including liberalization of the current and capital accounts of the balance of payments, national treatment of foreign investments, markets deregulation, and privatization of public enterprises, led to larger capital flows and foreign direct investment in the Americas. Chart 1 presents an index of policy changes for Latin America showing the clear acceleration of policy reforms in the 1990s (Morley, Machado, and Pettinato, 1999 extending work by Eduardo Lora at the IADB). All those transformations opened opportunities for the civil society in the Americas to increase the economic, political, social, and cultural exchanges in the Continent. They also increased the integration with the world economy of LAC countries (see Charts 2 and 3, for trade and financial flows).

Although the ratio of capital flows to GDP appear to be decreasing lately (and never got back to the levels of the 1970s that ended in the debt crises of the 1980s) the process of trade expansion continues, both because of additional policy changes related mainly to the multiple levels of different trade negotiations currently taking place, and due to greater familiarity in the private sector with international trade opportunities created by previous policy changes. The latter implies that even in the absence of new trade liberalization initiatives, a greater densification of the trade flows within the region should be expected—a product of the learning process in the private sector. But, as

indicated, there are different new policy negotiations and initiatives in process that would eventually facilitate further trade expansion, in the region.

There are ongoing discussions of expanding NAFTA to include a Free Trade Area of the Americas (FTAA), of the impact of MERCOSUR, of possible links between MERCOSUR and the European Union (EU), and of further global trade liberalization under the next round of WTO talks scheduled to start in November 2001. While there is a growing literature analyzing various integration and trade liberalization scenarios in Latin America using multi-country world models,¹ this paper concentrates on only two potential future trade scenarios for those negotiations: a possible FTAA and a potential agreement between MERCOSUR and the European Union. Because of the complexity of the scenarios considered, the framework of analysis is a world computable general equilibrium (CGE) model.² The rest of the paper is organized as follows. The next section reviews the main characteristics of the model and the data utilized. The following section discusses the nature of the policy experiments, and analyzes the main results. Finally some policy conclusions and issues for further analysis are presented.

II. MODEL AND DATA

The framework of analysis is a general equilibrium model with a multi-region and multi-sector specification. The base year is 1998 and most of the data come from the database of the Global Trade Analysis Project (GTAP), version 5 (McDougall et al., 1998).

The structure of this class of static world CGE is described in greater detail elsewhere (see for instance Noland et al, 1999). It can also be run in a dynamic specification (see Diao and Somwaru, 2000), but then the level of disaggregation of products and countries/regions must be reduced compared to what is being presented here. There are 38 products and 29 countries and regions (see Tables 1 and 2). The disaggregation for the agricultural and agroindustrial goods and for the American

¹ See, for example, the survey in Robinson and Thierfelder (1999); Robinson, Burfisher, and Thierfelder (1998); Diao and Somwaru, 2000 and 2001; Hinojosa-Ojeda et al., 1995 and 1997; Burfisher and Jones, eds., 1998; Roland-Holst and van der Mensbrugghe, 2001.

² There is a active literature analyzing various integration and trade liberalization scenarios in Latin America using multi-country world CGE models. See, for example, the survey in Robinson and Thierfelder (1999). Recent examples include: Diao and Somwaru, 2000 and 2001; Hinojosal-Ojeda et al., 1995 and 1997; and Burfisher and Jones, eds., 1998.

Continent is the maximum possible included in the GTAP v5 database.³ For the aggregation of other developing regions a cluster analysis of food security situations (Diaz-Bonilla et al, 2000) was utilized. There are 5 factors of production: skilled labor, unskilled labor, capital, land, and natural resources.

The main institutions of the model are as follows. First, there is a single private household in each country that saves a constant proportion of disposable income and buys consumption goods. The household in each country owns the firms but also works there, receiving wages, distributed profits, and lump-sum transfers (which may be negative) from the government. The government spends all its tax revenues on consumption or lump-sum transfers to households. A capital account collects savings and buys investment goods. Producers within a country/region are aggregated into one representative firm for each sector, which produces the respective good or service, buying intermediate goods and hiring factors of productions. In making production decisions, the firms choose the levels of labor and intermediate inputs to produce a single sectoral output, taking into account the price of sectoral outputs, the wage rate, the prices of intermediate inputs, and the existent stock of capital. Sectoral outputs are either sold in the domestic market or exported to foreign markets.

In a multi-region and multi-sector global model, with an Armington (1969) specification, the domestically produced and consumed good from each sector is different both from the export good generated in that same sector (with that differentiation captured through a CET function), and from the imported good corresponding to that sector (utilizing a CES function). The composite export and import goods from each sector are differentiated by country of origin/destination based on constant elasticity functions acting as an aggregator. Commodity trade flows are differentiated by their geographical and sectoral origin and destination.

Domestic and world markets for goods and services equilibrate through changes in endogenously determined prices. Domestic production and consumption prices interact with world prices, the real exchange rate per country, different levels of border protection, and, if applicable, consumption, production, and export subsidies.

³ The model includes 13 Latin American country/regions; 8 are countries and 3 are regional aggregations.

Factor markets also equilibrate through the interaction of demand, supply and prices. In the simulations the supply of all factors of production other than labor are kept at the base levels, and there are no changes in inter-country savings and investments flows. The labor markets can be run with full employment (with wages as the equilibrating variable) or two alternative specifications with endogenous unemployment: one with nominal wages fixed and one with real wages fixed.⁴ Wages (and returns to other factors of production) may vary due to other imperfections in markets that are assumed not to change for the policy experiments presented here.

The model has two other specification changes from the standard world CGE framework. First, it includes a cash-in-advance technology (Clower, 1967) that can be utilized to anchor the nominal variables (see Walsh 1998, among others, for a general discussion of cash-in-advance models; Díaz-Bonilla and Piñeiro, 1999, and Díaz-Bonilla, Reca, and Piñeiro, 2000, for the inclusion of a cash-in-advance technology in a CGE model). If all nominal variables are free to move, money is a “veil” and the model behaves as in the classical dichotomy in Walrasian models between the determination of relative prices and the determination of absolute levels (Patinkin, 1965). If there is any rigidity in a monetary variable, then changes in money supply or demand will have real effects. The importance of those effects will depend on the number of variables affected by nominal resistance and the degree of such resistance. A cash-in-advance specification can be derived by assuming money in the utility function (Feenstra, 1986), linking the monetary technology to the value of consumption goods. Conceivably, money can also appear as an argument in the production function (Fisher, 1974), which would link the monetary constraint to the value of production.⁵ Here the cash-in-advance technology combines constraints for both consumption sales and a production, equally weighted.

Second, it is assumed that trade liberalization affects country productivity through different channels: the learning-by-doing, access to new knowledge, and scale effects of increased exports; the technological spillovers due to greater availability of better capital and intermediate goods for production; and the increase in competition in previously

⁴ The model considers the real wage, i.e. the nominal wages divided by the consumer price index. Simulations can also be done with the real wage normalized by producer price index.

⁵ In principle, both specifications are compatible with how national accounts may be set up according to the System of National Accounts 1993 (CEU, IMF, OECD, UN, and World Bank, 1993), although the production approach is more commonly applied.

protected domestic markets (see the discussion of the links between trade, technology and productivity in Balassa, 1989; Grossman and Helpman, 1995; and Romer, 1994; for CGE applications with productivity linked to trade see, for instance, de Melo and Robinson, 1995; Lewis, Robinson, and Wang, 1995; and Diao and Somwaru, 2001). The model includes an endogenously determined TFP variable for each sector's value-added function. Within each country, the sectoral TFP is augmented with the increase in the volume of total trade normalized by country's total labor supply. By assuming a labor-augmenting technological change, the elasticity in the sectoral TFP function is calibrated from the factor intensity at sector's level for each country.

The US nominal exchange rate is fixed at 1, i.e., the US dollar is chosen as the world numeraire, and world prices are expressed in US dollars. Every country has its own nominal exchange rate, which may be fixed or allowed to float depending on the choice of the closure (see below), and also a country-specific numeraire price index (a price index of domestic goods). Changes in the nominal exchange rate in a region correspond to a change in the real exchange rate, defined as the ratio of the prices of traded goods to non-traded goods in each country/region. In this class of country models, there is a functional relationship between the real exchange rate and the trade balance in each region (Devarajan, Lewis, and Robinson, 1993).

III. SIMULATIONS

(a) Scenarios

The world CGE is utilized to simulate two scenarios: a Free Trade Area of the Americas (FTAA), and a free trade agreement between MERCOSUR (including Chile and Bolivia) and the European Union (FTMEU). Trade restrictions are measured as *ad valorem* tariff equivalents. The main source of the initial levels of tariff rates for the countries and regions in the model is the same database GTAP v5. The tariff rates are weighted applied rates for each individual country and region in the database, and the weights are sectoral import shares for countries/regions in the model.

In both simulations it is assumed that full market access is allowed for all sectors across the participating countries or regions (i.e. all tariff barriers are eliminated). Obviously, the model can also be run with sectors exempted in different degrees from full

market access (say sugar or automobiles), including the permanence of some tariff rate quotas. The European Union has been negotiating numerous free trade agreements with important exclusions in agriculture (see the European Commission, 2001). The simulations reported here assume no exclusions from free market access. However, regarding agriculture, it is also assumed that neither the US and Canada (within the FTAA), nor the EU (within the FTMEU), will eliminate support to their producers in the regional trade agreements considered here. Those countries have already indicated that they are prepared to negotiate domestic support only within multilateral negotiations in the WTO. Therefore, the distorting effects of producer subsidies remain. Moreover, agricultural trade, such as trade in vegetable and fruit, is also blocked by phytosanitary barriers, quotas, and voluntary export restraint agreement. Such barriers do not show up on the tariff equivalent data included in the GTAP v5. For this reason, the potential impact of the full market accession may be underestimated in the model.

As mentioned, the European Union is negotiating numerous trade agreements, and, more importantly, it is embarked in the process of enlargement of the Union. There are 13 countries considered as potential candidates for inclusion in the EU: Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, the Slovak Republic, Slovenia and Turkey. Accession negotiations have started with all of them except Turkey.

In addition, the EU has negotiated a FTA with South Africa in October 1999; signed the Cotonou Agreement (successor to previous Lomé Conventions) with 77 African, Caribbean and Pacific (ACP) countries on June, 2000, which (among other things) establishes that Regional Economic Partnership Agreements (REPA) on trade will be negotiated and prepared between 2002-2008; and the EU approved the so-called 'Everything But Arms' (EBA) Initiative on February 26, 2001, which removes all tariffs and quotas on all EU imports except arms (but also establishes special regimes for sugar, rice, and bananas) from the 49 Least Developed Countries (which include 40 Least Developed ACP countries) (see the discussion in Bjørnskov and Krivonos, 2001). There are also bilateral agreements with a number of countries, including some in the Americas, like Mexico. A full evaluation of a MERCOSUR-EU free trade agreement should include the different trade agreements that temporally and politically will most likely take

precedence over MERCOSUR in the EU negotiating process. Here, however, we concentrate on a “pure” FTMEU, and the results should be considered an upper bound for possible impacts on MERCOSUR countries.

Similarly, the FTAA and the FTMEU can be run with or without other important trade events, such as the entry of China in the WTO, and further WTO negotiations for agriculture and other sectors. Those events are not factored in the simulations presented here.

(b) Closure

The simulations are based on a mix of regimes for labor markets. For all the countries in Latin America unemployment is allowed and the simulations are run with real wages fixed⁶, while the United States and Canada are run on the assumption of a full employment regime (with flexible wages playing the equilibrating role). The rest of the countries and regions are also run with fixed labor supplies, and wages equilibrate their labor markets.

Countries with hard pegs such as Argentina’s Currency Board, and those that adopted a dollarization regime, are run with fixed nominal exchange rates. All the rest of the countries float against the dollar, which is the world numeraire. The real exchange rate is determined endogenously in all countries, and country trade balances (and hence capital inflows) are assumed fixed exogenously (Devarajan, Lewis, and Robinson, 1993; Robinson, 1991).

Although the cash-in-advance constraint allows the determination of nominal variables by fixing the money supply, the simulations presented here follow the more traditional approach of defining a price index as the domestic numeraire to facilitate comparison with other simulations. The index utilized corresponds to the prices of the domestic goods.

Overall foreign savings (trade balances), investment demand, and government consumption of goods and services are all kept constant at base levels.

⁶ The real wages are the nominal wages normalized by the consumer price index. Similarly, the producer price index can be used as a normalizer.

(c) Results

Tables 3 to 7 show different indicators of the simulated effects of the FTAA and FTMEU.

Changes in real GDP are positive for the countries participating in the FTAA and the FTMEU, while levels of the consumer prices decline slightly (Table 3). For the bigger countries (USA and Canada, in the FTAA, and the European Union, in the FTMEU), the increases in the GDP are below 1%. Mexico, which already has access to the US and Canadian markets, benefits slightly from the FTAA. Central America and Colombia appear to have larger increases in real GDP from the FTAA (6.3% and 5.5%, respectively). Chile and Uruguay, already global traders, have the smallest increase. For FTMEU, Argentina and the region of rest of South America gain the most in terms of real GDP, while Chile gains the least. Both the FTAA and the FTMEU appear to generate quite small effects on rest of the world in terms of change in GDP, and some countries, mostly in Asia, are slightly negatively affected.

Gains in American countries' GDP due to FTAA are further decomposed according to three different sources – efficiency in resource allocation, improvement in TFP, and increase in employment. Without taking into account TFP effects and possible job creation, gains from FTAA for American countries due to more efficient allocation of current endowments, i.e., current supply of labor, capital, and land, are modest. While job creation due to FTAA generates additional modest gains in GDP, the most important contribution to the rise in GDP is from the improvement in TFP, accounting as high as 85 – 90% of increased GDP in Canada and US, and more than 50% for the other 8 Latin American countries/regions (table 4).

The impacts of the simulations on wages or labor markets appear in Tables 5. For US and Canada in which wages are the equilibrating variables in labor markets, the simulations show small increases in real wages for both skilled and unskilled labor after FTAA. For the rest of world, both FTAA and FTMEU produce minor effects on the real wages. In the case of the LAC countries, whose labor markets are modeled in an unemployment mode with rigid real wages, the equilibrating variable is employment. Both the occupation of skilled and unskilled labor increases across Latin America under the FTAA, with the strongest percentage increases in Central America and Caribbean,

Argentina, and rest of South America for the unskilled labor, and Central America, Colombia, and rest of Andean Pact for the skilled labor. Changes in employment in Chile and Uruguay, although positive, tend to be smaller than for the other LAC countries. The percentage changes of the simulations suggest an overall increase of employment of about 5.1-5.6 million jobs in the participating LAC countries.

The FTMEU also creates strong employment effects in the MERCOSUR members, with the largest increases for Argentina, and the Rest of Mercosur, and the smallest for Chile. The increases in total employment amount to about 2.8-3.0 million jobs.

Tables 6 and 7 show changes in trade as a result of both agreements. In the FTAA, exports and imports increase significantly for most countries in the America, while trade rises modestly in US and Canada (which are big diversified exporters), Mexico (which already has access to the US market). The FTMEU show similar patterns, with the European Union showing small increases, and strong effects for the Latin countries, with Chile appearing at the lower end (Table 6).

The FTAA creates trade (exports plus imports) at the world level, for about 60 billion US dollars, or 0.7% of total world trade. There is a very small amount of trade decrease (trade diversion) in the countries not participating in the FTAA of about 1 billion US dollars (or 0.02% of the trade of the countries not participating). The effect of the FTMEU on world trade is about half that of the FTAA: it leads to an increase of world trade of about 30 billion US dollars, or about 0.35% of the world trade, also with a very small decrease of trade in the non-participating countries (Table 7). The result that the regional trade agreements are net trade creating is consistent with empirical studies of many such agreements (Robinson and Thierfelder, 1999).

IV. CONCLUSIONS

The empirical results lead to the conclusion that these alternative regional integration scenarios—an FTAA or a potential agreement between MERCOSUR and the European Union—are good for the participants and have little impact on the non-participants. Trade creation greatly exceeds trade diversion, so both these scenarios are net trade creating, and the trade-diversion has relatively minor effects on the affected

regions. For example, real wages of unskilled workers fall very slightly in Asia, but the effect on skilled wages is negligible.

In general, the gains are larger for the Latin American participants than for their large potential partners—the US and EU. These results are consistent with earlier studies of NAFTA, which also predicted small positive gains for the US and large gains for Mexico (Burfisher, Robinson, and Thierfelder, 2001).

Many countries in Latin America are currently undergoing macroeconomic strains, and growth in the region has slowed. In this environment, external shocks and stabilization and structural adjustment programs are likely to lead to significant swings in trade balances and exchange rates. While short-term in nature, such swings cause far larger changes in the prices of tradable goods in these economies than would result from the sorts of trade liberalization and regional integration policies considered in this paper.⁷ The lesson is that it is hard to reap the long-term benefits of trade liberalization in an environment of macroeconomic instability.

Finally, a note on methodology. The model used in this paper is in the tradition of neoclassical multi-country computable general equilibrium models that, over the past fifteen years, have provided the core empirical framework for analyzing the impact of trade liberalization scenarios. It has long been recognized that this modeling framework must be extended to incorporate advances in both macro and micro elements if it is to provide an adequate framework for analyzing: (1) the impact of international and domestic policy liberalization on poverty and income distribution; and (2) the impact of structural adjustment and macro stabilization programs. Our model incorporates some macro elements such as a cash-in-advance mechanism and rigidities such as fixed wages and fixed exchange rates. While the literature on such extensions is growing, there is much to be done. We are still from providing an empirical or theoretical framework that adequately reconciles micro and macro theory.

On the distribution and poverty side, there is also much progress and much to be done. A few models have been developed of individual countries which incorporate both a CGE model and models of individual household behavior based on empirical work with

⁷ See, for example, Robinson, Burfisher, and Thierfelder (1998) who analyze the long-term impact on Argentina and Brazil of forming a customs union under Mercosur and compare the results with the impact of Brazilian devaluations.

household surveys. These “microsimulation models” hold great promise and work is underway at IFPRI using this framework in a number of Latin American countries.

References

- Burfisher, Mary and Elizabeth A. Jones, eds. (1998). *Regional Trade Agreements and U.S. Agriculture*. Agriculture Economic Report Number 771, Economic Research Service, U.S. Department of Agriculture.
- Burfisher, Mary, Sherman Robinson, and Karen Thierfelder (2001). "The Impact of NAFTA on the United States." *Journal of Economic Perspectives* 15(1): 125-44.
- Clower, Robert W. (1967). "A Reconsideration of the Microfoundations of Monetary Theory." *Western Economic Journal* 6(1, December): 1-9.
- Devarajan, Shantayanan, Jeffrey D. Lewis, and Sherman Robinson (1993). "External Shocks, Purchasing Power Parity, and the Equilibrium Real Exchange Rate." *World Bank Economic Review* 7(1): 45-63
- Diao, Xinshen, and Agapi Somwaru (2000). "An Inquiry on General Equilibrium Effects of MERCOSUR—An Intertemporal World Model." *Journal of Policy Modeling* 22(5): 557-88.
- Diao, Xinshen, and Agapi Somwaru (2001). "A Dynamic Evaluation of the Effects of A Free Trade Area of the Americas -- An Intertemporal, Global General Equilibrium Model." *Journal of Regional Integration* 16(1): 21-47.
- Díaz-Bonilla, Eugenio, Marcelle Thomas, Sherman Robinson and Andrea Cattaneo (2000). "Food Security and Trade Negotiations in the World Trade Organization: a Cluster Analysis of Country Groups" Trade and Macroeconomics Division, Working Paper Number 59. IFPRI. December.
- Díaz-Bonilla, Eugenio (1999). "Integration with divergent macroeconomic policies: The case of MERCOSUR." IFPRI/Fundacion Andina. Paper presented at the Inter-American Dialogue seminar on alternative responses to Brazil's financial crisis. February 12, Washington D.C.
- Díaz-Bonilla, Eugenio, Lucio Reza, and Valeria Piñeiro (1999). "Venezuela: Estrategias Agropecuarias Alternativas. Un Analisis Cuantitativo." Final Report, MAYC, IICA, IFPRI. Caracas and Washington, DC: October.
- Fischer, Stanley (1974). "Money in the Production Function." *Economic Inquiry* 12(4, November): 518-33.
- Hinojosa-Ojeda, Raúl A., Jeffrey D. Lewis, and Sherman Robinson (1997). *Convergence and Divergence between NAFTA, Chile, and MERCOSUR: Overcoming Dilemmas of North and South American Economic Integration*. Working Paper Series 219, Integration and Regional Programs Department, Inter-American Development Bank.
- Hinojosa-Ojeda, Raúl A., Jeffrey D. Lewis, and Sherman Robinson (1995). "Regional Integration Options for Central America and the Caribbean after NAFTA." *The North American Journal of Economics and Finance*, Vol. 6., no. 2, pp. 121-148.

- Lewis, Jeffrey D., Sherman Robinson, and Zhi Wang (1995). "Beyond the Uruguay Round: The Implications of an Asian Free Trade Area." *China Economic Review* 6(1): 35-90.
- de Melo, Jaime and Sherman Robinson (1992). "Productivity and Externalities: Models of Export-Led Growth." *Journal of Economic Trade and Economic Development* 1(1): 41-68.
- Morley, Samuel A., Roberto Machado, and Stefano Pettinato (1999). "Indexes of Structural Reform in Latin America." Serie Reformas Económicas 12, Economic Commission for Latin America and the Caribbean, United Nations, Santiago, Chile.
- Noland, Marcus, Li-Gang Liu, Sherman Robinson, and Zhi Wang (1998). *Global Economic Effects of the Asian Currency Devaluations*. Washington, DC: Institute for International Economics.
- Patinkin, Don (1965). *Money, Interest, and Prices*. 2nd edition. New York: Harper & Row.
- Robinson, Sherman (1991). "Macroeconomics, Financial Variables, and Computable General Equilibrium Models." *World Development* 19(11): 1509-25.
- Robinson, Sherman, and Karen Thierfelder (1999). "Trade Liberalization and Regional Integration: The Search for Large Numbers." TMD Discussion Paper No. 34, Trade and Macroeconomics Division, International Food Policy Research Institute (IFPRI).
- Robinson, Sherman, Mary Burfisher, and Karen Thierfelder (1998). "Agricultura, comercio y tasas de cambio en el Mercosur." In Lucio G. Reca and Ruben G. Echeverría, eds., *Agricultura, medio ambiente y pobreza rural en América Latina*. Washington, DC: Inter-American Development Bank.
- Roland-Holst, David and Dominique van der Mensbrugge (2001). "Regionalism versus Globalization in the Americas: Empirical Evidence on Opportunities and Challenges." Draft paper presented at the international symposium "Impacts of Trade Liberalization Agreements on Latin America and the Caribbean" sponsored by the Inter-American Development Bank, Washington, DC, November 5-6.
- Walsh, Carl E. (1998). *Monetary Theory and Policy*. Cambridge: MIT Press.

Chart 1

Index of Policy Reform in LAC

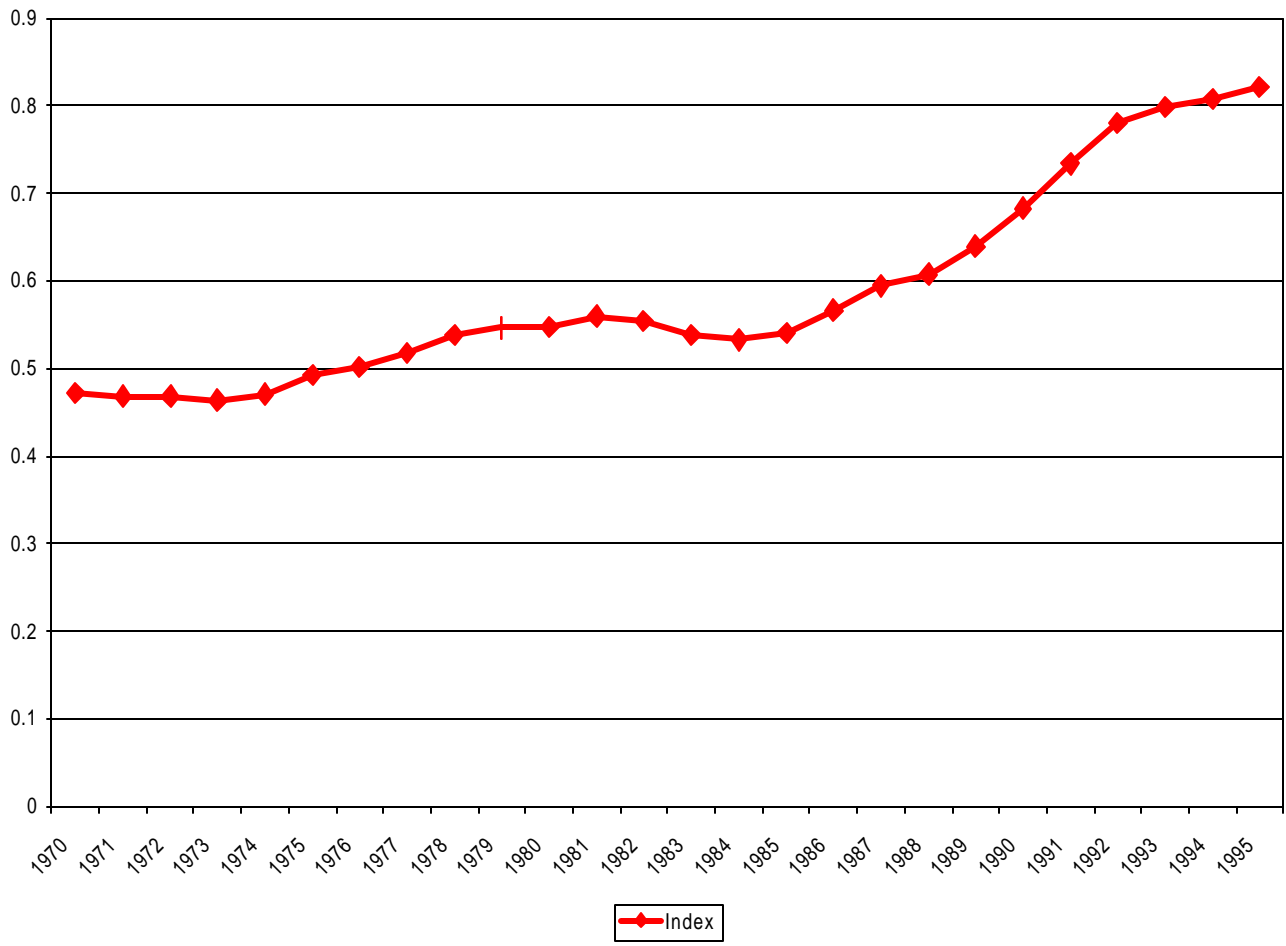


Chart 2

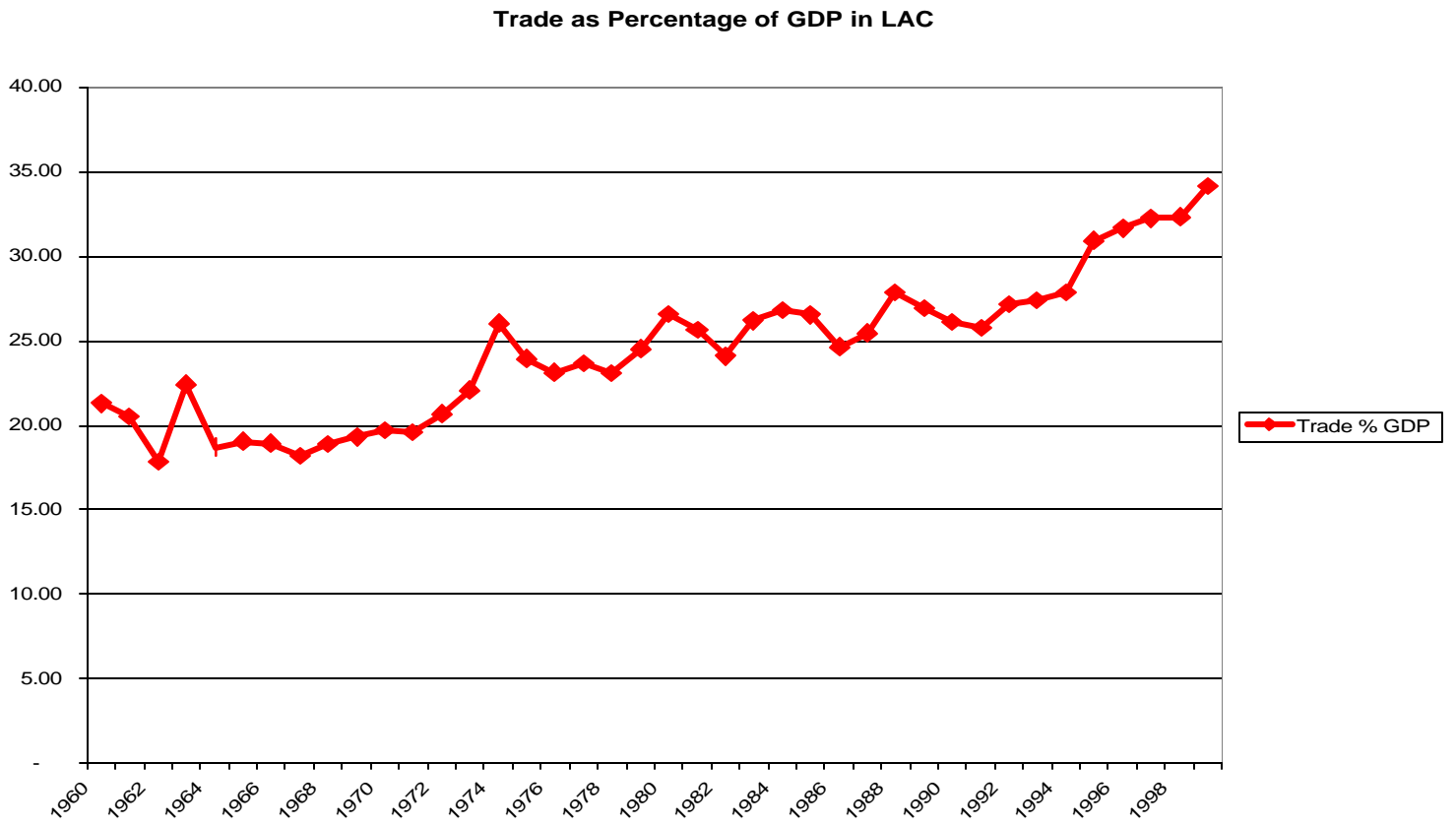


Chart 3

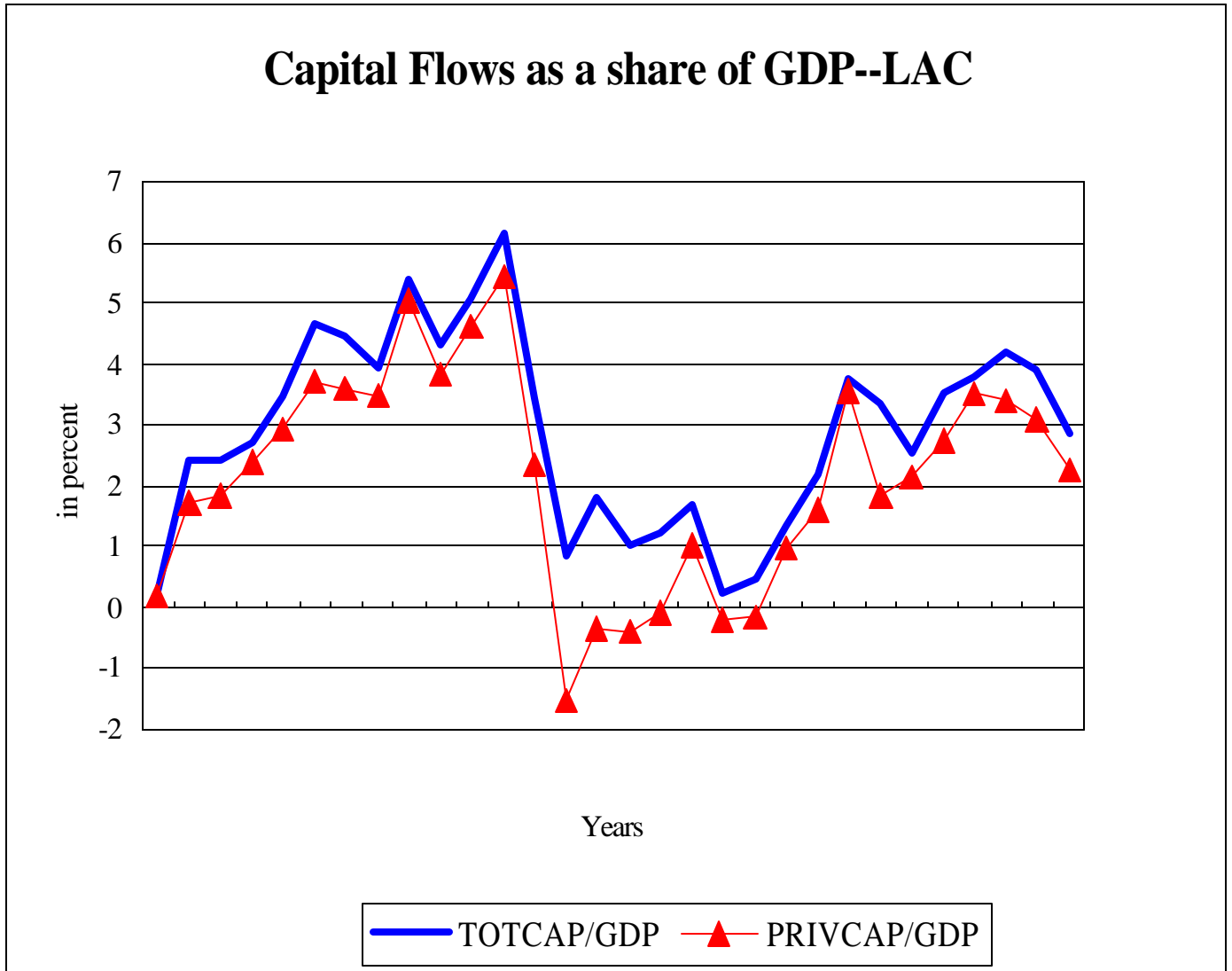


Table 1 Countries and Regions

USA	US
CAN	Canada
MEX	Mexico
XCM	Central America and Caribbean
COL	Colombia
PER	Peru
VEN	Venezuela
XAP	Rest of Andean Pact
ARG	Argentina
BRA	Brazil
CHL	Chile
URY	Uruguay
XSM	Rest of South America
ANZ	Australia and New Zealand
JPK	Japan and Korea
E_U	European Union
CHN	China
IDN	Indonesia
PHL	Philippines
IND	India
ASX	Asia agricultural exporting
OAS	Rest of Asia
EEU	East European and Rest of Europe
TUR	Turkey
NAF	North Africa and rest of Middle East
SFC	South Africa
AFC	Africa food insecure mainly importing from the EU
AFD	Africa food insecure diverse trading partners
ROW	Rest of the World

Table 2 Products

PDR	Paddy rice
WHT	Wheat
GRO	Other grains
V_F	Fruits and vegetables
OSD	Oilseeds
C_B	Sugar cane sugar beet
PFB	Plant-based fibers
OCR	Other crops
CTL	Bovine cattle, sheep and goats, horses
OAP	Other animal products
RMK	Raw milk
WOL	Wool, silk
FRE	Forestry
FSH	Fishing
CMT	Bovine cattle, sheep and goat, meat products
OMT	Other meat products
VOL	Vegetable oils and fats
MIL	Dairy products
PCR	Processed rice
SGR	Sugar
OFD	Other food products
B_T	Beverages and tobacco products
ENG	Energy
OMN	Other minerals
TEX	Textiles
WAP	Wearing apparel
LEA	Leather products
PPP	Wood, paper products, publishing
P_C	Petroleum, coal products
CRP	Chemical rubber plastic products
NMM	Other mineral products
MVH	Motor vehicles and parts
OTN	Other transport equipment
ELE	Electronic equipment
OME	Other machinery and equipment
UTL	Electricity water
CNS	Construction
OSG	Other services and Government

Table 3. Change in real GDP and consumer price index (% change from the base)

	Real GDP		CPI	
	<i>FTAA</i>	<i>FTMEU</i>	<i>FTAA</i>	<i>FTMEU</i>
US	0.77	-0.02	-0.03	0.00
Canada	0.51	-0.01	-0.08	0.00
Mexico	0.60	-0.01	-0.17	0.00
Central America and Caribbean	6.21	-0.03	-1.20	0.01
Colombia	5.48	-0.01	-0.29	0.00
Peru	3.14	-0.01	-0.17	0.00
Venezuela	3.61	0.03	-0.67	-0.01
Rest of Andean Pact	4.16	0.08	-1.30	-0.04
Argentina	3.32	4.35	-0.40	-0.19
Brazil	2.80	2.86	0.08	0.09
Chile	1.82	1.14	-0.33	-0.21
Uruguay	1.26	1.95	-0.24	-0.40
Rest of South America	5.07	5.41	-1.09	-1.62
Australia and New Zealand	-0.03	-0.03	0.00	0.00
Japan and Korea	0.00	-0.01	0.00	0.00
European Union	-0.02	0.34	0.00	-0.01
China	-0.02	0.00	0.00	0.00
Indonesia	-0.06	-0.01	0.02	0.00
Philippines	0.00	0.02	0.02	-0.01
India	-0.05	-0.01	0.01	0.00
Asia agricultural exporting	0.01	0.01	0.01	0.00
Rest of Asia	-0.21	0.04	0.02	0.00
East European and Rest of Europe	0.00	0.01	0.00	0.00
Turkey	-0.04	0.01	0.00	0.00
North Africa and rest of Middle East	0.03	0.04	-0.01	-0.01
South Africa	-0.02	-0.02	0.01	0.00
Africa mainly importing from the EU	0.00	-0.01	0.00	0.00
Africa diverse trading partners	-0.11	-0.09	0.01	0.02
Rest of the World	0.02	0.00	0.00	0.00

Table 4. Decomposition of FTAA effect on real GDP in America (% change from the base)

	<i>Gain/loss from</i>			
	<i>Efficiency</i>	<i>TFP</i>	<i>Employment</i>	<i>Total</i>
US	0.07	0.70	0.00	0.77
Canada	0.08	0.43	0.00	0.51
Mexico	0.16	0.33	0.10	0.60
Central America and Caribbean	2.03	2.83	1.35	6.21
Colombia	0.65	3.89	0.94	5.48
Peru	0.81	1.99	0.34	3.14
Venezuela	1.04	1.96	0.61	3.61
Rest of Andean Pact	1.83	1.95	0.39	4.16
Argentina	0.15	2.42	0.74	3.32
Brazil	0.22	2.22	0.36	2.80
Chile	0.32	0.97	0.54	1.82
Uruguay	0.05	0.79	0.42	1.26
Rest of South America	2.03	1.88	1.16	5.07

Table 5. Change in real wages or employment (% change from the base)

	Unskilled labor		Skilled labor	
	<i>FTAA</i>	<i>FTMEU</i>	<i>FTAA</i>	<i>FTMEU</i>
<u>US and Canada: change in real wages</u>				
US	0.7	0.0	0.7	0.0
Canada	0.5	0.0	0.5	0.0
<u>Other Americas: change in employment</u>				
Mexico	0.5	0.0	0.8	0.0
Central America and Caribbean	4.5	0.0	7.1	-0.1
Colombia	3.6	0.0	5.7	0.0
Peru	1.7	0.0	2.8	0.0
Venezuela	3.0	0.0	3.7	0.0
Rest of Andean Pact	3.4	0.1	5.5	0.1
Argentina	3.9	4.6	3.4	4.1
Brazil	1.4	1.4	2.4	2.4
Chile	1.4	0.8	2.1	1.4
Uruguay	1.4	2.1	1.5	2.4
Rest of South America	4.3	5.2	6.9	8.3
<u>Rest of world: change in real wages</u>				
Australia and New Zealand	0.0	0.0	0.0	0.0
Japan and Korea	0.0	0.0	0.0	0.0
European Union	0.0	0.3	0.0	0.3
China	0.0	0.0	0.0	0.0
Indonesia	-0.1	0.0	0.0	0.0
Philippines	-0.1	0.0	0.0	0.0
India	-0.1	0.0	0.0	0.0
Asia agricultural exporting	-0.1	0.0	0.0	0.0
Rest of Asia	-0.2	0.0	-0.2	0.0
East European and Rest of Europe	0.0	0.0	0.0	0.0
Turkey	-0.1	0.0	0.0	0.0
North Africa and rest of Middle East	0.0	0.0	0.0	0.0
South Africa	0.0	0.0	0.0	0.0
Africa mainly importing from the EU	-0.1	-0.1	0.0	0.0
Africa diverse trading partners	-0.1	-0.1	0.0	-0.1
Rest of the World	0.0	0.0	0.0	0.0

Table 6. Change in total imports and exports (% change from the base)

	Total exports		Total imports	
	<i>FTAA</i>	<i>FTMEU</i>	<i>FTAA</i>	<i>FTMEU</i>
US	1.2	0.0	1.2	0.0
Canada	0.6	0.0	0.8	0.0
Mexico	1.0	0.0	1.4	0.0
Central America and Caribbean	12.1	0.0	7.5	0.0
Colombia	9.8	0.0	7.8	0.0
Peru	9.0	0.0	6.2	0.0
Venezuela	4.8	0.0	6.8	0.1
Rest of Andean Pact	7.8	0.0	7.6	0.2
Argentina	6.6	8.1	6.4	7.8
Brazil	7.3	7.5	4.2	4.2
Chile	3.1	2.0	2.7	1.7
Uruguay	2.4	3.7	2.2	3.4
Rest of South America	7.5	7.0	5.0	6.6
Australia and New Zealand	0.0	-0.1	-0.1	-0.1
Japan and Korea	0.0	0.0	0.0	0.0
European Union	0.0	0.5	0.0	0.6
China	0.0	0.0	-0.1	0.0
Indonesia	-0.1	0.0	-0.2	0.0
Philippines	0.0	0.0	0.0	0.0
India	-0.1	0.0	-0.1	0.0
Asia agricultural exporting	0.0	0.0	0.0	0.0
Rest of Asia	-0.4	0.1	-0.3	0.1
East European and Rest of Europe	0.0	0.0	0.0	0.0
Turkey	-0.1	0.1	0.0	0.0
North Africa and rest of Middle East	0.0	0.0	0.1	0.1
South Africa	0.0	0.0	-0.1	0.0
Africa mainly importing from the EU	0.0	0.0	0.0	0.0
Africa diverse trading partners	-0.3	-0.1	-0.1	-0.2
Rest of the World	0.0	0.0	0.0	0.0

Table 7. Change in total trade by region

	Billion US\$ from base			% change from base		
	Exports	Imports	Total trade	Exports	Imports	Total trade
<i>FTAA</i>						
Americas	29.2	29.7	58.9	2.02	1.85	1.93
Rest of world	-0.3	-0.7	-1.0	-0.01	-0.02	-0.02
Total	28.9	28.9	57.9	0.62	0.62	0.62
<i>FTMEU</i>						
EU-Mercosur	13.6	13.4	27.0	1.17	1.20	1.18
Rest of world	-0.5	-0.4	-0.9	-0.02	-0.01	-0.01
Total	13.0	13.0	26.0	0.3	0.28	0.28

List of Discussion Papers

- No. 40 - "Parameter Estimation for a Computable General Equilibrium Model: A Maximum Entropy Approach" by Channing Arndt, Sherman Robinson and Finn Tarp (February 1999)
- No. 41 - "Trade Liberalization and Complementary Domestic Policies: A Rural-Urban General Equilibrium Analysis of Morocco" by Hans Löfgren, Moataz El-Said and Sherman Robinson (April 1999)
- No. 42 - "Alternative Industrial Development Paths for Indonesia: SAM and CGE Analysis" by Romeo M. Bautista, Sherman Robinson and Moataz El-Said (May 1999)
- No. 43* - "Marketing Margins and Agricultural Technology in Mozambique" by Channing Arndt, Henning Tarp Jensen, Sherman Robinson and Finn Tarp (July 1999)
- No. 44 - "The Distributional Impact of Macroeconomic Shocks in Mexico: Threshold Effects in a Multi-Region CGE Model" by Rebecca Lee Harris (July 1999)
- No. 45 - "Economic Growth and Poverty Reduction in Indochina: Lessons From East Asia" by Romeo M. Bautista (September 1999)
- No. 46* - "After the Negotiations: Assessing the Impact of Free Trade Agreements in Southern Africa" by Jeffrey D. Lewis, Sherman Robinson and Karen Thierfelder (September 1999)
- No. 47* - "Impediments to Agricultural Growth in Zambia" by Rainer Wichern, Ulrich Hausner and Dennis K. Chiwele (September 1999)
- No. 48 - "A General Equilibrium Analysis of Alternative Scenarios for Food Subsidy Reform in Egypt" by Hans Lofgren and Moataz El-Said (September 1999)
- No. 49*- "A 1995 Social Accounting Matrix for Zambia" by Ulrich Hausner (September 1999)

- No. 50 - “Reconciling Household Surveys and National Accounts Data Using a Cross Entropy Estimation Method” by Anne-Sophie Robilliard and Sherman Robinson (November 1999)
- No. 51 - “Agriculture-Based Development: A SAM Perspective on Central Viet Nam” by Romeo M. Bautista (January 2000)
- No. 52 - “Structural Adjustment, Agriculture, and Deforestation in the Sumatera Regional Economy” by Nu Nu San, Hans Löfgren and Sherman Robinson (March 2000)
- No. 53 - “Empirical Models, Rules, and Optimization: Turning Positive Economics on its Head” by Andrea Cattaneo and Sherman Robinson (April 2000)
- No. 54 - “Small Countries and the Case for Regionalism vs. Multilateralism” by Mary E. Burfisher, Sherman Robinson and Karen Thierfelder (May 2000)
- No. 55 - “Genetic Engineering and Trade: Panacea or Dilemma for Developing Countries” by Chantal Pohl Nielsen, Sherman Robinson and Karen Thierfelder (May 2000)
- No. 56 - “An International, Multi-region General Equilibrium Model of Agricultural Trade Liberalization in the South Mediterranean NIC’s, Turkey, and the European Union” by Ali Bayar, Xinshen Diao and A. Erinc Yeldan (May 2000)
- No. 57* - “Macroeconomic and Agricultural Reforms in Zimbabwe: Policy Complementarities Toward Equitable Growth” by Romeo M. Bautista and Marcelle Thomas (June 2000)
- No. 58 - “Updating and Estimating a Social Accounting Matrix Using Cross Entropy Methods ” by Sherman Robinson, Andrea Cattaneo and Moataz El-Said (August 2000)
- No. 59 - “Food Security and Trade Negotiations in the World Trade Organization : A Cluster Analysis of Country Groups ” by Eugenio Diaz-Bonilla, Marcelle Thomas, Andrea Cattaneo and Sherman Robinson (November 2000)
- No. 60* - “Why the Poor Care About Partial Versus General Equilibrium Effects Part 1: Methodology and Country Case” by Peter Wobst (November 2000)

- No. 61 - "Growth, Distribution and Poverty in Madagascar : Learning from a Microsimulation Model in a General Equilibrium Framework " by Denis Cogneau and Anne-Sophie Robilliard (November 2000)
- No. 62 - "Farmland Holdings, Crop Planting Structure and Input Usage: An Analysis of China's Agricultural Census" by Xinshen Diao, Yi Zhang and Agapi Somwaru (November 2000)
- No. 63 - "Rural Labor Migration, Characteristics, and Employment Patterns: A Study Based on China's Agricultural Census" by Francis Tuan, Agapi Somwaru and Xinshen Diao (November 2000)
- No. 64 - "GAMS Code for Estimating a Social Accounting Matrix (SAM) Using Cross Entropy (CE) Methods" by Sherman Robinson and Moataz El-Said (December 2000)
- No. 65 - "A Computable General Equilibrium Analysis of Mexico's Agricultural Policy Reforms" by Rebecca Lee Harris (January 2001)
- No. 66 - "Distribution and Growth in Latin America in an Era of Structural Reform" by Samuel A. Morley (January 2001)
- No. 67 - "What has Happened to Growth in Latin America" by Samuel A. Morley (January 2001)
- No. 68 - "China's WTO Accession: Conflicts with Domestic Agricultural Policies and Institutions" by Hunter Colby, Xinshen Diao and Francis Tuan (January 2001)
- No. 69 - "A 1998 Social Accounting Matrix for Malawi" by Osten Chulu and Peter Wobst (February 2001)
- No. 70 - "A CGE Model for Malawi: Technical Documentation" by Hans Löfgren (February 2001)
- No. 71 - "External Shocks and Domestic Poverty Alleviation: Simulations with a CGE Model of Malawi" by Hans Löfgren with Osten Chulu, Osky Sichinga, Franklin Simtowe, Hardwick Tchale, Ralph Tseka and Peter Wobst (February 2001)
- No. 72 - "Less Poverty in Egypt? Explorations of Alternative Pasts with Lessons for the Future" by Hans Löfgren (February 2001)
- No. 73 - "Macro Policies and the Food Sector in Bangladesh: A General Equilibrium Analysis" by Marzia Fontana, Peter Wobst and Paul Dorosh (February 2001)

- No. 74 - “A 1993-94 Social Accounting Matrix with Gender Features for Bangladesh” by Marzia Fontana and Peter Wobst (April 2001)
- No. 75 - “A Standard Computable General Equilibrium (CGE) Model” by Hans Löfgren, Rebecca Lee Harris and Sherman Robinson (April 2001)
- No. 76 - “A Regional General Equilibrium Analysis of the Welfare Impact of Cash Transfers: An Analysis of Progresa in Mexico” by David P. Coady and Rebecca Lee Harris (June 2001)
- No. 77 - “Genetically Modified Foods, Trade, and Developing Countries” by Chantal Pohl Nielsen, Karen Thierfelder and Sherman Robinson (August 2001)
- No. 78 - “The Impact of Alternative Development Strategies on Growth and Distribution: Simulations with a Dynamic Model for Egypt” by Moataz El-Said, Hans Löfgren and Sherman Robinson (September 2001)
- No. 79 - “Impact of MFA Phase-Out on the World Economy an Intertemporal, Global General Equilibrium Analysis” by Xinshen Diao and Agapi Somwaru (October 2001)
- No. 80* - “Free Trade Agreements and the SADC Economies” by Jeffrey D. Lewis, Sherman Robinson and Karen Thierfelder (November 2001)
- No. 81 - “WTO, Agriculture, and Developing Countries: A Survey of Issues” by Eugenio Díaz-Bonilla Sherman Robinson Marcelle Thomas Yukitsugu Yanoma (January 2002)
- No. 82 - “WTO, food security and developing countries” by Eugenio Díaz-Bonilla, Marcelle Thoms and Sherman Robinson (November 2001)
- No. 83 - “Economy-wide effects of El Niño/Southern Oscillation ENSO in Mexico and the role of improved forecasting and technological change” by Rebecca Lee Harris and Sherman Robinson (November 2001)
- No. 84 - “Land reform in Zimbabwe: Farm-level effects and cost-benefit analysis” by Anne-Sophie Robilliard, Crispen Sukume, Yuki Yanoma and Hans Löfgren (December 2001)
- No. 85 - “Developing country interest in agricultural reforms under the World Trade Organization” by Xinshen Diao, Terry Roe and Agapi somwaru (January 2002)
- No. 86 - “Social accounting matrices for Vietnam 1996 and 1997” by Chantal Pohl Nielsen (January 2002)

- No. 87 - “How China’s WTO accession affects rural economy in the less-developed regions: A multi-region, general equilibrium analysis” by Xinshen Diao, Shenggen Fan and Xiaobo Zhang (January 2002)
- No. 88 - “HIV/AIDS and macroeconomic prospects for Mozambique: An initial assessment” by Channing Arndt (January 2002)
- No. 89 - “International spillovers, productivity growth and openness in Thailand: An intertemporal general equilibrium analysis” by Xinshen Diao, Jørn Rattsø and Hildegunn Ekroll Stokke (February 2002)
- No. 90 - “Scenarios for trade integration in the Americas” by Xinshen Diao, Eugenio Díaz-Bonilla and Sherman Robinson (February 2002)

TMD Discussion Papers marked with an ‘*’ are MERRISA-related. Copies can be obtained by calling Maria Cohan at 202-862-5627 or e-mail: m.cohan@cgiar.org