Journal of Economic Integration
12(3), September 1997; 298–324

Evaluating Integration Choices: The Case of Bolivia

Sarath Rajapatirana*
World Bank

Abstract

Regional integration initiatives have surged in Latin America while many countries have undertaken unilateral trade liberalization and external market access prospects have improved with the successful conclusion of the Uruguay Round. This paper examines and ranks the integration choices faced by one such country: Bolivia. To the extent that different regional trade agreements follow World Trade Organization rules, these agreements could increase market access and allow the countries to realize gains beyond those provided by unilateral liberalization. In this sense, a regional trade arrangement is not inconsistent with multilateral free trade based on the most-favored-nation (MFN) prin-

* Correspondence Address: Economic Advisor in the Operations Policy Department at the World Bank, 1818 H. Street N.W. Washington, D.C. 20433, U.S.A. (Tel) 202-473-9797, (Fax) 202-522-3253; The author wishes to thank Norman Hicks and Demetris Papageorgiou for their comments on an earlier version of the paper without implicating them for any errors that remain. Thanks are also due to Montague Lord of Boye-

ciple. In the final analysis with Bolivia, regional integration is not merely a matter of economics but relates to domestic and regional politics. To this end, MFN trade with concessions from both MERCOSUR and ANDEAN Group ranks best among the choices facing Bolivia. (JEL Classification: F14, F15)

I. Introduction

In the mid 1980s to the 1990s, there have been a spate of regional integration initiatives in many parts of the world. These initiatives have arisen at the same time the Uruguay Round negotiations had been proceeding and when many countries had undertaken unilateral trade liberalization. The integration choices that countries face have to be evaluated in relation to the other two contemporary movements of multilateral trade liberalization under the Uruguay Round and unilateral trade liberalization.

The integration choices are the widest in Latin America. A large number of countries now belong to one trading group or another. Moreover, countries in one group are offered opportunities and choices to join other groups. This paper examines one such case – that of Bolivia. The aim of the paper is to consider a framework to decide on the different integration choices using Bolivia as an example. Of course, these choices cannot be considered in isolation to the remaining trade reform agenda of a country or unrelated to the multilateral trade liberalization. To the extent that the different regional trade agreements follow the World Trade Organization (WTO) rules regarding the regional integration arrangements, these choices are not mutually exclusive. In fact, membership in a regional trading arrangement could facilitate greater access to different markets that could not have been possible by solely depending on multilateral free trade in the context of the most favored nation principle.

resulting improvement in market access for Bolivia and its partners. The present paper attempts to evaluate the different integration choices faced by Bolivia.

Economic integration fundamentally entails reducing barriers to trade within a group of countries compared to those that exist with the rest of the world. A free trade area is characterized by reduction of barriers as well as an adoption of rules of origin to prevent the deflection of trade. A customs union on the other hand has in addition to the reduction of barriers a common external tariff (CET). However, in the process of adopting a CET, a customs union may adopt rules of origin to prevent the deflection of trade in the interregnum

Integration issues are not entirely in the domain of economics. They are very much dependent on regional politics, the relationship with North American neighbors, and domestic political economy considerations. Whatever particular framework is used to rank the choices, the act of integration is ultimately a political act. Only Bolivian policy makers can make that judgment, as they are the legitimate arbitrators of their freedom to choose. However, some exploratory work in delineating the choices could be worthwhile. It is in that spirit the present paper approaches the issue of integration choices.

MFN free trade as theoretical first best is not usurped in the different analytical techniques used in the paper to rank the different trade options. Reducing barriers through regional agreements that allow countries to reduce impediments against each other beyond what can be achieved through multilateral trade negotiations under the auspices of GATT can be called GATT plus trade liberalization. The second ranking is for the option which would give Bolivia membership or associate membership in MERCOSUR, while maintaining preferential access to the Andean Group. The third

ines the integration issues. Section IV analyses the integration choices with different analytical techniques and ranks the choices using both the received economic theory and empirical estimates. Section V summarizes the findings.

II. Trade Composition and Trends

Bolivia's trade is small in relation to Western hemispheric and world trade. The share of Bolivia's exports in Western Hemisphere was 0.66 percent and in world trade 0.03 percent in 1995.[1] It has no monopoly position in trade and as such has to take the terms of trade as given. Tin, its main mineral export, accounts for about 4 percent of the world market for that metal. After the collapse of the Tin Agreement there was no possibility for using that share in concert with other exporters to improve the country's terms of trade. Throughout the eighties Bolivia experienced strong deterioration in the terms of trade. By 1993, terms of trade had fallen to a nearly a third of their level in 1980 (Table 1). Combined with the tremendous macroeconomic imbalance that led to hyperinflation and drastic appreciation of the currency, the adverse terms of trade have reduced the size of Bolivia's tradable sector up to 1985 reforms.

Bolivia's exports fell by 1.1 percent during 1980-1995 with sharp drops in exports in 1981-83 and 1992 (Table 2). Wide variations in the terms of trade were to be expected from a primary product exporter. Its large mineral component is more sensitive to the trade cycle in the importing industrial countries. Its natural gas exports followed the price changes associated with petroleum products after the second oil price shock. Minerals and fuels constitute 65 percent of the country's exports. Non-traditional exports have accounted for 23 percent of the exports and have been growing recently

Table 1
Bolivian Terms of Trade Index, 1980-93
(1987=100)

Year	Export price index	Import price index	Terms of trade index
1980	166.7	96.2	173
1981	133.3	90.4	148
1982	118.3	88.5	134
1983	123.3	86.5	143
1984	111.7	83.7	133
1985	110.0	84.6	130
1986	93.3	93.3	100
1987	100.0	100.0	100
1988	105.0	107.7	98
1989	126.7	109.6	116
1990	93.3	116.4	80
1991	88.3	116.4	76
1992	93.3	119.2	78
1993	78.7	118.3	67

Source: World Bank.

Table 2
Bolivian Imports, Exports, and Growth Rates: 1980-95

Category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Imports	665	976	602	641	562	785	695	737	528	536	568	802	879	980	973	1,108
Import growth	-29%	25%	-49%	5%	-25%	60%	-5%	10%	-26%	0%	9%	35%	8%	2%	-1%	14%
Exports	942	1,140	1,166	1,020	1,082	944	1,139	950	952	1,082	1,654	1,602	1,268	1,486	2,016	2,066
Export growth	14%	-14%	-14%	-12%	-9%	-17%	-7%	-14%	1%	31%	8%	-7%	-19%	3%	36%	2%

Table 3
Bolivia: Direction of Imports and Exports: 1980-95

Category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
Imports																	
USA	25.5	22.9	29.1	28.1	19.9	20.4	22.4	21.0	21.8	24.4	22.2	25.9	24.4	22.5	19.6	22.4	23.3
EEC 10	21.9	19.3	16.7	16.3	14.8	17.3	18.7	14.2	11.8	13.7	13.3	14.7	17.3	16.1	10.1	15.2	15.7
MERCOSUR	22.5	24.6	26.2	28.5	38.2	36.8	29.9	34.6	34.6	32.2	28.2	26.2	24.1	22.9	25.2	21.3	28.5
ANDEAN	4.6	3.7	3.3	3.0	4.9	4.0	2.6	2.0	3.0	3.5	4.2	3.4	3.8	6.6	8.6	8.8	4.3
Others	25.5	29.4	24.7	24.1	22.2	21.5	26.4	28.3	28.8	26.2	32.0	29.8	30.5	31.8	36.4	33.2	28.2
World	654	899	486	531	417	691	674	766	590	620	703	992	1,129	1,177	1,196	1,397	808
Exports																	
USA	29.1	27.6	28.8	23.5	18.6	14.1	15.2	16.9	20.7	19.2	20.0	21.9	20.1	26.6	32.1	28.1	22.6
EEC 10	23.3	20.6	13.9	16.8	22.9	20.5	17.0	21.1	26.9	30.6	28.4	26.3	36.8	32.7	25.8	25.7	24.3
MERCOSUR	27.2	36.1	46.7	49.2	50.0	56.6	57.4	49.2	40.1	33.8	34.5	34.3	22.4	19.1	17.9	14.7	36.8
ANDEAN	4.1	4.5	3.8	2.9	2.0	2.5	3.8	5.4	4.6	6.1	6.5	10.0	13.0	15.4	18.1	18.8	7.6
Others	16.4	11.2	6.8	7.7	6.5	6.3	6.7	7.5	7.7	10.4	10.5	7.5	7.7	6.2	6.2	12.8	8.6
World	1,036	983	896	818	781	673	640	570	597	819	923	900	765	809	1,124	1,181	845

Note: World figures are in millions of current US dollars; other figures are percentages of total. MERCOSUR consists of Argentina, Brazil, Paraguay, and Uruguay. ANDEAN consists of Colombia, Ecuador, Peru, and Venezuela.
Source: United Nations (Comtrade).

tion choices (Table 3). Over the 1980-95 period, 37 percent of Bolivian exports went to MERCOSUR – its main export market. By far, Argentina has been Bolivia's most important trading partner though its importance has declined in recent years. Of the trade with Mercosur, nearly 80 percent consisted of minerals and fuels (SITC group 3, Table 4). In contrast, Bolivia's exports to the Andean Group were only 8 percent of total exports. Those were mainly food, live animals, basic manufactures and crude materi-

Table 4
Exports by Region and Category
1980-95

USA

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	12.9	4.7	5.0	5.6	5.7	7.3	7.0	8.8	10.1	7.3	11.9	8.5	6.6	3.7	4.0	3.1	7.0
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0
2	39.8	32.5	23.7	24.6	20.2	17.7	45.2	54.2	29.3	27.2	24.8	21.1	11.4	13.2	11.6	12.7	25.6
3	0.0	0.0	0.0	15.3	5.0	0.0	3.5	5.5	0.0	0.0	0.0	3.2	0.0	1.6	3.1	11.5	3.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.4	0.4	1.1	0.2
6	47.1	62.6	71.2	54.5	69.0	74.9	39.6	29.7	57.9	61.7	58.0	46.9	49.1	40.7	29.9	33.2	51.6
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	5.5	1.9	1.6	6.2	1.0
8	0.2	0.2	0.1	0.0	0.0	0.1	0.4	0.8	2.2	3.4	4.8	4.2	26.4	38.2	49.2	31.5	10.1
9	0.0	0.0	0.1	0.1	0.0	0.0	3.7	0.7	0.3	0.3	0.2	16.1	0.9	0.3	0.2	0.7	1.5
All	301	272	258	192	146	95	97	96	123	157	185	197	154	215	361	332	199

EEC 10

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	1.2	1.5	3.1	3.4	1.4	4.4	13.5	6.0	6.0	2.8	5.4	1.8	1.8	3.6	8.2	8.0	4.8
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	72.4	54.9	57.5	56.9	56.1	63.7	74.8	84.1	84.3	88.1	84.1	92.9	92.2	65.7	41.4	48.7	69.1
3	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	1.4	0.2
6	21.7	42.8	39.1	39.6	42.5	31.9	11.4	9.8	9.2	8.9	9.8	4.8	5.5	8.2	8.1	5.1	18.6
7	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0
8	0.7	0.7	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.4	0.2	0.4	0.6	1.1	1.0	0.8
9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.0	22.0	41.1	35.9	6.6
All	241	202	125	137	179	138	109	120	161	251	263	236	282	265	290	303	206

MERCOSUR

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	0.8	0.4	0.5	0.6	0.6	0.4	4.3	3.7	2.4	8.7	17.2	9.9	1.5	3.3	9.9	6.9	4.4
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.3	0.2	0.6	1.6	0.2
2	17.2	3.1	3.2	1.9	1.1	1.0	4.6	6.2	6.1	9.7	7.8	8.4	19.7	24.2	28.5	18.3	10.1
3	79.0	94.2	94.2	96.0	97.5	98.4	89.6	88.7	89.9	77.3	70.7	75.3	72.5	61.0	47.2	57.7	80.6
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0	0.1	0.5	0.1
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.9	0.5	0.5	0.5	0.2	0.3	0.2
6	2.9	2.3	2.0	1.5	0.7	0.1	1.5	1.3	1.5	4.0	2.6	2.0	1.6	3.8	3.8	4.0	2.2
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	4.2	7.3	8.1	1.4
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.7	2.7	2.2	2.3	0.5
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	2.7	0.1	0.1	0.1	0.2	0.1
All	282	355	418	402	390	381	368	280	239	276	319	309	171	154	201	173	295

ANDEAN

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	14.9	8.6	26.7	34.4	22.3	37.7	37.5	42.8	36.0	57.4	62.5	50.1	49.0	50.9	42.1	23.9	37.3
1	2.2	1.4	3.9	1.4	0.0	0.5	1.1	0.8	0.0	0.4	0.4	0.2	0.1	0.3	0.1	0.1	0.8
2	1.5	3.0	4.0	2.6	12.9	6.3	34.8	24.1	24.3	15.7	15.7	24.6	22.7	26.4	35.8	49.9	19.0
3	10.3	0.0	0.0	20.6	0.0	0.0	0.0	7.3	13.4	0.0	0.0	0.0	0.0	0.5	0.4	2.0	3.4
4	0.0	3.0	1.5	0.2	0.0	0.2	0.8	0.5	0.0	4.8	9.6	7.3	5.2	4.4	10.0	13.6	3.8
5	0.0	18.5	3.8	0.1	0.7	0.4	4.2	4.9	0.7	9.6	1.3	1.6	2.0	2.3	1.6	1.3	3.3
6	45.7	44.9	45.1	40.6	63.9	54.7	21.4	19.4	25.2	12.1	10.4	7.7	12.8	10.2	6.1	6.0	26.6
7	24.6	19.3	13.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	6.8	3.2	3.0	1.0	4.5
8	0.9	1.3	1.8	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.2	1.2	1.7	0.8	2.0	0.7
9	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.3	0.1	0.0	8.3	0.2	0.1	0.1	0.1	0.6
All	43	44	34	24	16	17	24	31	28	50	60	90	99	125	203	222	69

World

Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.

Notes: 0 food and live animals; 1 beverages and tobacco; 2 crude materials, excluding fuels; 3 mineral fuels etc.; 4 animal, vegetable oil, fat; 5 chemicals, related products; 6 basic manufactures; 7 machines, transport equipment; 8 misc. manufactured goods; 9 goods not classified by kind.

Note: Figures for all commodities are in millions of US dollars. The rest are percentages.

Source: United Nations (Comtrade)

Table 5
Commodity Composition of Bolivian Imports, 1980-95

USA																		
Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	21.2	10.6	17.4	30.7	20.2	9.2	27.3	32.7	21.8	31.4	26.9	17.9	18.5	16.2	11.2	14.4	20.5
1	1.2	1.3	0.9	0.7	0.7	0.2	0.3	1.2	0.8	1.0	0.9	0.4	0.2	0.4	0.4	0.5	0.7
2	1.6	1.7	2.2	2.0	4.8	3.0	2.0	1.6	1.3	1.1	1.4	1.7	1.4	1.4	2.0	2.0	2.0
3	0.4	4.2	1.7	1.8	0.8	0.9	1.3	0.4	3.5	0.7	0.8	1.0	3.2	4.1	3.3	2.3	1.9
4	1.2	0.7	0.9	1.3	0.2	1.1	2.5	1.4	0.8	2.4	1.9	0.6	0.8	0.1	0.0	0.0	1.0
5	8.0	9.3	6.6	13.7	12.8	10.6	7.3	8.4	8.0	5.9	7.0	8.0	7.0	9.8	14.9	15.0	9.5
6	13.8	17.7	16.3	7.6	11.6	12.4	9.5	8.1	11.1	9.7	7.7	8.9	8.1	9.3	11.0	9.6	10.8
7	47.6	46.6	49.6	38.6	41.9	54.4	42.4	37.6	42.3	40.0	41.4	41.0	43.2	44.3	43.7	46.1	43.8
8	4.9	7.8	4.4	3.6	7.0	7.9	6.7	7.8	9.8	7.5	10.2	10.4	7.7	7.3	8.0	7.4	7.4
9	0.0	0.1	0.1	0.0	0.0	0.5	0.7	0.9	0.6	0.5	1.7	10.1	9.8	7.1	5.5	2.8	2.5
All	167	206	142	149	83	141	151	161	129	151	156	257	275	265	235	313	186
EEC 10																	
Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	14.1	15.2	15.3	11.5	10.8	8.6	7.6	12.7	9.3	17.8	8.1	11.3	7.2	6.5	22.9	6.9	11.4
1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.4	0.5	0.2	0.2	0.6	0.6	0.2
2	1.8	2.2	1.6	1.1	0.9	1.9	1.6	4.1	2.9	4.1	4.2	1.6	0.8	0.7	0.9	0.5	2.1
3	0.7	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.0	1.2	0.0	0.2	0.1	0.3
4	0.3	0.3	0.4	0.2	0.1	0.5	0.5	8.6	0.7	2.9	0.3	1.2	1.7	0.6	0.1	0.1	1.1
5	20.6	19.3	22.9	19.5	28.3	19.1	17.8	16.4	22.8	19.7	19.4	16.3	8.0	6.1	19.4	14.1	18.5
6	11.1	12.6	12.5	9.5	9.0	9.0	10.9	7.9	14.1	8.6	12.0	24.4	11.4	4.4	8.6	5.6	10.1
7	45.2	45.0	30.7	47.1	37.5	33.8	40.9	40.4	40.4	36.1	39.5	35.8	56.9	77.8	39.9	66.1	45.1
8	6.0	4.5	16.3	10.8	12.8	25.9	20.0	7.2	8.8	9.6	8.7	8.9	12.6	3.1	6.6	5.7	10.3
9	0.0	0.4	0.0	0.0	0.1	0.8	0.5	2.2	0.6	0.6	7.0	0.0	0.0	0.6	0.8	0.2	0.9
All	143	174	81	87	62	120	126	109	70	85	94	146	195	190	121	212	126
MERCOSUR																	
Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	23.9	19.6	28.9	22.1	20.5	30.9	9.2	13.1	7.5	9.0	5.6	8.7	11.3	7.8	9.5	7.2	14.7
1	0.7	0.5	0.2	1.0	0.2	0.3	0.3	0.7	1.2	1.0	0.8	1.3	0.6	1.2	1.0	0.9	0.8
2	1.7	2.2	1.5	2.1	2.0	2.0	1.2	1.2	0.7	0.7	0.8	1.3	0.7	1.7	1.0	1.4	1.4
3	0.7	1.0	5.0	1.1	0.8	0.6	0.4	0.4	0.3	1.4	0.3	0.8	4.9	10.6	12.1	14.7	3.4
4	4.3	4.2	3.5	3.6	1.2	3.3	0.5	0.4	0.7	0.6	0.1	0.2	0.9	0.6	0.1	0.0	1.5
5	5.1	4.3	6.6	10.6	7.8	7.7	8.4	8.8	11.6	9.9	10.4	12.6	9.2	13.2	12.7	15.3	9.6
6	20.4	25.0	27.8	36.0	25.6	16.9	30.5	29.9	29.1	35.6	35.2	36.0	36.0	32.0	28.5	27.3	29.5
7	38.5	39.1	24.9	21.6	40.7	36.4	45.0	39.8	43.1	36.3	41.6	34.6	32.1	28.2	30.6	29.6	35.1
8	4.8	4.1	1.7	2.0	1.2	1.7	4.4	5.6	5.7	5.4	5.2	4.5	4.4	4.6	4.5	3.6	4.0
9	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	147	221	127	152	159	254	201	265	204	199	198	260	272	270	301	298	221
ANDEAN																	
Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.
0	21.0	13.9	9.9	7.4	13.7	8.0	8.3	8.6	5.8	4.3	5.6	5.0	4.2	5.6	6.5	7.0	8.4
1	1.0	0.6	1.1	1.2	0.2	0.0	0.2	0.4	0.0	0.1	0.2	0.0	0.4	0.1	0.1	0.1	0.4
2	0.9	0.8	0.9	17.4	20.3	10.7	20.0	10.7	13.7	12.5	12.2	7.7	24.2	29.2	24.8	27.4	14.3
3	0.3	0.6	1.1	0.5	0.1	0.8	0.3	1.4	0.1	0.3	0.4	0.7	9.8	7.4	7.4	9.0	3.6
4	1.7	0.0	0.1	0.0	0.0	0.0	0.5	0.4	0.0	0.2	0.1	0.0	0.0	0.0	0.2	0.2	0.2
5	29.4	33.1	37.7	28.1	20.1	15.6	17.8	26.4	24.3	32.7	26.6	28.8	22.0	22.8	25.6	24.0	25.9
6	25.8	29.1	27.7	27.9	20.2	18.2	20.1	30.1	25.4	28.6	23.9	31.0	20.7	19.2	21.1	26.6	24.7
7	14.2	17.2	18.7	12.1	21.1	42.8	25.0	11.7	21.8	11.2	19.0	17.5	13.2	7.6	6.7	5.6	16.6
8	5.7	4.7	2.9	5.3	4.2	3.4	7.4	9.8	8.2	9.2	12.0	9.4	5.3	8.1	5.7	5.6	6.7
9	0.0	0.0	0.0	0.1	0.0	0.5	0.4	0.6	0.7	0.8	0.0	0.0	0.0	0.0	0.3	0.0	0.2
All	30	33	16	16	20	28	17	15	18	22	30	33	42	77	103	111	38
World																	
Commodity	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Avg.

Notes: 0 food and live animals; 1 beverages and tobacco; 2 crude materials, excluding fuels; 3 mineral fuels etc.; 4 animal, vegetable oil, fat; 5 chemicals, related products; 6 basic manufactures; 7 machines, transport equipment; 8 misc. manufactured goods; 9 goods not classified by kind.

Note: Figures for all commodities are in millions of US dollars. The rest are percentages.

Source: United Nations (Comtrade)

centrated by markets; MERCOSUR, USA and EU and account for more than 80 percent of the total exports. Third, export revenues are subject to wide fluctuations in prices that are linked to the changes in the trade cycle. Finally, while there has not been a very significant shift in the composition of exports despite the recovery in trade after 1985, there has been some changes in destination. In particular, the share of Bolivia's exports to the Andean group has increased while the share to MERCOSUR has declined. This has been primarily due to the decline in natural gas exports to Argentina and the increase in soy exports to Colombia in recent years.

Bolivia's imports are dominated by machinery, transport equipment, basic manufactures, food and live animals (Table 5). Imports grew by 2.0 percent during 1980-95. As in the case of exports, the average growth rate masks large variations in imports. The variation on imports has been even larger than that of exports, reflecting the vulnerability of imports to macroeconomic developments. Thus, for example, there were huge cuts in imports in 1982 following the macroeconomic and debt crisis (Table 2). Following the stabilization program there was a strong recovery in imports from a very low base. Imports are more diversified compared to exports (Table 5). This is the usual pattern of trade for countries that have commodity concentrations in their exports. Some 28 percent of imports to Bolivia originate in MERCOSUR. These imports are machinery, transport equipment, manufactures, and basic equipment – much like the pattern of Bolivia's imports from other countries. While 23 percent of Bolivia's imports originate from the U.S., 16 percent from the EU and 28 percent of imports come from the rest of the world. The Andean Group accounts for roughly 4 percent of Bolivian imports and these consist of basic manufactures, machinery and chemicals. As in the case of exports, the composition of imports has remained stable over 1980-95. Also, the share of Andean group

Third, import prices have been on a rising trend despite the increasing diversity of imports.

Trends in trade indicate an improvement following the 1985 reforms under the New Economic Policy. The hyperinflation of that year led to a tremendous appreciation of the exchange rate and created huge disincentives for export. The contraband trade rose rapidly. Export growth recovered with the radical fiscal reforms that were part of the adjustment program that led to impressive stabilization of the economy. Consequently, there is a significant difference in trade trends before and after the reforms. These emanate from the macroeconomic stabilization as well as from the trade reforms. This latter aspect is discussed in the next section. During 1985-95, export growth recovered and reached 1.5 percent per annum compared to a decline of 7.0 percent per annum during 1980-84 (Table 2). Similarly, import growth recovered to 9.6 percent per annum during 1985-95 compared to the sharp decline of 14.6 percent per annum during 1980-84. The recovery in imports resulted from the recovery in income, trade liberalization, and in particular due to the elimination of quantitative restrictions. Of course it is difficult to disentangle the efforts of the macroeconomic stabilization from the trade liberalization as far as the trade recovery is concerned. Clearly, both helped.

III. Integration Choices

The pursuit of different choices for integration will have profound implications for Bolivia's trade and welfare. However, Bolivia faces two choices which may not be mutually exclusive. The first is to pursue MFN trade taking advantage of the new, global market access. This may be done by entering into agreements within the framework of what can be called "GATT-

MFN trade is not inconsistent with regional agreements under a GATT-plus approach. Bolivia has four basic integration choices between integration with the rest of the world and within the region itself. These choices emerge when they are narrowed down to the most practical choices. Other more exotic choices would exist such as joining NAFTA or other emerging agreements. But they seem somewhat removed from reality at this time. These are: (a) pursuing of MFN trade in addition to regional agreements to increase access in a "GATT plus" sense; (b) joining MERCOSUR and maintaining duty free status in the Andean Group; (c) remaining within the Andean Group and receiving additional market access concessions from MERCOSUR; and (d) remaining within the Andean Group and implementing the current trade agreements.

A. Pursuing MFN Trade with Regional Agreements to Increase Access in GATT-plus Sense.

One of the important arguments for pursuing regional trading agreements had been the doubts regarding the success of the Uruguay Round. These have now been removed with the successful signing of the Uruguay Round agreement. Industrial country tariffs have been lowered, non-tariff barriers are being phased out and dispute settlement procedures have been strengthened. Meanwhile, the ability to free-ride through breaches of reciprocity has also been reduced. Article XXIV provisions have been defined better, so that future agreements will be scrutinized more closely and the sanctioned departures from the MFN will be enforced more strictly with the WTO having the power to enforce rules better than under the GATT.

In addition to the changed international trading environment, Bolivia has become a model member since joining the GATT in 1990 in following the

The other advantage of MFN trade is that is it is an antidote against domestic protectionist interests that would use the departures from the MFN principle in exchange for concessions to influence trade policies. Such sector related influences would detract rather than enhance national welfare. This is the reason why Article XXIV of the GATT postulates that regional trade agreements must be based on across the broad negotiations, so as to reduce the possibility of domestic sector related interests capturing the negotiations process and influencing the exchange of concessions to increase private profits at the expense of national welfare.

While MFN trade is optimal, there are opportunities to enhance trade beyond what could be achieved under MFN trade. With the low level as well as variance in border protection, Bolivia could be said to have reached as close to a minimum level of protection as possible, given the domestic interests. However, providing duty free access beyond what could be achieved under MFN trade at this time could be considered as GATT-plus trade. Thus the low protection and the zero tariff access granted to Andean Group members increases domestic competition beyond what seem possible thorough MFN trade at this time. This is not to say there is a lower bound for protection and that such a threshold has been reached by Bolivia. In the same way that there is no lower bound for protection, there is also no upper bound for access to other markets.

B. Joining MERCOSUR and Maintaining Duty Free Status Accorded to the Andean Group

Bolivia has made individual agreements with the four MERCOSUR countries. These agreements specify a phased reduction of trade barriers faced by Bolivia, and an agreed list of goods that can have zero or low tariffs.[2]

lists as well as four different rates of convergence to the finally agreed list of preferences. For example, one type of good permitted at zero tariff from one country may not be eligible for such status from another. Also, the goods excluded from preferences at the moment could be eligible for concession in the future. These complications arising from the different preferences and the changes in preferences over time can be quantified to be more than sixty thousand individual tariff lines. With some ten thousand tariff lines for each country going down to four digit levels, the tariff schedules of the six countries implies some sixty thousand country and commodity specific tariff lines. This also indicates the discretion accorded to customs administration. Items could be excluded or included from this list at a given point in time. This leads to wide margins of discretion in classification and opportunities for corruption.

Since Bolivia has six agreements outside of the Andean group, an import from abroad has to be classified by origin for customs purposes, then item must be checked to see whether it is in the list for preferences and the list has to be updated each time the preference lists are increased.

Since membership in one group or other is in large part a political act, joining MERCOSUR may imply loss of some preferential access to the other Andean Group countries. Besides, the CET rates of MERCOSUR is 20 percent while the Andean Group has a CET structure of 5 percent, 10 percent, 15 percent and 20 percent. The actual conditions of access would depend on the agreements to be made in terms of the CET, the implementation of the preferences with MERCOSUR countries and arrangements that are permissible for Andean Group countries to join other groups.

C. Remaining within the Andean Group and Receiving Additional Market Access Concessions from MERCOSUR.

what it has already negotiated in its individual agreements with the MERCOSUR countries is the main issue to be considered under this option. Where trade is concerned two additional concessions can be considered. The first option is to increase the coverage of goods that enter MERCOSUR duty free and in return provide additional access for MERCOSUR countries to the Bolivian market. The second one would be to accelerate the rate at which Bolivia will open its market to MERCOSUR under the current agreements.

One of the challenges of partnership in the same agreement is the need to coordinate regulatory, legal and investment policies to assure investors within the group. Remaining within the Andean Group may not provide sufficient confidence to MERCOSUR investors as joining MERCOSUR. In addition, the extent of trade with the Andean Group continues to be relatively small. On an average, it has been less than 6 percent of Bolivia's trade over the last three years. Finally, the negotiation of additional concessions would give further opportunities to domestic sector related interests in both Bolivia and MERCOSUR to influence the trade regime adversely. If the lobbying power of the export interests were to be less than that of those producing import substitutes, the new negotiations could raise import protection.

D. Remaining within the Andean Group and Implementing the Current Trade Arrangements.

This option implies maintaining the status quo. It means however that Bolivia has to adopt the Andean Group's CET, even though it has received a temporary respite from adopting the CET. Consequently, Bolivia would have to raise its import tariffs in the future, unless the Andean Group were to

ed with the implementation of rules of origin will remain high and unabated.

Finally, maintaining the status quo implies that Bolivia will not be taking advantage of the new opening of markets outside the Latin American continent offered by the Uruguay Round. Also, taking the status quo option implies foregoing other options discussed above. It would also mean foregoing the opportunities to attract more private investment into the country with greater trading opportunities with the rest of the world and adopting regulatory and investment rules that are attractive to the rest of the world. In addition, failing to take advantage of the trading opportunities would mean that the present problems, such as the lack of diversification, presence of illegal trade and administrative costs of implementing the divergent preference regimes would continue. All these factors could detract from welfare.

IV. Quantitative Analysis of the Integration Choices

A quantitative analysis of integration choices for Bolivia must recognize the existence of contraband trade as an initial condition. The changes in trade flows following an integration agreement will depend on the level and composition of existing trade, both legal and contraband trade. To the extent that trade barriers are reduced among the trading partners contraband trade should be discouraged.

In what follows, we have attempted to estimate the extent of contraband trade based on the trade reporting system of partner countries. Using trade data, smuggling indexes were constructed for Bolivia's trade with MERCOSUR and the Andean Group. These indexes were calculated for exports as well imports. The key to the exercise is to compare the recorded exports (imports) of Bolivia to the reported imports (exports) from Bolivia in MER-

Table 6
Smuggling Indexes: 1980-1995

	Imports Smuggling Index(S_m)	Imports Correlation Coefficient	Exports Smuggling Index(S_x)	Exports Correlation Coefficient
Bolivia-Andean Group	0.04	0.675	0.30	0.969
Bolivia-MERCOSUR	0.29	0.798	0.12	0.973

Source: Author's calculations

trade accounts and M_{mb} are imports reported by MERCOSUR countries as originating from Bolivia. The higher the value of the index, the greater the level of smuggling. If smuggling were equal to zero, ceteris paribus, $X_{bm} = M_{mb}$, and $S_x = 0$.

A similar index, Sm, can be constructed for Bolivia's imports.

$$S_m = 1 - (M_{bm} / X_{mb}) \qquad (2)$$

where M_{bm} are imports from MERCOSUR recorded by Bolivia in its trade accounts and X_{mb} are exports to Bolivia reported by MERCOSUR countries in their accounts. As before, if smuggling were equal to zero, ceteris paribus, $M_{bm} = X_{mb}$, and $S_m = 0$.

This exercise has been repeated for the Andean Group. The comparative results are shown in Table 6.

The results give an average smuggling index of 0.12 for Bolivia's exports to MERCOSUR. This is reinforced by the fact that during this period the correlation coefficient between exports reported by Bolivia and the imports reported by MERCOSUR is 0.97. This indicates that nearly all of the trade is reported; in other words, the smuggling associated with Bolivia's exports to

tion coefficient is 0.68.

To summarize the results of the smuggling indexes, it is clear that smuggling is still taking place despite Bolivia's trade liberalization. Moreover, a distinction exists between Mercosur and the Andean Group as with the import smuggling index higher for Mercosur and the export smuggling index higher for Andean group. In part, this probably reflects the fact that Bolivia's border with MERCOSUR covers a wider distance than its border with the Andean Group, and hence, smuggling is easier. These indexes may reflect both actual smuggling as well as under reporting. Illegal trade, such as narcotics, is not recorded so that the indexes underestimate the total contraband trade. The implication of the indexes is that with trade barriers reduced between Bolivia and Mercosur, smuggling of legal goods can decline. The analyses also shows that this decline will be more on Bolivia's imports than exports.

Integration Choices

In order to delineate the integration choices, three methods were used. These were the estimation of export demand functions for Bolivia using ordinary least squares (OLS), construction of trade compatibility indexes and the estimation of a demand function for Bolivia's exports using an error correction model (ECM) for the 1980-1993 period.

1. Export Demand Functions Using OLS: In order to examine the integration choices, three general export demand functions were estimated with OLS regressions. It should first be noted that these regressions are hindered by several factors. Midway through the period of analysis, Bolivia shifted to a more liberal trade policy regime. Hence, in these regressions, we are handicapped by fitting a model to data operating under two separate

Table 7
Export Demand Regression Results for Bolivia's Exports to MERCOSUR, Andean, and World: 1980-1995 (using first differences)

	Intercept	d[Log(RER)] (RER=RER_{Ptr}/ RER_{Bol})	d[Log(M_P)] (M_p=Partner Imports from World)	Adjusted R^2
Mercosur	–0.009 (0.14)	0.027 (0.16)	–0.009 (0.02)	0.002
Andean	0.101 (1.38)	0.341 (0.23)	0.190 (0.54)	0.032
World	–0.54 (0.93)	0.007 (0.05)	1.040 (1.85)	0.092

Note: t-values are shown in parentheses d [...] indicates use of first differences
Source: Author's calculations

errors. And finally, regression models based on time series estimates are subject to Lucas [1976] critique that estimated coefficients are not reliable for prediction because of changes in the underlying structures. For our purposes, these regressions can nonetheless serve as a basis for more sophisticated methods of inquiry regarding the different integration choices.

The three OLS export demand functions were the demand for Bolivia's exports from the world,[5] MERCOSUR and the Andean Group. The export demand function estimated was of the form,

$$\text{Log } X = a_0 + b_1 \log(RER) + b_2 \log(M_f) \qquad (3)$$

where X is exports form Bolivia to partner country, RER is the ratio of real exchange rates between Bolivia and partner countries,[6] which is a proxy for the relative price variable and M, total import demand of the target market used as a proxy for demand in that market. Since the analysis involves time

formed using the first differences of the series in equation 3.

The results of the first difference regressions are shown in Table 7. Using first differences, the export demand regression have low goodness of fit indicators. Among all the different regressions, the only marginally significant variable is the world import demand in the OLS of Bolivia's exports to the world. With Mercosur and the Andean group, there were no clear export demand linkages. The results do not contradict the ranking of unilateral liberalization with the world first, followed by Mercosur and the Andean group.

2. Trade Compatibility Indexes: A second method was used to analyze the compatibility of Bolivia's integration with MERCOSUR and the Andean Group. This was done by constructing compatibility indexes.[7] These indexes indicate the compatibility of a given country's imports (exports) with the partner country exports (imports). In the present context, an attempt is made to assess the compatibility of Bolivia's imports (exports) with MERCOSUR and Andean Group exports (imports). Take for instance, the index of compatibility of country j's imports with the exports of country k. (See Appendix which illustrates a 3 country, two commodity case) This can be defined as:

$$S_{m_j x_k} = 1 - ((\Sigma \left| m_{ij} - x_{ik} \right|)/2) \qquad (4)$$

where $S_{m_j x_k}$ is the index of compatibility of imports of country j with exports of country k, m_{ij} is the share of good i total imports of country j and x_{ik} is the share of good i in total exports of country k.

The range of values for the index is between zero and one.[8] It will be zero when trade flows are not compatible, implying that trade flows are highly dissimilar and the index would be one when trade flows match fully implying perfect compatibility or identical flows. In the Bolivia-MERCOSUR case,

Table 8
Indexes of Trade Compatibility: 1980-1995

Bolivian Exports	Andean Imports 0.339	MERCOSUR Imports 0.464
Bolivian Imports	Andean Exports 0.353	MERCOSUR Exports 0.608

Note: Computed on the basis of 2-digit SITC data.
Source: Comtrade database, UN

compatibility index were to approach one. It should be noted that the matches are examined for separate commodity groups. Therefore, examination of the compatibility issue by commodity groups is necessary.

The second index of compatibility assess the compatibility of country j's exports with the imports of country k. This index is computed in a similar fashion to the one earlier and is defined as:

$$S_{x_j m_k} = 1 - ((\sum |x_{ij} - m_{ik}|)/2) \qquad (5)$$

where $S_{x_j m_k}$ is the index of compatibility of exports of country j with imports of country k, x_{ij} is the share of good i total exports of country j and m_{ik} is the share of good i in total imports of country k. The results are shown in Table 8.

As Michaely [1994] has shown, the first index relating Bolivia's imports (exports) to the exports (imports) of MERCOSUR and the Andean Group also indicates the potential for trade diversion. Trade diversion takes place when there is a substitution of production within a group for a cheaper source of imports from outside the group, due to the cost differential created by the preference margin.

To the extent that the trade flows are correctly reported and that trade

regional groupings, the supply side implications could be determined. But this is a highly data intensive task. It is not attempted here. There are also other methods to evaluate supply responses to economic integration using computable general equilibrium models. Such models can be subjected to strong criticisms as to their predictive power, though they might serve well as a consistency check.[9]

3. Estimating Demand Functions Using an Error Correction Model: A third method was used to rank Bolivia's integration choices utilizing an Error Correction Model (ECM). This was done as a modification of the OLS regressions that were used to estimate Bolivia's export demand functions. However, unlike the OLS regressions, the ECM regressions explicitly incorporated aggregate demand (GDP) of the partner country. By incorporated the error correction term, the model also captures the residual of the dynamic relationship between Bolivian exports and partner country aggregate demand. Thus an error correction model was estimated of the form:

$$\Delta x_{ijt} = \alpha_0 + \alpha_1 \Delta y_{jt} + \alpha_2 (y_j - x_{ij})_{t-1} + \alpha_3 \Delta e^r_{ijt} \qquad (6)$$

where lower-case letters denote the logarithms of the corresponding capitals. The expected signs are $\alpha_1 > 1$, $0 < \alpha_2 < 1$, and $\alpha_3 > 0$. The variable X_{ij} refers to exports of country i to market j, Y_j refers to the real GDP of market j, and e^r_{ij} refers to the real exchange rate between country i and market j.[10]

Like the OLS regressions, the ECM regressions are subject to the same time-series caveats. Unlike the OLS regressions, the use of the ECM explicitly calls for the use of first differences. First differences were justified by the test for unit roots; the levels of the series were integrated of order one,

Table 9
Error Correction Model Regression Results for Bolivia's Exports to MERCOSUR, Andean, and World: 1980-1995

$d[\log(X_{Bol\ to\ Ptnr,})]$	Mercosur	Andean	World
Intercept	0.470 (0.51)	0.016 (0.01)	–2.655 (2.17)
$d[\log(GDP_{Ptnr})]$	2.603 (2.24)	0.993 (0.51)	–0.369 (0.26)
$d[\log(RER_{Bol}/RER_{Ptnr})]$ *for World*, $d[\log(RER_{Bol})]$	0.074 (0.15)	0.353 (1.45)	–0.024 (0.15)
$d[\log(GDP_{Ptnr,-1} - \log(X_{Bol\ to\ Ptnr,-1})]$	–0.080 (0.12)	0.006 (0.04)	0.271 (2.15)
Adjusted R^2	.12	.00	.13

Note: *t*-values are shown in parentheses. $d[...]$ indicates use of first differences
Source: Author's calculations

The estimated equation for Bolivia's export demand by MERCOSUR is:[11]

$$\Delta x_{ijt} = \underset{(0.51)}{0.47} + \underset{(2.24)}{2.60}\Delta y_{j,t} - \underset{(0.12)}{0.08}(y_j - x_{ij})_{t-1} + \underset{(0.15)}{0.07}\Delta e_t$$

Adjusted $R^2 = 0.12$

The estimated equation for Bolivia's export demand by Andean is:

$$\Delta x_{ijt} = \underset{(0.01)}{0.02} + \underset{(0.51)}{0.99}\Delta y_{j,t} - \underset{(0.04)}{0.01}(y_j - x_{ij})_{t-1} + \underset{(1.45)}{0.35}\Delta e_t$$

Adjusted $R^2 = 0.00$ +

The estimated equation for Bolivia's export demand by the World is:

shows a positive and significant relationship between aggregate demand and the level of imports from Bolivia. For the world only the error correction term as significant. No significant relationships are found in the regressions involving the Andean Group. The results support the view that an agreement with MERCOSUR could generate more exports compared to that with the Andean Group.

The main conclusion from the analysis of different integration choices is that integration with the world, the theoretically best option, is not contradicted in the different analyses conducted above. In other words, MFN trade based on low tariffs would secure both the growth and diversification benefits that Bolivia is seeking from its trade opportunities. Besides, MFN trade is not exclusionary. With low protection based MFN trade, Bolivia would be able to exploit the trade opportunities provided by preferences exchanged between MERCOSUR and the Andean Group. While the analysis is not always clear on this choice, it seems the most sensible both in term of international trade theory and the empirical results, though the latter is not overwhelming. In any case, the evidence does not contradict the superior nature of MFN trade based on low protection.

The empirical results indicate that the choice of MERCOSUR has to be ranked above the Andean Group, at least for economic reasons. The numbers certainly support that choice. There is also great plausibility to that choice. MERCOSUR is larger, closer and has a pattern of trade compatible with Bolivia. It is expected to grow steadily, especially if the macroeconomic stability of Argentina and Brazil were to hold up.

The consequences of remaining within the Andean Group and receiving concessions from MERCOSUR were not specifically modeled. However, the results from the other regressions and the compatibility tests seems to support a ranking of this choice above the status quo, which is remaining with-

of trade. However, opportunities to increase the international competitiveness of the economy remain relatively unexploited. Integration may constitute one such means to increase competitiveness.

In terms of Bolivia's integration choices, theoretical arguments as well as the three types of empirical analysis undertaken, broadly confirm that MFN-based trade combined with preferential access to MERCOSUR and the Andean Group is superior to other choices. Of the other three integration choices, joining MERCOSUR in some form and maintaining the Andean Group concessions is ranked above that of remaining in the Andean Group and receiving concessions from MERCOSUR. The essential difference between the two choices is that MERCOSUR is a larger market, and the tie-in with it in respect of trade as well as other regulatory and legal environments will provide some credibility to the efforts of the Bolivian government to attract investment from MERCOSUR. The status quo of remaining within the Andean Group and maintaining the existing preferences is ranked last.

The maintenance of preference regimes is not without costs. The administration of the rules of origin associated with preferences granted to other countries would operate as a non-tariff barrier when Bolivia has strongly forsaken similar barriers in its trade policy.

In the final analysis, integration choices are not merely a matter of economics but very much related to domestic and regional politics. Domestic political interests are aligned on two sides. Non traditional and expanding activities prefer MERCOSUR over greater integration with the Andean group. It is also likely that greater integration would lead to a reduction in smuggling overall, and less between Bolivia and Mercosur. MFN trade would have neither strong opposition nor support. But it would avoid the political economy consideration that the future of trade

Appendix

The Computation of the Trade Compatibility Index for a Three-country, Two-goods Case[12]

Consider three countries A, B, C and two goods 1, and 2. The compatibility index of country A's imports with the exports of country B can be defined as

$$S_{mAxB} = 1 - [((|m_{1A} - x_{1B}|) + (|m_{2A} - x_{2B}|))/2]$$

where x_{1B} is the share of good 1 in total exports of country B, m_{1A} is the share of good 1 in total imports of country A, x_{2B} is the share of good 2 in total exports of country B, and m_{2A} is the share of good 2 in total imports of country A. These are in turn defined as follows.

$$x_{1B} = X_{B1}/(X_{B1}+X_{B2}), \qquad x_{2B} = X_{B2}/(X_{B1}+X_{B2})$$

$$m_{1A} = M_{A1}/(M_{A1}+M_2), \qquad m_{2A} = M_2/(M_{A1}+M_2)$$

where X_{B1} is country B's exports of good 1, X_{B2} is country B's exports of good 2, M_{A1} is country A's imports of good 1, and M_2 is country A's imports of good 2.

A similar compatibility index of country A's exports with the imports of country B can be defined as

$$S_{xAmB} = 1 - [((|x_{1A} - m_{1B}|) + (|x_{2A} - m_{2B}|))/2]$$

where m_{1B} is the share of good 1 in total imports of country B, x_{1A} is the share of good 1 in total exports of country A, m2B is the share of good 2 in total imports of country B, and x_{2A} is the share of good 2 in total exports of country A. These are in turn defined as follows.

$$m_{1B} = M_{B1}/(M_{B1}+M_{B2}), \qquad m_{2B} = M_{B2}/(M_{B1}+M_{B2})$$

Based on similar considerations, the compatibility index of country A's imports with the exports of country C can be defined as

$$S_{mAxC} = 1 - [((|m_{1A} - x_{1C}|) + (|m_{2A} - x_{2C}|))/2]$$

where x_{1C} is the share of good 1 in total exports of country C, m_{1A} is the share of good 1 in total imports of country A, x_{2C} is the share of good 2 in total exports of country C, and m_{2A} is the share of good 2 in total imports of country A. These are in turn defined as follows.

$$x_{1C} = X_{C1}/(X_{C1} + X_{C2}), \qquad x_{2C} = X_{C2}/(X_{C1} + X_{C2})$$

$$m_{1A} = M_{A1}/(M_{A1} + M_2), \qquad m_{2A} = M_2/(M_{A1} + M_2)$$

where X_{C1} is country C's exports of good 1, X_{C2} is country C's exports of good 2, M_{A1} is country A's imports of good 1, and M_2 is country A's imports of good 2.

A similar compatibility index of country A's exports with the imports of country C can be defined as

$$S_{xAmC} = 1 - [((|x_{1A} - m_{1C}|) + (|x_{2A} - m_{2C}|))/2]$$

where m_{1C} is the share of good 1 in total imports of country C, x_{1A} is the share of good 1 in total exports of country A, m_{2C} is the share of good 2 in total imports of country C, and x_{2A} is the share of good 2 in total exports of country A. These are in turn defined as follows.

$$m_{1C} = M_{C1}/(M_{C1}+M_{C2}), \qquad m_{2C} = M_{C2}/(M_{C1}+M_{C2})$$

$$x_{1A} = X_{A1}/(X_{A1} + X_2), \qquad x_{2A} = X_2/(X_{A1} + X_2)$$

where M_{C1} is country C's imports of good 1, M_{C2} is country C's imports of good 2, X_{A1} is country A's exports of good 1, and X_2 is country A's exports of good 2.

References

Alam, Asad and Sarath Rajapatirana [1993], "Trade Policy Reform in Latin America and the Caribbean in the 1980s," *World Bank Policy Research Working Paper No. 2993*.

Bhagwati, Jagdish [1974], *Illegal Transactions in International Trade*, North-Holland, Amsterdam.

GATT [1993], *Bolivia Trade Policy Review Mechanism*, Geneva.

International Monetary Fund, *International Financial Statistics*, Various Years.

Lucas, Robert E., Jr. [1976], "Econometric Policy Evaluation: a Critique," in: K. Brunner and A. Meltzer (ed.), *The Phillips Curve and Labor Markets*, Carnegie-Rochester Conference Series on Public Policy, Vol. 1, Amsterdam: North-Holland.

Michaely, Michael [1994], "Preferential Trade Agreements in Latin America: An Ex Ante Assessment," Mimeo. World Bank.

Mills, Terence [1990], *Time-Series Techniques for Economists*, Cambridge University Press, Cambridge, New York

Rajapatirana, Sarath [1994], "The Evolution of Trade Treaties and Trade Creation: Lessons for Latin America," *World Bank Policy Research Paper* No. 1371.

The World Bank [1995], "Global Economic Prospects," Mimeo.

Whalley, John T. and T.N. Srinivasan [1986], *General Equilibrium Trade Policy Modeling*, MIT Press, Cambridge, Mass.