

ANNEX 1

Protection applied on agricultural imports and faced by agricultural exports in 2004²⁰

Protection Applied (in percent)

Importers	APPLIED	TRQ_MARG	PREF_MARG	AD VAL comp.
World	18.9	3.1	2.7	10.8
Albania	9.4	0.0	0.0	9.4
Algeria	15.3	0.0	0.0	15.3
Angola	7.3	0.0	0.0	7.3
Antigua and Barbuda	16.2	0.0	0.1	16.2
Argentina	11.4	0.0	1.4	11.4
Armenia	4.9	0.0	0.2	4.9
Australia	1.8	0.0	0.1	1.5
Azerbaijan	10.6	0.0	0.5	8.2
Bahamas	26.5	0.0	0.0	25.8
Bahrain	19.2	0.0	0.1	19.2
Bangladesh	19.3	0.0	0.0	19.3
Barbados	46.9	0.3	0.4	36.7
Belarus	11.2	0.0	1.1	9.7
Belize	24.3	0.0	0.1	14.6
Bermuda	38.5	0.0	0.0	7.1
Bhutan	21.7	0.0	0.0	21.7
Bolivia	9.8	0.0	0.2	9.8
Bosnia and Herzegovina	4.1	0.0	1.2	4.1
Botswana	17.1	0.0	2.7	15.8
Brazil	10.1	0.4	1.2	10.1
Brunei Darussalam	19.6	0.0	0.0	0.0
Bulgaria	19.8	2.0	0.3	16.9
Burkina Faso	11.6	0.0	0.5	11.6
Burundi	25.8	0.0	2.0	25.8
Cambodia	13.0	0.0	0.0	13.0

²⁰APPLIED (resp. FACED in case of the next table) refers to the average ad valorem equivalent of applied (resp. FACED) protection. TRQ_MARG is the ad valorem equivalent preferential margins related to Tariff Rate Quotas. PREF_MARG is the ad valorem equivalent preferential margin related to unilateral or reciprocal preferential schemes. Therefore APPLIED (or FACED)+TRQ_MARG+PREF_MARG gives the *ad valorem* equivalent tariff that would prevail if all trade relations were covered by MFN Tariffs.

AD_VAL is the ad valorem component of applied protection.

Therefore, APPLIED (or FACED) – AD_VAL equals the *ad valorem* equivalent of the specific component of protection.

Non-distorting farm support to enhance global food production

<i>Protection Applied (in percent) (continued)</i>				
Cameroon	21.4	0.0	0.0	21.4
Canada	15.9	1.5	10.7	15.2
Central African Republic	21.4	0.0	0.1	21.4
Chad	20.6	0.0	0.1	20.6
Chile	3.7	0.1	2.7	3.7
China	11.1	14.8	0.0	10.8
Colombia	16.4	0.0	1.2	16.4
Congo	20.6	0.0	0.1	20.6
Congo Democratic Republic	11.9	0.0	0.0	11.9
Costa Rica	16.4	1.2	0.2	16.4
Côte d'Ivoire	11.4	0.0	0.3	11.4
Croatia	16.7	0.6	3.3	7.4
Cuba	9.7	0.0	1.6	9.7
Djibouti	16.6	0.0	0.6	16.6
Dominica	16.1	0.0	0.1	16.1
Dominican Republic	8.5	1.0	0.2	8.5
Ecuador	13.3	0.0	0.8	13.3
Egypt	41.5	0.0	0.3	87.5
El Salvador	10.2	0.0	0.2	10.2
Equatorial Guinea	18.8	0.0	0.0	18.8
Eritrea	6.9	0.0	0.4	6.9
Ethiopia	16.5	0.0	0.1	16.5
European Union	21.3	2.9	2.5	4.1
FYROM	14.8	0.0	4.6	14.8
Gabon	18.8	0.0	0.0	18.8
Georgia	11.4	0.0	0.5	11.4
Ghana	18.9	0.0	0.0	18.9
Grenada	17.2	0.0	0.1	17.2
Guatemala	8.6	0.0	0.1	8.6
Guinea Bissau	11.6	0.0	0.6	11.6
Guyana	18.5	0.0	0.1	18.5
Honduras	10.5	0.0	0.2	10.5
Hong Kong	0.0	0.0	0.0	0.0
Iceland	63.6	16.7	2.7	11.2

Market access versus domestic support: Assessing the relative impacts on developing countries' agriculture

Protection Applied (in percent) (continued)

India	58.4	0.0	0.3	58.2
Indonesia	9.1	0.0	0.2	7.6
Iran	26.5	0.0	0.0	26.5
Israel	33.4	1.5	3.6	15.7
Jamaica	13.9	0.0	0.1	13.9
Japan	28.2	3.4	13.2	9.6
Jordan	14.6	0.0	0.4	14.2
Kazakhstan	8.9	0.0	0.4	8.9
Kenya	29.8	0.0	1.2	29.8
Korea	36.8	17.8	0.2	36.8
Kuwait	15.6	0.0	0.1	15.6
Kyrgyzstan	6.8	0.0	0.3	6.2
Lao People's Dem. Republic	14.7	0.0	0.8	14.7
Lebanon	8.7	0.0	0.2	8.7
Lesotho	15.4	0.0	1.2	13.5
Libyan Arab Jamahiriya	14.4	0.0	0.2	14.4
Madagascar	4.6	0.0	0.4	4.6
Malawi	12.3	0.0	0.9	12.3
Malaysia	26.9	0.0	0.3	3.3
Maldives	17.6	0.0	0.0	17.6
Mali	11.6	0.0	0.6	11.6
Mauritania	8.9	0.0	0.0	8.9
Mauritius	21.6	0.0	0.8	21.6
Mayotte	6.6	0.0	0.0	6.6
Mexico	22.6	0.1	13.0	22.6
Moldova Rep. of	10.8	0.0	0.4	8.5
Morocco	40.8	0.9	2.4	40.8
Mozambique	12.2	0.0	0.1	12.2
Myanmar	6.0	0.0	0.0	6.0
Namibia	15.5	0.0	2.1	14.1
Nepal	14.2	0.0	0.0	11.1
New Zealand	6.3	0.0	0.2	1.8
Nicaragua	12.0	1.0	0.2	12.0
Niger	11.6	0.0	0.5	11.6

Non-distorting farm support to enhance global food production

<i>Protection Applied (in percent) (continued)</i>				
Nigeria	42.6	0.0	0.0	42.6
Norway	74.4	1.4	4.3	5.6
Oman	22.0	0.0	0.1	22.0
Pakistan	22.7	0.0	0.0	14.6
Panama	15.8	1.9	0.0	15.8
Papua New Guinea	19.0	0.0	0.0	12.4
Paraguay	10.2	0.0	1.4	10.2
Peru	12.5	0.0	0.9	12.5
Philippines	9.8	0.5	1.1	9.8
Qatar	6.7	0.0	0.1	6.7
Romania	22.9	0.3	2.5	22.9
Russian Federation	12.1	0.0	1.2	10.7
Rwanda	10.5	0.0	0.3	10.5
Saint Kitts and Nevis	14.0	0.0	0.1	12.4
Saint Lucia	12.5	0.0	0.1	12.5
Saint Vincent	12.2	0.0	0.1	11.8
Saudi Arabia	7.7	0.0	0.1	7.7
Senegal	11.7	0.0	0.4	11.7
Serbia-Montenegro	15.4	0.0	0.0	15.4
Seychelles	42.2	0.0	0.0	42.2
Singapore	1.5	0.0	0.0	0.0
Solomon Islands	48.1	0.0	0.0	35.4
South Africa	15.0	2.9	2.6	14.0
Sri Lanka	19.7	0.0	0.0	17.6
Sudan	24.4	0.0	2.4	24.4
Suriname	19.2	0.0	0.0	19.2
Swaziland	15.5	0.0	2.4	14.1
Switzerland	54.0	29.7	11.5	1.9
Syrian Arab Republic	16.5	0.0	0.0	16.5
Taiwan	23.7	0.7	-0.2	17.2
Tajikistan	9.2	0.0	0.3	6.8
Tanzania	17.5	0.0	0.2	17.5
Thailand	38.8	0.0	0.3	38.3
Togo	11.7	0.0	0.4	11.7

Market access versus domestic support: Assessing the relative impacts on developing countries' agriculture

<i>Protection Applied (in percent) (continued)</i>				
Trinidad and Tobago	16.9	0.0	0.1	16.9
Tunisia	46.3	5.1	2.1	46.3
Turkey	35.3	0.0	1.0	34.7
Turkmenistan	18.2	0.0	0.6	13.4
Uganda	9.8	0.0	0.2	9.8
Ukraine	26.3	0.0	0.3	5.4
United Arab Emirates	9.9	0.0	0.0	9.9
Uruguay	10.9	0.0	1.3	10.9
USA	8.9	1.1	0.6	3.1
Uzbekistan	7.4	0.0	0.2	7.4
Vanuatu	45.6	0.0	0.0	9.0
Venezuela	14.0	0.0	0.9	14.0
Viet Nam	19.8	0.0	3.3	19.8
Yemen	10.2	0.0	0.3	10.2
Zambia	13.3	0.0	1.0	13.3
Zimbabwe	20.5	0.0	0.5	20.0

Source: MAcMap-HS6, version 2. Reference group weighting scheme (see Boumelassa, Laborde, and Mitaritonna, 2009).

Note: Intra-EU trade relations are excluded from the analysis.

<i>Protection Faced (in percent)</i>				
Exporters	FACED	TRQ_MARG	PREF_MARG	AD VAL. Comp
World	18.9	3.1	2.7	10.8
Afghanistan	19.5	0.0	0.1	18.7
Albania	9.1	0.9	2.8	7.4
Algeria	14.0	0.8	1.7	10.2
Andorra	12.3	0.1	8.9	7.4
Angola	14.5	1.1	0.9	13.7
Anguilla	36.4	0.0	0.8	38.7
Antigua and Barbuda	13.2	0.4	4.4	13.3
Argentina	13.4	5.6	1.6	10.1
Armenia	54.6	0.3	5.5	19.2
Aruba	35.4	0.0	18.9	16.1
Australia	23.3	9.2	1.3	10.9
Azerbaijan	16.2	0.3	1.4	12.4
Bahamas	5.9	0.0	-0.7	5.5

Non-distorting farm support to enhance global food production

Protection Faced (in percent) (continued)

Bahrain	18.9	0.7	2.4	13.4
Bangladesh	26.5	0.8	6.3	16.8
Barbados	32.2	6.0	1.5	14.1
Belarus	21.6	0.2	2.8	17.4
Belize	47.0	9.3	9.1	7.0
Benin	9.8	1.0	1.2	9.1
Bermuda	23.9	1.1	0.3	11.6
Bhutan	28.1	0.0	1.3	27.2
Bolivia	10.9	3.8	2.2	8.9
Bosnia and Herzegovina	14.0	0.0	6.3	10.2
Botswana	47.4	7.6	8.0	6.9
Brazil	23.6	4.8	1.0	11.7
Brunei Darussalam	13.1	1.3	0.8	11.8
Bulgaria	18.9	3.4	4.0	10.4
Burkina Faso	11.8	1.1	0.5	9.0
Burundi	13.5	0.0	1.1	12.6
Cambodia	24.1	1.9	12.8	12.3
Cameroon	9.1	0.5	5.0	4.9
Canada	16.2	5.0	2.0	6.4
Cape Verde	6.5	0.0	3.1	5.6
Cayman Islands	20.2	0.2	1.7	14.1
Central African Republic	5.2	1.2	1.7	3.8
Chad	3.2	1.2	0.0	1.6
Chile	12.2	0.8	2.8	8.5
China	19.7	2.1	2.2	10.5
Colombia	18.7	1.1	2.5	8.6
Comoros	1.6	0.0	2.8	1.6
Congo Democratic Republic	14.0	0.3	4.0	10.0
Cook Islands	8.4	0.0	4.7	6.4
Costa Rica	21.8	1.3	2.1	9.8
Côte d'Ivoire	6.6	0.4	2.0	4.8
Croatia	20.2	1.3	9.9	14.5
Cuba	25.7	4.6	5.9	13.1
Djibouti	12.6	0.1	4.0	12.5

Market access versus domestic support: Assessing the relative impacts on developing countries' agriculture

<i>Protection Faced (in percent) (continued)</i>				
Dominica	20.3	0.1	8.4	11.9
Dominican Republic	22.5	3.7	9.4	4.7
East Timor	9.3	0.0	0.2	8.1
Ecuador	27.9	0.6	4.3	8.2
Egypt	15.9	2.7	3.2	11.4
El Salvador	26.9	1.6	1.8	13.8
Equatorial Guinea	2.1	0.0	0.3	1.9
Eritrea	11.2	0.4	7.9	8.6
Ethiopia	11.1	0.0	1.1	8.8
European Union	18.3	2.4	2.9	11.4
Falkland Islands (Malvinas)	4.3	0.0	2.8	3.6
Fiji	77.2	19.5	3.2	5.3
French Polynesia	5.1	0.0	7.9	3.7
Gabon	46.4	0.4	1.1	44.0
Gambia	15.0	1.6	3.7	13.4
Georgia	31.9	5.1	2.3	18.2
Ghana	4.7	0.7	1.0	4.2
Gibraltar	29.8	0.0	3.2	16.2
Greenland	4.2	0.0	4.1	3.2
Grenada	6.8	1.5	0.6	6.4
Guatemala	32.7	1.3	2.2	9.9
Guinea	5.8	0.6	2.0	5.0
Guinea Bissau	23.7	0.1	0.9	23.6
Guyana	107.2	3.1	6.7	9.2
Haiti	1.8	0.1	1.8	1.5
Honduras	16.9	0.9	3.2	8.3
Hong Kong	21.9	0.8	0.1	20.8
Iceland	13.5	3.4	1.2	5.6
India	18.9	3.0	2.2	10.7
Indonesia	20.4	1.1	1.4	17.4
Iran	10.2	0.1	0.6	8.6
Iraq	18.3	0.0	2.4	15.6
Israel	7.6	1.2	3.4	5.6
Jamaica	44.6	8.5	10.1	6.3
Japan	15.2	1.5	0.2	11.0

Non-distorting farm support to enhance global food production

Protection Faced (in percent) (continued)				
Jordan	13.8	3.4	3.8	10.3
Kazakhstan	24.8	0.4	1.6	20.2
Kiribati	18.7	0.0	1.6	17.1
Korea	16.5	0.6	0.5	11.5
Korea Dem. People's Rep.	15.4	0.0	-2.3	14.1
Kuwait	18.4	0.8	2.1	12.2
Kyrgyzstan	19.4	0.8	0.9	12.6
Lao People's Dem. Republic	9.6	0.0	1.8	8.6
Lebanon	15.9	0.2	3.3	13.0
Lesotho	9.0	0.6	8.8	7.4
Liberia	9.6	0.0	0.8	9.4
Libyan Arab Jamahiriya	8.4	0.0	0.6	7.0
Macau	22.2	0.1	0.6	20.0
Madagascar	4.9	0.6	3.0	2.4
Malawi	24.3	1.6	6.2	14.3
Malaysia	20.1	2.4	1.2	16.9
Maldives	21.5	8.2	0.5	18.6
Mali	6.9	0.9	0.5	6.0
Marshall Islands	6.9	2.4	3.0	3.5
Mauritania	18.3	0.1	2.1	12.8
Mauritius	53.0	0.3	1.8	5.8
Mexico	9.5	2.3	2.5	5.8
Micronesia Federated St.	19.6	0.7	0.6	18.7
Moldova Rep. of	46.6	1.6	3.2	13.9
Mongolia	8.6	0.4	0.1	8.2
Morocco	10.3	1.9	2.4	6.8
Mozambique	22.6	3.2	1.8	15.1
Myanmar	23.2	1.8	1.9	19.1
Namibia	38.8	2.9	2.6	18.3
Nauru	17.6	0.8	0.6	13.0
Nepal	26.3	1.0	7.8	18.4
Netherland Antilles	39.2	1.1	3.5	14.3
New Caledonia	27.7	0.0	0.4	27.0
New Zealand	27.1	5.8	1.9	11.6

Market access versus domestic support: Assessing the relative impacts on developing countries' agriculture

<i>Protection Faced (in percent) (continued)</i>				
Nicaragua	37.0	2.2	1.8	14.8
Niger	18.0	0.1	3.6	17.6
Nigeria	4.6	0.1	0.5	3.8
Northern Mariana Islands	14.6	0.0	0.0	13.5
Norway	13.2	4.2	2.0	6.3
Oman	23.5	0.9	2.0	19.6
Pakistan	39.4	2.0	9.9	12.6
Palau	13.0	0.9	1.9	8.8
Palestinian territory	16.5	1.7	0.9	12.2
Panama	40.3	1.3	3.6	11.3
Paraguay	12.0	4.0	1.6	7.5
Peru	9.1	0.8	5.3	5.1
Philippines	24.5	1.1	1.8	9.7
Qatar	21.6	0.7	1.2	16.6
Romania	15.3	3.0	2.7	9.0
Russian Federation	25.6	0.1	1.7	19.9
Rwanda	18.0	0.0	2.1	18.0
Saint Kitts and Nevis	53.6	0.1	1.3	6.0
Saint Lucia	34.0	0.4	14.8	8.4
Saint Vincent	22.8	4.6	11.3	9.4
Samoa	6.8	0.1	6.6	3.7
Sao Tome and Principe	3.9	0.0	1.2	3.2
Saudi Arabia	38.1	0.9	5.3	10.3
Senegal	14.3	0.8	2.4	13.0
Serbia-Montenegro	41.3	0.3	11.8	11.8
Seychelles	30.8	0.7	1.0	28.2
Sierra Leone	5.7	0.4	2.5	4.4
Singapore	22.6	0.8	1.7	19.7
Solomon Islands	6.9	0.0	1.1	6.3
Somalia	11.4	0.0	8.1	9.5
South Africa	17.2	1.1	1.8	13.1
Sri Lanka	16.5	0.7	1.3	14.5
St. Pierre and Miquelon	21.1	0.0	-0.1	18.6
Sudan	10.7	0.0	1.5	7.2

Non-distorting farm support to enhance global food production

Protection Faced (in percent) (continued)

Suriname	35.5	2.8	14.4	9.0
Swaziland	30.8	4.6	1.9	13.0
Switzerland	17.8	1.1	2.6	11.4
Syrian Arab Republic	14.5	0.1	1.1	10.9
Taiwan	13.3	1.3	0.4	9.2
Tajikistan	6.6	1.9	0.5	5.9
Tanzania	19.3	0.6	2.4	13.1
Thailand	34.9	5.7	3.8	14.6
Togo	12.4	1.2	1.6	11.4
Tonga	10.4	0.7	3.6	6.5
Trinidad and Tobago	23.0	2.2	1.9	16.2
Tunisia	22.0	0.8	1.6	7.6
Turkey	12.1	0.8	3.2	8.5
Turkmenistan	5.1	1.5	0.0	3.9
Turks and Caicos Islands	21.3	0.4	18.7	6.6
Uganda	10.4	0.2	3.5	8.7
Ukraine	24.0	0.5	3.2	14.5
United Arab Emirates	19.4	2.0	2.7	14.0
Uruguay	34.8	5.4	2.5	14.4
USA	15.4	4.1	4.2	8.4
Uzbekistan	8.8	1.0	0.3	7.2
Vanuatu	6.2	0.2	9.8	3.7
Venezuela	17.4	2.0	1.8	12.7
Viet Nam	18.4	0.7	0.9	14.9
Virgin Islands (British)	13.2	0.0	0.8	11.9
Wallis and Futuna Island	9.1	0.0	0.3	9.0
Yemen	16.4	0.0	4.7	12.6
Zambia	16.4	0.4	3.9	10.5
Zimbabwe	21.7	1.2	4.0	13.9

Source: MAcMap-HS6, version 2. Reference group weighting scheme (see Boumelassa, Laborde, and Mitaritonna, 2009).
 Note: Intra-EU trade relations are excluded from the analysis.

ANNEX 2

Regional and sectoral aggregations in MIRAGE

Regional Aggregation

Region	GTAP7 code
African LDCs	sen, mdg, mwi, moz, tza, uga, zmb
Argentina	Arg
Australia and New Zealand	nzl, aus
Bangladesh	Bgd
Brazil	Bra
Cambodia	Khm
Canada	Can
China	Chn
EFTA	che, nor,xef, xer, xna
EU 27	rou, bgr, gbr, swe, esp, svn, svk, prt, pol, nld, mlt, lux, ltu, lva, ita, irl, hun, grc, deu, fra, fin, est, dnk, cze, cyp, bel, aut
Hong Kong - Singapore	hkg, sgp
India	Ind
Japan	Jpn
Korea and Taiwan	kor, twn
Mexico	Mex
Middle East and North Africa	irn, xws, egypt, mar, tun, xnf
Nigeria	Nga
Other transition economies	alb, blr, hrv, ukr, xee, kaz, kgz, xsu, arm, aze, geo
Pakistan	Pak
Rest of East Asia	xea, idn, lao, mmr, mys, xoc, phl, vnm, xse
Rest of Eastern Africa	Xec
Rest of LAC	bol, chl, col, ecu, pry, per, ury, ven, xsm, cri, gtm, nic, pan, xca, xcb
Rest of South Africa	xac, mus, zwe, bwa, xsc
Rest of South Asia	Xsa
Rest of South East Asia	xoc, xea, idn, lao, mmr, mys, phl, vnm, xse
Rest of Sub Saharan Africa	xwf, xcf, eth, xec
Rest Of the World	xoc, xna, alb, blr, hrv, rus, ukr, xef, kaz, kgz, xsu, arm, aze, geo
Russia	Rus
South Africa	Zaf
Sri Lanka	Lka
Thailand	Tha
Turkey	Tur
United States	usa,

Non-distorting farm support to enhance global food production

Sectoral Aggregation

Sectors	GTAP7 code
Other crops	Ocr
Rice	pdr, pcr
Cereals	Gro
Food products	ofd, fsh, b_t
Dairy products	Mil
Cattle and other animal products	ctl, oap, rmk, wol
Oil seeds	Osd
Meat products	cmt, omt
Plant-based fibers	Pfb
Sugar	c_b, sgr
Vegetables and fruit	v_f
Wheat	Wht
Vegetable oils and fats	Vol
Chemical products	Crp
Electronic, machinery and transport equipment	ele, otr, ome
Forestry and minerals	frs, omn
Leather	Lea
Construction	Cns
Other manufactured products	nmm, fmp, lum, ppp, i_s, nfm, omf
Motor vehicles	Mvh
Other primary products	coa, oil,gas, p_c
Textiles	tex
Wearing apparels	wap
Other services	ely, gdt, wtr, trd, cmn, ofi, isr, obs, ros, osg, dwe
Transport and trade	otp, wtp, atp

Policies affecting agricultural incentives in developing countries

Kym Anderson¹

Introduction

For many decades the earnings of farmers and associated rural businesses in developing countries have been depressed by agricultural protection and subsidies in today's high-income countries (Johnson 1991; Tyers and Anderson 1992). Those policies almost certainly added to inequality and poverty, since three-quarters of the world's poorest people depend directly or indirectly on agriculture for their main income (World Bank 2007)². But in addition to this external policy influence on rural poverty, the governments of many developing countries have directly taxed their farmers over most of the past half-century. As well, many developing countries in the 1960s and 1970s chose to also pursue an import-substituting industrialization strategy, predominantly by restricting imports of manufactures, which indirectly taxed other tradable sectors in those developing economies, including agriculture (Krueger, Schiff and Valdés 1988, 1991). Thus the price incentives facing farmers in many developing countries have been depressed by both own-country and other countries' farm, food and trade policies.

During the past quarter-century, however, there have been substantial policy reforms in numerous developing countries, and even a few reductions in farm protection rates in some high-income countries. This chapter surveys the extent to which government policies at home and abroad are still distorting prices faced by

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² According to FAOSTAT data, there are less than 15 million relatively wealthy farmers in developed countries, with an average of almost 80 hectares per worker. They are being helped at the expense of not only consumers, taxpayers and producers of other tradables in those rich countries but also the majority of the 1.3 billion relatively impoverished farmers and their large families in developing countries who, on average, have to earn a living from just 2.5 hectares per worker.

developing country farmers this decade as compared with the previous four decades. It shows that, notwithstanding recent reforms, many price distortions remain in the agricultural sector of both developing and high-income countries. Estimates from a global economy wide model show how much could be gained by removing the interventions still remaining as of 2004, indicating what is at stake in the WTO's Doha Development Agenda. Those results also indicate how much that could reduce poverty in various developing country regions. The chapter concludes by pointing to the prospects for further policy reform in global agricultural markets.

7.1 How much have global agricultural distortions changed since the 1950s?

A recent World Bank study has estimated, for a sample of 75 countries (accounting for 90 percent of global agriculture) over the period from 1955 to 2007, the extent to which government-imposed distortions have created a gap between domestic prices of farm products and what they would be under free markets each year (Anderson 2009)³. Specifically, the study computed a Nominal Rate of Assistance (NRA) for each farm product, defined as the percentage by which government policies have raised gross returns to farmers above what they would be without the government's intervention (or lowered them, if the NRA is negative). A weighted average NRA for all covered products is derived using the value of production at undistorted prices as weights. To that NRA for covered products is added a 'guesstimate' of the NRA for non-covered products and an estimate of the NRA from non-product-specific forms of assistance or taxation. Since the 1980s some high-income governments have also provided assistance to farmers that is somewhat 'decoupled' from production and so in principle is less distortionary of resource allocation. Its NRA has been computed separately though, and is not included for direct comparison with the NRAs for other sectors or for developing countries. Each farm industry is classified either as import-competing, or a producer of exportables, or as producing a nontradable (with its status sometimes changing over the years), so as to generate for each year the weighted average NRAs for the two different groups of covered tradable farm products.

Also generated by that World Bank study is a production-weighted average NRA for nonagricultural tradables, for comparison with that for agricultural tradables via the calculation of a percentage Relative Rate of Assistance (RRA), defined as:

$$RRA = 100 * [(100 + NRA_{ag}^t) / (100 + NRA_{nonag}^t) - 1]$$

where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of

³ The methodology used in that study is summarized in Anderson et al. (2008), and the full panel dataset of estimates is freely available on-line (Anderson and Valenzuela 2008). The detailed developing country case studies are reported in four regional volumes covering Africa (Anderson and Masters 2009), Asia (Anderson and Martin 2009), Latin American (Anderson and Valdés 2008) and Europe's transition economies (Anderson and Swinnen 2008).

the agricultural (including non-covered) and non-agricultural sectors, respectively⁴. Since the NRA cannot be less than -100 percent if producers are to earn anything, neither can the RRA (since the weighted average NRA_{nonag}^t is non-negative in all our country case studies). And if both of those sectors are equally assisted, the RRA is zero. This measure is useful in that if it is below (above) zero, it provides an internationally comparable indication of the extent to which a country's sectoral policy regime has an anti- (pro-)agricultural bias.

In addition to the mean NRA, a measure of the dispersion or variability of the NRA estimates across the covered farm products also is generated for each economy. The cost of government policy distortions to incentives in terms of resource misallocation tend to be greater the greater the degree of substitution in production. In the case of agriculture which involves the use of farm land that is sector-specific but transferable among farm activities, the greater the variation of NRAs across industries within the sector then the higher will be the welfare cost of those market interventions. High NRAs matter also because the welfare cost of a price distortion is proportional to the square of the rate of assistance. A simple indicator of dispersion is the standard deviation of the covered industries' NRAs.

For the purposes of the present study, the world economy is divided into high-income countries (Western Europe, the United States/Canada, Japan, and Australia/New Zealand) and several developing country regions (most notably Africa, East plus South Asia, Latin America, and the transition economies of Eastern Europe and Central Asia plus Turkey). North America and Europe each account for almost one-third of the global economy but, when the focus turns to just agriculture, developing countries are responsible for slightly over half the value added globally, with Asia accounting for two-thirds of that lion's share. The developing countries' majority becomes stronger still in terms of global population and even more so in terms of farmers, almost three-quarters of whom are in Asian developing countries. Hence there is a vast range of national per capita incomes and endowments of agricultural land per capita, and thus agricultural comparative advantages, across those country groups, and a strong concentration of poor people in Asia (Sandri, Valenzuela and Anderson 2007).

The NRA estimates reveal that aggregate support for farmers in high-income countries rose steadily throughout the period from the 1950s to the late 1980s before declining slightly over the 15 years to 2004. On the other hand, the price and trade policies of developing countries heavily taxed their farmers in aggregate from the early 1960s to the late 1970s/early 1980s before gradually reducing that

⁴ Farmers are affected not just by prices of their own products but also by the incentives nonagricultural producers face. That is, it is relative prices and hence relative rates of government assistance that affect producer incentives. More than seventy years ago Lerner (1936) provided his Symmetry Theorem that proved that in a two-sector economy, an import tax has the same effect as an export tax. This carries over to a model that also includes a third sector producing only nontradables (see Vousden 1990, pp. 46-47).

TABLE 7.1
Nominal rates of assistance to agriculture^a in 75 focus countries, by region, 1955 to 2007^c

	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-07
	(percent)										
Africa	-14	-8	-11	-15	-13	-8	-1	-9	-6	-7	na
Asia	-27	-27	-25	-25	-24	-21	-9	-2	8	12	na
Latin America	-11	-8	-7	-21	-18	-13	-11	4	6	5	na
Eastern Europe and Central Asia ^b	na	na	na	na	na	na	na	10	18	18	25
Western Europe	44	57	68	46	56	74	82	64	44	37	18
United States and Canada	13	11	11	7	7	13	19	16	11	17	11
Australia and New Zealand	6	7	10	8	8	11	9	4	3	1	2
Japan	39	46	50	47	67	72	119	116	120	120	81
Developing countries	-26	-23	-22	-24	-22	-18	-8	-2	6	9	na
High-income countries	22	29	35	25	32	41	53	46	35	32	17
All focus countries (weighted average)	3	5	6	0	2	5	17	18	17	18	na

Source: Anderson and Valenzuela (2008), based on estimates reported in the national country studies summarized in Anderson (2009).

a. Weighted average for each country, including non-product specific assistance as well as authors' guesses for non-covered farm products (but not decoupled assistance), with weights based on gross value of agricultural production at undistorted prices. Estimates for China pre-1981 and India pre-1965 are based on the assumption that the nominal rate of assistance to agriculture in those years was the same as the average NRA estimates for those countries for 1981-84 and 1965-69, respectively, and that the gross value of production in those missing years is that which gives the same average share of value of production in total world production in 1981-84 and 1965-69, respectively. Developing country and world aggregates are computed accordingly.

b. Eastern European and Central Asian countries are not included in the high-income or developing country aggregates of this table.

taxation and, by the mid-1990s, switching to slightly positive assistance to them in aggregate (Table 7.1). Thus the contributions of the two groups to the global trend are additive in the 1980s but then offsetting from 1990 to 2004⁵.

Figure 7.1 provides NRA estimates for two sub-groups of covered farm products, namely exportables and import-competing goods. Two striking points about that figure are worth noting. One is the marked difference in the levels of support to import-competing versus exportable farm products. Exportables in high-income countries have received relatively little support other than during the export subsidy 'war' of the mid-1980s, while in developing countries they were increasingly taxed from the late 1950s until the 1980s and then that taxation was gradually phased out over the past two decades (although a little remained in 2004, for example in Argentina, and considerably more was added temporarily by various developing countries in 2008 in response to concerns about the spike in international food prices). Importables, by contrast, have been assisted throughout the past five decades. The second point to note is that the long-run fitted trend line for the import-competing sub-sector has almost the same slope for both sets of countries (albeit with a lower intercept for developing countries). Two lessons can be drawn from this: first, there has been a strong anti-trade bias for agricultural goods in high-income and developing countries that got worse in the 1980s but has diminished somewhat since then; and second, growth in agricultural import protection appears to have accompanied economic growth in developing countries just as it has in high-income countries. True, the NRA for the agricultural sector has reversed slightly since the 1980s for Western Europe (Table 7.1), but less so when the decoupled payments are included (Figure 7.2)⁶.

⁵ In the 2005-07 period when food prices in international markets rose steeply (and spiked even more in 2008), transfers to farmers in high-income countries fell back considerably (as happened also in 1973-74). There are not enough estimates to show the change for developing countries, but their governments too have responded by reducing/suspending import tariffs and temporarily restricting export of food in 2007-08, so they may have added to, rather than offset, the high-income country downward trend in those most recent years.

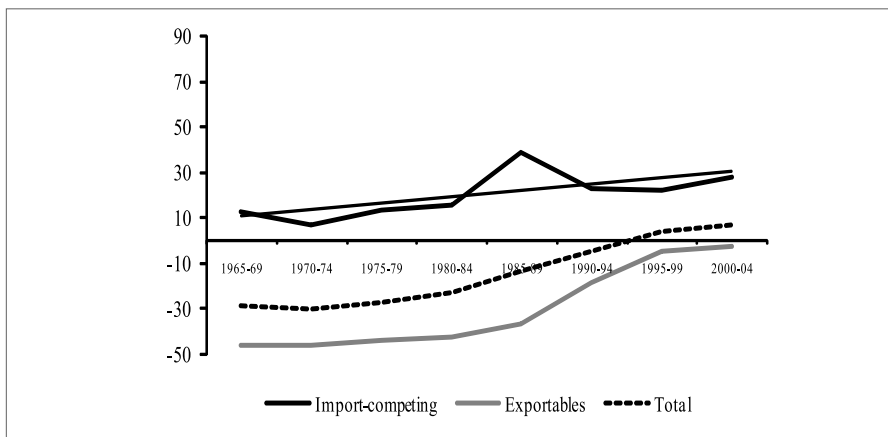
⁶ NRA estimates for most developing countries go only to 2004, but those for OECD countries are available to 2007. Table 1 reveals that the NRAs tend to be lower in 2005-07 because international prices were rising over that period for food and other primary commodities (they peaked in mid-2008), and not all of those rises were being transmitted to domestic markets. In the case of the European Union, an additional force was at work: reform efforts by the EU's Agricultural Commissioner from 1996 to 2004, Franz Fischler, took a major step forward in 2003 (the so-called Mid-term Review of the EU's Agenda 2000 reform program). At that time it was announced that price supports for key farm products were to be cut severely, and replaced by a Single Farm Payment by way of partial compensation. Unlike with the MacSharry reforms of the CAP in 1992, pressure from WTO members was acknowledged within the EU as a contributing force for reform. Just how important that external influence was in contributing to the reform outcome is impossible to say, but see Swinnen (2008) and Josling (2009) for further details.

FIGURE 7.1

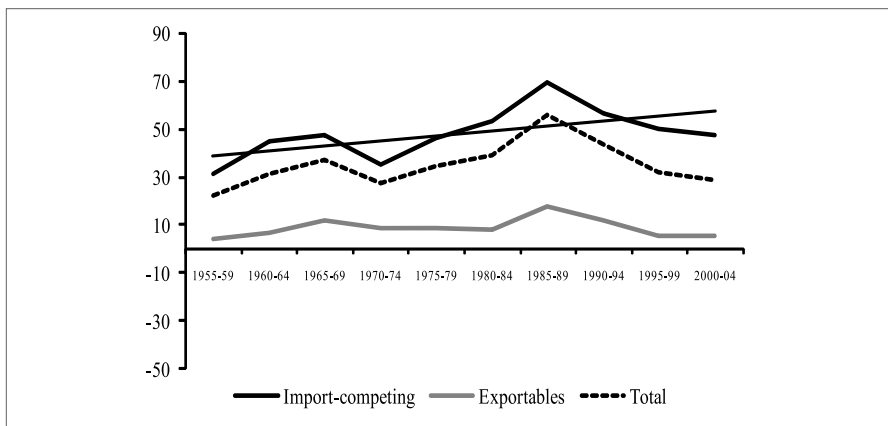
Nominal rates of assistance to exportable, import-competing and all^a covered agricultural products, high-income and developing countries, 1955 to 2004

(percent)

(a) Developing countries (excluding Europe's transition economies)



(b) High-income countries plus Europe's transition economies



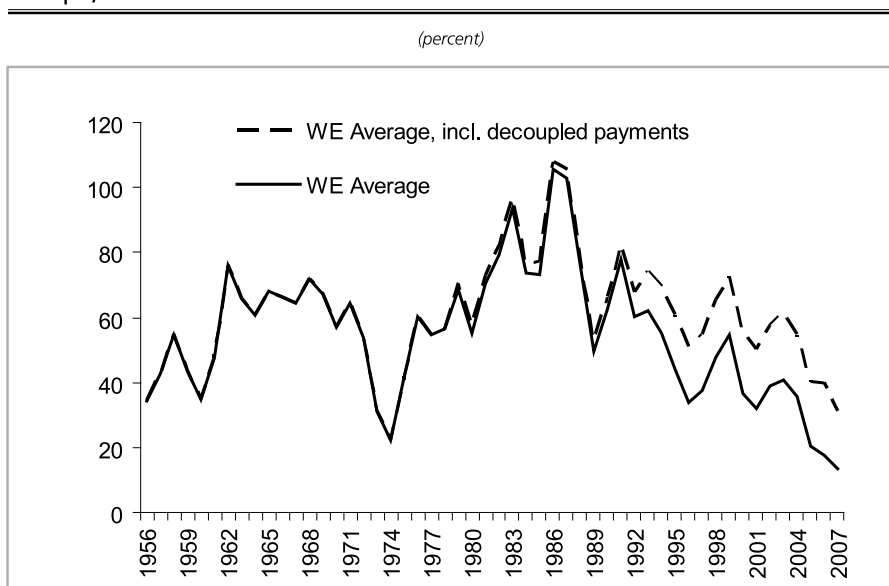
Source: Anderson and Valenzuela (2008), based on estimates reported in the national country studies summarized in Anderson (2009)

a The total also includes nontradable farm products.

That anti-trade bias means that the rates of assistance are not uniform across farm commodities, which indicates that the resources that are employed within the farm sector are not being put to their best use. The extent of that extra inefficiency, over and above that due to too many or too few resources in aggregate in the sector, is crudely indicated by the standard deviation of NRAs among covered products in each focus country⁷. This dispersion index, summarized for the 8 regions in Table 7.2, has fluctuated across time and varied between regions, but the global average has remained around 70 percent throughout the period, with no discernable trend.

FIGURE 7.2

NRA to agriculture without and with decoupled payments, Western Europe, 1956 to 2007



Source: Anderson and Valenzuela (2008) as reported in Josling (2009).

Nor is the NRA dispersion randomly distributed across products. On the contrary, Figure 7.3 shows that rice, sugar and milk (the rice pudding ingredients) are by far the most assisted farm industries in both sets of countries, with beef and poultry meat next. Cotton has the next highest NRA in the high-income figure. This suggests tariff or subsidy peaks prevail within the agricultural sector, which means the welfare cost of these distortions is even higher than it would be if NRAs were equal for each farm industry within the sector.

⁷ More-precise national, regional and global partial equilibrium indicators of the trade- and welfare-reducing effects of this dispersed set of NRAs (and associated distortions to consumer process of farm products) are provided in Lloyd, Croser and Anderson (2009).

TABLE 7.2

Dispersion of nominal rates of assistance across covered agricultural products,^a focus regions, 1965 to 2007

	<i>(percent)</i>								
	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-07
Africa	31	30	37	36	36	31	25	25	Na
Asia	56	42	49	53	66	56	57	64	Na
Latin America	49	44	52	52	44	42	32	40	Na
Eastern Europe and Central Asia	34	33	41	26	39	56	39	45	44
Western Europe	119	85	112	98	122	86	69	74	64
United States and Canada	29	15	31	62	71	39	31	37	28
Australia and New Zealand	40	45	26	17	20	14	12	7	5
Japan	69	82	156	143	175	162	136	143	116
All focus countries (weighted average)	54	45	55	51	59	53	43	48	Na
Product coverage ^b	68	70	71	73	73	72	71	68	70

Source: Anderson and Valenzuela (2008), based on estimates reported in the national country studies summarized in Anderson (2009).

a. Dispersion for each region is a simple average of the country-level annual standard deviations around a weighted mean of NRAs per country across covered products each year.

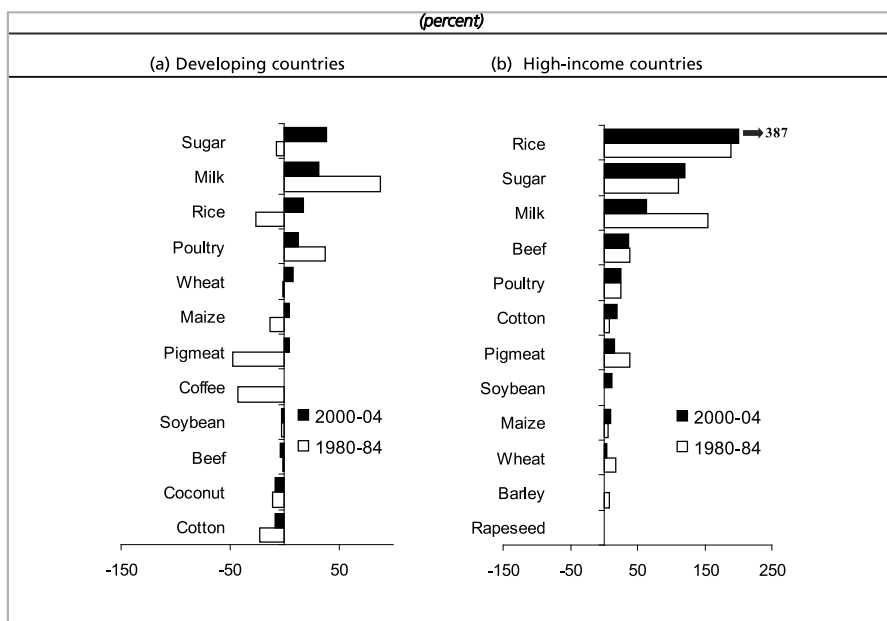
b. Share of gross value of total agricultural production at undistorted prices accounted for by covered products.

The global gross subsidy equivalent of those rates of assistance have risen very substantially in constant (2000) US dollar terms, from close to zero up to the mid-1970s to more than \$200 billion per year at the farm-gate since the mid-1990s (Figure 7.4). When expressed on a per farmer basis, the gross subsidy equivalent (GSE) varies enormously as between high-income and developing countries. In 1980-84 the GSE in high-income countries was already around \$8,000 and by 2000-04 it had risen to \$10,000 on average (and \$25,000 in Norway, Switzerland and Japan), or \$13,500 when 'decoupled' payments are included. By contrast, the GSE in developing economies was -\$140 per farmer in the first half of the 1980s, which is a non-trivial tax when one recalls that at that time the majority of these people's households were surviving on less than \$1 a day per capita. By 2000-04 they received on average around \$50 per farmer (Anderson 2009, Ch. 1). While this represents a major improvement, it is less than one percent of the support received by the average farmer in high-income countries.

Table 7.3 shows the various contributions of different policy measures to the overall estimated NRAs as of 1981-84 and 2000-04. In both periods, trade measures accounted for around three-fifths of the total NRA for both developing

FIGURE 7.3

Nominal rates of assistance, key covered products, high-income and developing countries, 1980-84 and 2000-04



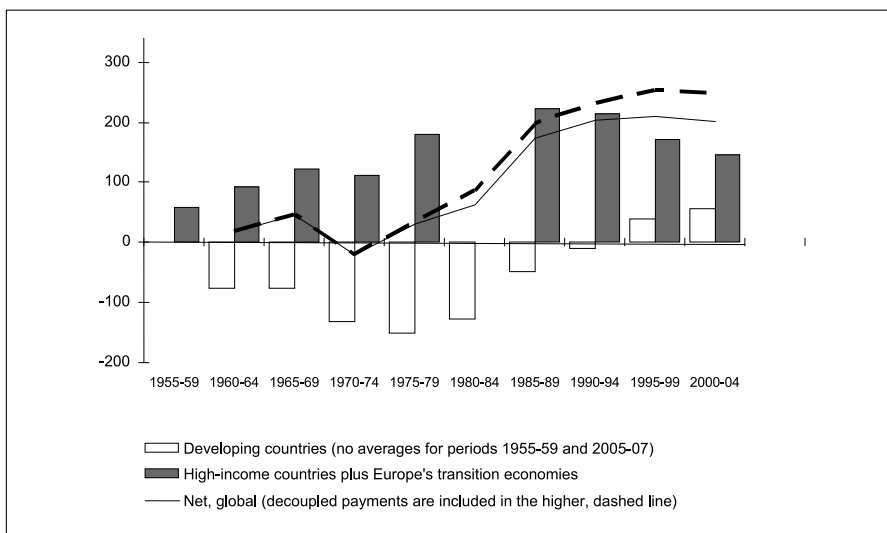
Source: Anderson and Valenzuela (2008), based on estimates reported in the national country studies summarized in Anderson (2009).

and high-income countries⁸. Even when the relatively new decoupled payments to farm households are counted, it is still the case that trade measures at the border (export and import taxes or subsidies and their equivalent from quantitative trade restrictions and multiple exchange rates) are the dominant form of intervention. Leaving those decoupled measures aside, these estimates suggest import barriers are responsible for all but one-quarter of the NRA of high-income countries and all but one-ninth of the NRA of developing countries on average in 2000-04.

⁸ If one assumes that the price elasticities of supply and demand for farm products are equal, and that there are no costs of collecting taxes and dispersing them as subsidies, then the trade-reducing effects of trade measures would be twice as high as for an equally high NRA provided by production subsidies – and an even bigger multiple of the effects of so-called decoupled payments, depending on the extent to which the latter are in practice truly decoupled from production decisions. Furthermore, since the welfare-reducing effects of trade measures are in proportion to the square of the trade tax-cum-subsidy, the border measures would be responsible for much more than three-fifths of the global welfare cost of distortions to agricultural prices, and possibly not much below the more-limited but widely quoted estimate for 2001 of 93 percent by Anderson, Martin and Valenzuela (2006).

FIGURE 7.4

Gross subsidy equivalent of NRAs in high-income and European transition economies and in developing countries, 1960 to 2004 (constant 2000 US\$ billion)



Source: Anderson (2009)

The anti-agricultural policy biases of the past are due to not just agricultural policies. Also important in developing countries, according to Krueger, Schiff and Valdés (1988, 1991), was border protection to the manufacturing sector (the dominant intervention in the tradables part of non-agricultural sectors). Contributors to the Anderson (2009) study typically had to rely on applied trade taxes (for exports as well as imports) rather than undertake price comparisons for non-farm tradables, and hence they usually do not capture the quantitative restrictions on trade which were important in earlier decades but decreasingly so through recent times. Nor does that study capture distortions in the services sectors, some of which now produce tradables (or would do in the absence of interventions preventing their emergence). As a result, the estimated NRAs for non-farm importables are smaller and and probably decline less rapidly than in fact was the case – and likewise for non-farm exportables, except their NRAs in some cases would have been negative. Of those two elements of under-estimation, the former bias almost certainly dominates, so the estimates in Anderson (2009) of the overall NRA for non-agricultural tradables should be considered as lower-bound estimates, and more so in the past so that its decline is less rapid than it should be.

TABLE 7.3

Contributions to total agricultural NRA from different policy instruments,^a by region, 1981-84 and 2000-04

	(percent)			
	1981-84		2000-04	
	All developing countries	High-income countries	All developing countries	High-income countries
Border measures				
Import tax equivalent	6	34	8	24
Export subsidies	1	2	1	1
Export tax equivalent	-20	0	-3	0
Import subsidy equivalent	-2	0	-1	0
ALL BORDER MEASURES	-15	36	5	25
Domestic measures				
Production subsidies	1	2	1	1
Production taxes	-5	0	-1	0
Net subsidies to farm inputs	1	3	2	2
Non-product-specific assistance (except to inputs)	1	1	2	5
ALL DOMESTIC PRODUCTION SUPPORTS	-2	6	4	8
Decoupled payments to farm households	0	6	0	11
NRA including decoupled payments	-17	48	9	44
Gross subsidy equivalent, in real 2000 US\$ billion	-113	223	58	173

Source: Author's derivation, using distortion data in Anderson and Valenzuela (2008).

a. In the absence of data, the share of input tax/subsidy, domestic production tax/subsidy and border tax/subsidies for non-covered farm products are assumed to be the same as that for covered farm products. The first period begins in 1981 because that was the first year for which estimates for China are available.

b. All table entries have been generated by dividing the Gross Subsidy Equivalent of all (including decoupled) measures by the total agricultural sector's gross production valued at undistorted prices.

Despite these methodological limitations, the estimated NRAs for non-farm tradables are very sizeable prior to the 1990s. For developing countries as a whole, the average non-farm NRA has declined steadily throughout the past four or five decades, from around 45 percent in the 1960s to around 30 percent in the 1970s, 16 percent in the 1980s and less than 10 percent since the mid-1990s as policy reforms spread (see near bottom of Table 7.4). This has therefore contributed to a decline in the estimated negative relative rate of assistance for farmers: the weighted average RRA was worse than -50 percent up to the mid-1970s but improved to an average of -38 percent in the 1980s, -12 percent in the 1990s and just above zero (1 percent) in 2000-04. The trend in RRAs and their two component NRAs for developing countries is starkly illustrated in Figure 7.5, where the falling positive NRAs for non-farm producers can be seen to have contributed even more to the rise of the RRA than has the gradual disappearance of the negative NRAs

TABLE 7.4

Nominal rates of assistance to agricultural and nonagricultural tradables, and the RRA,^a by region, 1955 to 2007

	(percent)										
	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-07
Africa											
NRA agric.	na	-13.3	-19.6	-25.0	-22.1	-13.5	-0.3	-15.4	-8.7	-12.0	na
NRA non-agric.	Na	3.7	2.7	1.5	5.7	1.6	9.2	2.7	2.0	7.3	na
RRA	Na	-15.2	-21.4	-26.0	-25.9	-13.1	-8.3	-17.1	-10.4	-18.0	na
Latin America											
NRA agric.	na	-11.4	-9.3	-23.0	-19.0	-12.9	-11.2	4.4	5.5	4.9	na
NRA non-agric.	na	26.9	31.3	27.8	23.3	18.5	16.8	7.3	6.6	5.4	na
RRA	na	-30.2	-30.9	-39.8	-34.2	-26.6	-24.0	-2.7	-1.0	-0.5	na
South Asia ^b											
NRA agric.	na	4.1	4.4	9.7	-7.7	1.8	47.1	0.2	-2.4	12.7	na
NRA non-agric.	na	114.4	117.8	81.7	57.8	54.6	39.9	18.6	15.0	10.1	na
RRA	na	-51.5	-51.9	-39.8	-41.6	-33.3	5.1	-15.5	-14.9	3.4	na
China and Southeast Asia ^b											
NRA agric.	na	-43.6	-42.6	-40.1	-35.7	-34.5	-27.8	-12.0	4.9	7.1	na
NRA non-agric.	na	36.5	36.5	33.7	30.8	20.6	23.3	19.8	9.6	5.5	na
RRA	na	-58.7	-58.0	-55.2	-50.8	-43.4	-41.6	-26.4	-4.2	1.5	na
Japan, Korea and Taiwan											
NRA agric.	30.1	39.9	48.8	51.3	75.5	78.8	124.3	129.9	130.5	138.1	126.1
NRA non-agric.	8.6	8.3	6.1	4.2	3.5	2.4	2.5	1.4	1.1	0.6	1.0
RRA	19.7	29.1	40.2	44.9	69.6	74.6	118.7	126.7	128.1	136.7	123.7
European transition economies											
NRA agric.	na	na	na	na	na	na	na	10.0	18.3	16.1	17.0
NRA non-agric.	na	na	na	na	na	na	na	9.8	5.5	4.6	2.7
RRA	na	na	na	na	na	na	na	0.1	12.2	11.0	13.9
Western Europe											
NRA agric.	43.8	57.0	67.5	45.7	56.3	74.4	82.0	63.4	43.6	36.8	18.5
NRA non-agric.	8.0	7.2	5.7	3.8	2.5	1.5	1.7	1.3	1.5	1.4	1.2
RRA	33.1	46.5	58.6	40.4	52.6	71.9	79.0	61.3	41.5	34.9	17.1
North America											
NRA agric.	12.5	10.5	10.9	7.5	7.6	13.8	20.2	16.1	11.4	17.3	11.2
NRA non-agric.	6.1	7.4	7.4	5.5	4.1	3.8	3.7	3.3	2.1	1.5	1.3
RRA	6.0	2.9	3.3	1.8	3.4	9.7	15.8	12.4	9.1	15.5	9.7
Australia and New Zealand											
NRA agric.	5.5	6.6	8.3	7.9	7.3	10.6	8.7	4.3	2.9	1.0	0.6
NRA non-agric.	20.0	21.5	24.0	19.7	14.3	13.5	10.3	6.4	3.4	2.4	2.4
RRA	-12.1	-12.2	-12.6	-9.9	-6.1	-2.6	-1.5	-2.0	-0.5	-1.4	-1.8
All developing countries ^b											
NRA agric.	na	-24.0	-27.3	-31.9	-25.5	-21.0	-15.6	-3.9	4.0	7.4	na
NRA non-agric.	na	58.3	60.0	45.8	37.3	34.6	27.0	16.7	9.8	6.3	na
RRA	na	-52.0	-54.5	-53.3	-45.8	-41.3	-33.6	-17.6	-5.3	1.1	na
All high-income countries											
NRA agric.	23.0	30.9	36.8	26.5	34.7	43.0	55.5	48.2	36.6	33.9	18.3
NRA non-agric.	7.5	8.5	7.7	5.4	3.6	3.4	3.2	2.5	1.7	1.3	-0.7
RRA	14.3	20.6	27.1	19.9	30.1	38.3	50.6	44.6	34.3	32.1	19.2
World ^b											
NRA agric.	na	5.6	7.6	0.8	2.6	5.7	18.7	19.7	18.4	18.6	na
NRA non-agric.	na	19.0	20.5	16.1	13.7	10.0	9.8	7.6	6.0	4.0	na
RRA	na	-11.3	-10.7	-13.2	-9.8	-3.6	8.1	11.3	11.8	14.0	na

Source: Anderson and Valenzuela (2008), based on estimates reported in the national country studies summarized in Anderson (2009).

a. The RRA is defined as $100 \times [(100 + \text{NRA}_{\text{ag}}) / (100 + \text{NRA}_{\text{nonag}}) - 1]$, where NRA_{ag} and $\text{NRA}_{\text{nonag}}$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

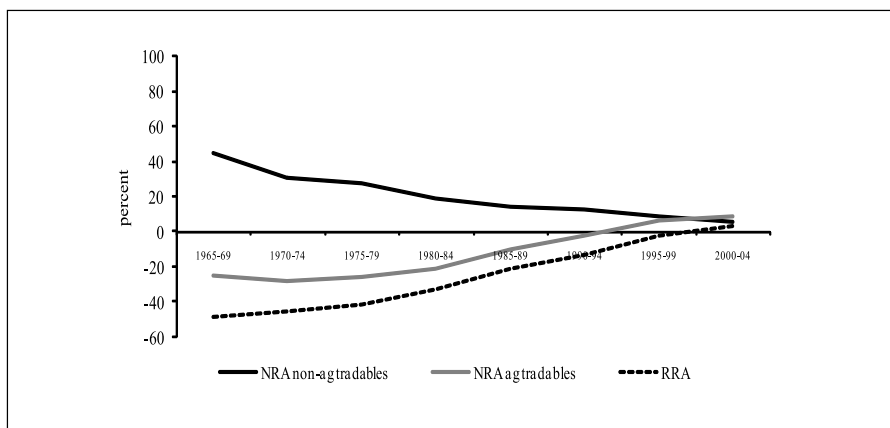
b. Estimates for China pre-1981 and India pre-1965 are based on the assumption that the nominal rate of assistance to agriculture in those years was the same as the average NRA estimates for those countries for 1981-84 and 1965-69, respectively, and that the gross value of production in those missing years is that which gives the same average share of value of production in total world production in 1981-84 and 1965-69, respectively. Developing and world country aggregates are computed accordingly.

FIGURE 7.5

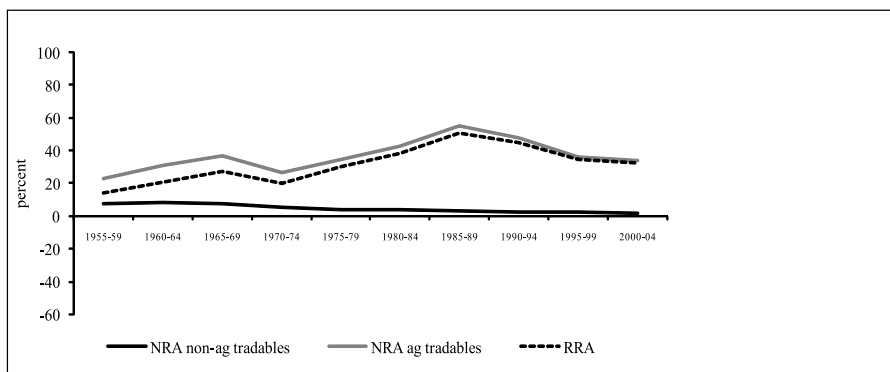
Nominal rates of assistance to agricultural and non-agricultural tradable products and relative rate of assistance,^a all focus countries, 1955 to 2004

(percent)

(a) Developing countries (not including Europe's transition economies)^b



(b) High-income countries (not including Europe's transition economies)



Source: Anderson and Valenzuela (2008), based on estimates reported in the national country studies summarized in Anderson (2009).

a. The RRA is defined as $100 \cdot [(100 + \text{NRA}_{\text{agt}}) / (100 + \text{NRA}_{\text{nonagt}}) - 1]$, where NRA_{agt} and $\text{NRA}_{\text{nonagt}}$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

b. Estimates for China pre-1981 and India pre-1965 are based on the assumption that the nominal rate of assistance to agriculture in those years was the same as the average NRA estimates for those countries for 1981-84 and 1965-69, respectively, and that the gross value of production in those missing years is that which gives the same average share of value of production in total world production in 1981-84 and 1965-69, respectively.

for farmers. When decomposed by region, it is clear that Asia has been the major contributor to this dramatic reform (Table 7.4) and, within Asia, it is China and India that contributed most to that outcome (Anderson and Martin 2009).

In summary, the above estimates reveal the following five features of distortions to global agricultural markets:

- Growth in agricultural protection from import competition as per capita incomes rise is as much a phenomenon of developing countries as it is of high-income countries;
- Most assistance to farmers – all but one-quarter in high-income countries and all but one-ninth in developing countries – is due to barriers to farm imports (so tariff reductions matter far more than cuts to production subsidies, although the latter also need to be disciplined, for example though the WTO, if re-instrumentation to that other coupled form of assistance to farmers is to be avoided);
- Within the import-competing part of the agricultural sector there are still high tariff peaks for some commodities (so larger proportional reductions in high tariffs and a commitment to place a cap on farm tariffs would be helpful) ;
- The improvement in incentives for farmers in developing countries has come as much from reduced tariff protection in manufacturing as it has from reforms to agricultural policies; and
- The contribution of farm policy reforms to the improvement in incentives for farmers in developing countries has come mostly from reduced export taxation.

7.2 Economy-wide effects of past reforms and of remaining policies

Before discussing implications of the above findings, it is helpful to assess the global trade and welfare effects of the agricultural and trade policy reforms of the past quarter-century, and to compare them with the effects of remaining distortions. Such an assessment is provided by Valenzuela, van der Mensbrugge and Anderson (2009) using a global economy-wide model (the World Bank's Linkage Model – see van der Mensbrugge 2005). Using a combined retrospective and prospective analysis, they show how far the world has come, and how far it still has to go, in removing the disarray in world agriculture. They quantify the impacts both of past reforms and current policies by comparing the effects of the above distortion estimates for the period 1980-84 with those of 2004.

Several key findings from that economy-wide modeling study are worth emphasizing. First, the policy reforms from the early 1980s to the mid-2000s improved global economic welfare by \$233 billion per year, and removing the distortions remaining as of 2004 would add another \$168 billion per year. This

suggests that in a global welfare sense the world had moved three-fifths of the way towards global free trade in goods over that quarter century: a significant achievement, with the Uruguay Round contributing slightly in so far as it pressured the EU to lower farm price supports from the early 1990s and begin to replace them with more-decoupled payments.

Second, developing economies benefited proportionately more than high-income economies from those past policy reforms (a boost to national income that averaged 1.0 percent, compared with 0.7 percent for high-income countries), and they would gain nearly twice as much as high-income countries by completing that reform process (an average increase of 0.9 percent compared with 0.5 percent for high-income countries). Of those prospective welfare gains from global liberalization, 60 percent would come from agriculture and food policy reform. This is a striking result given that the shares of agriculture and food in global GDP and trade are less than 7 percent. The contribution of farm and food policy reform to the prospective welfare gain for just developing countries is even greater than for the world as a whole, at 83 percent.

Third, the share of global farm production exported (excluding intra-EU trade) in 2004 was slightly smaller as a result of those reforms since 1980-84, because of less farm export subsidies. Primary agriculture's 8 percent share in 2004 contrasts with the 31 percent share for other primary products and the 25 percent for all other goods – a 'thinness' that is an important contributor to the volatility of international prices for weather-dependent farm products. If the policies distorting goods trade in 2004 were removed, the share of global production of farm products that is exported would rise from 8 to 13 percent, thereby reducing instability of prices and quantities of those products traded.

Fourth, the developing countries' share of the world's primary agricultural exports rose from 43 to 55 percent, and its farm output share from 58 to 62 percent, because of reforms between the early 1980s and 2004, with rises in nearly all agricultural industries except rice and sugar. Removing remaining goods market distortions would boost the developing countries' export and output shares to 64 and 65 percent, respectively.

Fifth, the average real price in international markets for agricultural and food products would have been 13 percent lower had policies not changed over the past quarter century. Evidently the impact of the RRA fall in high-income countries (including the cuts in farm export subsidies) in raising international food prices more than offset the opposite impact of the RRA rise (including the cuts in agricultural export taxes) in developing countries over that period. By contrast, removing remaining distortions as of 2004 is projected to raise the international price of agricultural and food products by less than 1 percent on average. This is contrary to earlier modeling results based on the GTAP protections database (e.g. Anderson,

Martin and van der Mensbrugge (2006) which estimated they would rise by 3.1 percent, or for just primary agriculture, by 5.5 percent). The lesser impact in these new results is because export taxes in developing countries based on the above NRA estimates are included in the new database (most notably for Argentina), whose removal would offset the international price-raising effect of eliminating import protection and farm subsidies elsewhere.

Sixth, for developing countries as a group, net farm income (value added in agriculture) is estimated to be 4.9 percent higher than it would have been without the reforms of the past quarter century, which is more than ten times the proportional gain for non-agriculture. If policies remaining in 2004 were removed, net farm incomes in developing countries would rise a further 5.6 percent (of which 5.4 percent would be due to agricultural policies), compared with just 1.9 percent for non-agricultural value added. Table 7.5 shows, however, that the gain in farm income is concentrated in East Asia and Latin America. Since they are the most wealthy developing country regions, that might suggest such reform would not necessarily be poverty alleviating. However, also relevant to the poverty impact is what happens to unskilled wages. Table 7.6 shows that returns to unskilled workers in developing countries – the majority of whom work on farms – would rise more than returns to other productive factors from that liberalization, especially when deflated by the food and clothing consumer price index. The only region where that would not be the case is (marginally) South Asia.

TABLE 7.5

Effects on agricultural and non-agricultural sectoral value added of full global liberalization of agricultural and all sectors' merchandise trade policies, 2004

(relative to benchmark data, percent)

	Agricultural policies		All sectors' policies	
	Agric value added	Non-ag value added	Agric value added	Non-ag value added
Developing countries	5.4	1.0	5.6	1.9
North Africa	-0.4	1.8	-1.1	0.8
Sub-Saharan Africa	0.3	0.3	-0.8	-0.5
East Asia	2.6	0.6	4.7	3.5
South Asia	-5.1	1.1	-6.7	-0.3
Latin America	36.3	2.8	37.0	2.3
Middle East	26.3	0.5	25.4	0.9
Eastern Europe & Central Asia	-4.4	0.3	-5.2	0.3
High-income countries	-13.8	0.2	-14.7	0.1
World total	-1.0	0.4	-1.2	0.5

Source: Anderson, Valenzuela and van der Mensbrugge (2010).

TABLE 7.6

Impacts of full global merchandise trade liberalization on real factor prices, 2004 (relative to the benchmark data, percent)

	Nominal change deflated by aggregate CPI			Real change in unskilled wages deflated by:		
	Skilled wages	Capital ^a user cost	Land ^a user cost	Aggregate CPI	Food CPI	Food and clothing CPI
High-income countries	1.0	0.5	-17.9	0.2	3.3	3.3
Australia	0.4	0.8	9.4	1.3	0.0	1.6
New Zealand	-1.2	1.5	34.8	5.9	6.2	7.3
Canada	0.5	0.4	6.3	0.4	1.7	2.7
United States	0.2	0.1	-2.9	-0.1	-2.0	0.0
EU 15	1.7	0.6	-39.5	-0.1	4.2	3.6
Other Western Europe	3.1	3.1	-50.6	0.8	19.3	14.0
Japan	1.7	1.2	-29.3	0.9	6.5	6.0
Developing countries	3.0	2.9	1.6	3.5	5.5	5.9
North Africa	7.7	5.3	-0.5	7.0	9.3	10.4
Sub-Saharan Africa	3.2	3.8	0.2	3.2	4.4	5.3
East Asia	3.4	3.3	1.9	4.0	6.9	6.9
South Asia	2.3	1.2	-6.2	-0.6	-2.5	-1.9
Latin America	1.4	1.9	21.1	4.5	2.4	4.1
Middle East	2.9	4.7	43.8	8.3	17.0	16.5
Eastern Europe & Central Asia	3.2	2.6	-4.5	1.7	4.2	4.5
World total	1.3	1.2	-3.1	0.9	3.6	3.8

^a The user cost of capital and land represents the subsidy-inclusive rental cost.

Source: Anderson, Valenzuela and van der Mensbrugge (2010).

Seventh, under the full merchandise trade reform scenario, Table 7.7 reports that extreme poverty (the number of people surviving on less than US\$1 a day) in developing countries would drop by 26 million relative to the baseline level of just under one billion, a reduction of 2.7 percent. The proportional reduction is much higher in China and in Sub-Saharan Africa, each falling around 4 percent. It is even higher in Latin America (7 percent) and South Asia other than India (10 percent). By contrast, the number of extreme poor in India is estimated to rise, by 4 percent⁹. Under the more moderate definition of poverty—those living on no more than US\$2 per day—the number of poor in developing countries would fall by nearly 90 million compared to an aggregate baseline level of just under 2.5 billion in 2004, or by 3.4 percent (notwithstanding the number in India below \$2 a day still increasing, but by just 1.7 percent).

⁹ The rise in India is partly because of the removal of the large subsidies and import tariffs that assist Indian farmers, and partly due to the greater imports of farm products raising the border price of those imports.