

# Distortions to Agricultural Incentives in India and Other South Asia

Ashok Gulati and Garry Pursell

Visiting Fellow, Australia South Asia Research Centre  
Australian National University, Canberra  
[GGP28435@aol.com](mailto:GGP28435@aol.com)

International Food Policy Research Institute, New Delhi  
[a.gulati@cgiar.org](mailto:a.gulati@cgiar.org)

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# Distortions to Agricultural Incentives in India and Other South Asia

Ashok Gulati and Garry Pursell

This chapter deals with the distortions to price incentives for agriculture that result from the trade, exchange rate and domestic policies in place in the four main South Asian countries, by summarizing and comparing the findings and themes of the more-detailed case studies on India, Pakistan, Bangladesh and Sri Lanka.<sup>1</sup> Attention is paid most to India, which accounts for around four fifths of South Asia's population, GDP and agricultural GDP.<sup>2</sup> The principal focus is on the level of and trends in distortions for agriculture as a whole<sup>3</sup>, and how these have changed over time relative to those for non-agricultural traded sectors (principally manufacturing) in these countries. Previous studies have established that in India, Pakistan and Sri Lanka, policies strongly favored manufacturing over the principal agricultural crops, although the extent of anti-agricultural bias diminished considerably between the 1970s to 1995 (Pursell 1999, p. 30).<sup>4</sup> The new country studies extend the earlier estimates up to 2005 and back to 1965, and provide long term estimates of distortions to relative agricultural incentives in Bangladesh for the first time,<sup>5</sup>

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<sup>1</sup> This chapter is a synthesis of the authors' paper on India (Pursell, Gulati and Gupta 2009) and three other South Asian country studies, namely Ahmed, Bakht, Dorosh and Shahabuddin (2009), Bandara and Jayasuriya (2009), and Dorosh and Salam (2009). The analytical narratives are available in Anderson and Martin (2009), and the detailed estimates have been integrated into the project's global database (Anderson and Valenzuela 2008). We attempt to summarize the findings in a coherent manner rather than a critique of the findings and quantitative estimates in the individual country studies.

<sup>2</sup> These four countries account for over 98 percent of South Asian agricultural GDP. The region's smaller economies of Nepal, Bhutan and the Maldives were not included in the project, nor Afghanistan.

<sup>3</sup> Here and in some other places in this chapter the term "agriculture" is used broadly to include not only crop agriculture (including horticulture) and livestock activities – which is the focus of the global agricultural distortions project – but also inland and ocean fisheries and forestry activities. In the tables and figures reporting NRA estimates and in most of the rest of the text the word "agriculture" means crop agriculture, horticulture and livestock activities. Whether the broad or narrower meaning of the term is intended should be apparent from the context.

<sup>4</sup> Unless otherwise indicated, throughout this chapter national fiscal years are referred to as in the following examples: India 1997 = fiscal 1997/98 (April 1 1997-March 31 1998); Pakistan and Bangladesh 1997=fiscal 1996/97 (July 1 1996-June 30 1997); Sri Lanka 1997=fiscal 1997 (January 1 1997 –December 31, 1997).

<sup>5</sup> Bangladesh became independent from Pakistan in 1971 but separate data on the Bangladesh agricultural sector was not available until 1974. Before 1971 only limited data and NRA estimates on agriculture in the then East Pakistan

As well, these new studies broaden the coverage of previous research by including estimates for the fresh fruit and vegetables sector in India, and the dairying sectors in India and Pakistan. In South Asia both of these sectors account for large shares of the rural economy as measured by their contributions to GDP.

The chapter first summarizes how over the past four decades agriculture has steadily declined in relation to both the economies and the trade of the South Asian countries. This is followed by a discussion which points out that agriculture nevertheless still accounts for more than half of South Asian employment, that the share of food in household budgets remains very high, and that on both counts agricultural policies are highly sensitive politically. The next sections describe how the South Asian countries' trade policies have evolved and have interacted with exchange rate changes, especially during the period of the steady and in the end massive devaluation of the Indian Rupee which started in 1984 and ended in 1992. Quantitative evidence is then summarized, on the long term evolution of nominal rates of assistance to various agricultural sub-sectors (including via input subsidies) and to agriculture as a whole. This leads into a discussion of trends in incentives for farmers relative to incentives for producers of non-agricultural tradables (mainly manufactures). Finally, we discuss the political economy forces that are likely to influence the direction of future policies in the region, including the possibility that a strong pro-agricultural bias may emerge along the lines followed by more-advanced densely populated economies in East Asia and elsewhere.

### **Agriculture and the South Asian Economies**

The Indian agricultural economy is much larger than the agricultural economies of the other South Asian countries. In 2000 the country shares in total South Asian agricultural GDP were India 77 percent, Pakistan 11 percent, Bangladesh 8 percent and Sri Lanka 2.2 percent (with Nepal at 1.5 percent). Agriculture is more specialized in the smaller countries. In particular

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are included in the Pakistan country study. In particular there is no information on rice production, NRAs or policies in East Pakistan.

Pakistan specializes in wheat and Bangladesh in rice, but even so their production is much less than India's.

With economic development, the share of agriculture in the South Asian economies has steadily declined (table 1). Most of this decline has been in crop agriculture and horticulture. In India, at independence these two were more than half of GDP, but by 2003 they represented 15 percent of GDP. By contrast, in India and Pakistan the livestock sectors have grown faster than the rest of the rural primary sector. In India the livestock sector is about a quarter of agricultural GDP and in Pakistan almost half (while having a much smaller role in the rural economies of Bangladesh and Sri Lanka).

Fisheries and forestry are not included in the agricultural aggregates or the quantitative analysis of this project. They have relatively low GDP shares in India, Pakistan and Sri Lanka but, given the importance of fisheries in Bangladesh (in 2004 22 percent of broadly defined agriculture including fisheries and forestry), caution is in order in generalizing from the analysis below for Bangladesh's broader rural economy.

### *Agriculture and trade*

For India, international trade in agricultural products (understood in the broad sense to also include livestock, fish and forest products) has always been tiny in relation to the size of India's agricultural sector. In 2003/04 imports of these products were only 0.6 percent of the value of sectoral production (2.4 percent with edible oil imports included) and exports were 5.7 percent of production. In earlier periods agricultural imports and exports had major shares in total Indian trade (e.g. in 1961 they were respectively 27 percent and 44 percent of total merchandise imports and exports), but each still only accounted for just above 3 percent of agricultural production. From around the late 1960s agricultural imports were substituted by domestic production, and since then they have constituted very small shares of total imports, even in years when there were imports of products such as wheat and sugar due to poor seasons.

Over time the share of agricultural products in India's total merchandise exports has also declined, in recent years to around 10 percent. However the products exported are very diverse: they include fish and fish preparations, oil cakes, cashew kernels, tea, coffee, tobacco, spices, fruit and vegetables, pulses, basmati rice and, periodically, large quantities of sugar and common

rice (e.g. over 4 million tons of rice during 2004). Since the late 1980s manufactures have usually accounted for 70-80 percent of India's total merchandise exports, compared to between 40 percent and 50 percent during the 1950s and 1960s. Indian service exports have also been growing very rapidly in recent years. The most dynamic components are software exports, other information technology related exports, and service outsourcing. Together, exports from these activities were about \$US20 billion during 2004, touched \$50 billion in 2008, and were increasing at about 20 to 25 percent annually. There is so far no similar development in the other South Asian countries.

Agricultural trade has also declined in Pakistan, Bangladesh and Sri Lanka, both in relation to total agricultural production and as a share of total exports and imports. On the import side, as in India, this was mainly a consequence of determined policies aimed at foodgrain self sufficiency, especially through "green revolution" technologies. Currently Pakistan exports rice and during normal seasons is self sufficient in wheat. Similarly, Bangladesh is self sufficient in rice during normal seasons, and imports small quantities of wheat. Sri Lanka is normally self sufficient in rice, but this is an outcome of substantial imports of wheat which is not produced domestically and which (as flour) has increased over time as a share of household consumption.

The outcome of these changes is that in Pakistan "primary commodities" (including cotton) are currently around 11 percent of total imports and 11 percent of total exports, compared with 26 percent of total imports and 39 percent of total exports in 1973 (Hamid et al. 1990). In Sri Lanka, agricultural exports (mainly tea, rubber and coconut products) were over 90 percent of total exports during the 1960s and 1970s, but by 2005 their share had declined to 18 percent, the rest being industrial exports, almost entirely ready made garments. Over the same period agricultural and processed food imports declined from almost half of total imports to around 11 percent recently: most imports are now intermediate manufactured materials (especially textiles for the ready made garment exporters), machinery and equipment and manufactured consumer goods.

In Bangladesh the pattern is somewhat different. Ready made garments now dominate total exports: agricultural exports (at present almost entirely jute and shrimp) are usually about 7-8 percent of total exports compared with 40 percent (mainly jute and tea) in the mid-1970s. However, Bangladesh imports a wide range of agricultural products (wheat, cotton, sugar, edible oils, dairy products, spices, oil seeds, tobacco, and periodically rice). According to the official

trade statistics imports of these products varied between about 12 percent and 18 percent of total imports between 2001 and 2005, and this share had declined only slightly since the mid-1990s. But the share of agricultural products in Bangladesh's total imports would be considerably higher than this if allowance were made for well documented and very substantial unrecorded imports from India, especially of sugar and cattle.

The largest consistent quasi-agricultural imports in South Asia are edible oils. In India these expanded rapidly during the 1970s and early 1980s, and this triggered a major government program to substitute for the imports with domestic production. For a while edible oil imports declined, but despite very high tariffs (e.g. for palm oil in 2006, 80 percent applied to tariff values which, however, was brought down to 5 percent in 2008 in the wake of surging global prices), import growth resumed during the 1990s and the 2000s. During 2000-2004 Indian imports were running at about \$US2.5 billion annually and accounted for about 40 percent of domestic consumption. Edible oils (mainly palm oil from Malaysia and Indonesia) are also major imports in Pakistan, Bangladesh, Sri Lanka and Nepal. Tariffs are high, but not nearly as high as in India,<sup>6</sup> which creates strong incentives in neighboring countries, especially Bangladesh and Nepal, to smuggle edible oils into India.

### *Employment, food expenditure, and food safety nets*

In India, although the rural sector's contribution to GDP has declined by almost two-thirds since independence, in 2003 it still accounted for 58 percent of national employment. The shares of agricultural employment in Pakistan, Bangladesh and Sri Lanka have also come down during the past 40 years (Table 1) but, as in India, at a much slower rate than the decline in agriculture's share in GDP.<sup>7</sup>

Although slowly declining, the share of food expenditure in South Asian household budgets is very high, in Indian rural and urban areas during 2003 respectively about 54 percent

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<sup>6</sup> Indian palm oil and other edible oil tariffs were drastically reduced during 2008 in order to stabilize domestic prices during a surge in world edible oil prices.

<sup>7</sup> According to these statistics the overall agricultural employment share of the four countries during 2000-04 was 57 percent, but somewhat surprisingly, compared to India, the agricultural employment share was lower in Bangladesh (54 percent) and much lower (46 percent) in Pakistan. These contrasts between the South Asian countries' agricultural employment rates are very likely to a large extent the result of differences in the design of national employment surveys.

and 42 percent of total per capita consumption expenditure. The shares of food in the budgets of the poorest 10 percent was much higher, around 62 percent in rural areas and 58 percent in urban areas. With such high shares in family budgets, it is not surprising that food prices and food availability are highly sensitive politically. There is similar sensitivity to food prices in the other South Asian countries.

One of the key objectives that Indian government pursued since independence is to permanently eliminate the recurrence of catastrophic famines that occurred during the colonial period, and ensure basic foods to its citizens at affordable prices. In pursuit of these objectives, the government intervened in the food grain markets, and in 1958 established the present public distribution system (PDS), which had its roots in the rationing system introduced in 1939 during pre-war years. The current PDS sells basic foods at subsidized prices through large number (currently about 460,000) of “fair price” shops. In June 1997 the system was modified to Targeted PDS by distinguishing “below poverty line” (BPL) and “above poverty line” (APL) buyers, with the former eligible for especially low prices and the latter eligible to buy at prices which were only slightly below free market prices. In 2004 the total central government food subsidy was estimated at Rs 258 billion (about \$US 5.7 billion and 0.83 percent of GDP), defined as the excess of FCI’s total procurement handling and distribution costs over the subsidized sales value.

In the past similar policies to India’s were followed in Pakistan, Bangladesh and Sri Lanka, but most have been phased out and are no longer such important factors in the food grain and other agricultural markets of these countries. In Pakistan, ration shops were abolished in the late 1980s, although the government continues to subsidize wheat to private flour mills to keep the flour prices low for consumers. Bangladesh inherited a system of public grain distribution (rice and wheat) from its pre-independence period as East Pakistan, and this system became especially important following a 1974 famine. Sales of subsidized wheat and rice (about two thirds was wheat imported under food aid programs) continued during the 1980s, but during the early 1990s the subsidy rates were gradually reduced and phased out. Currently the principal safety net for poor consumers consists of food-for-work and food transfers, mainly of wheat. Following its independence, Sri Lanka also operated subsidy schemes for food grains distributed through ration shops. During the 1950s and 1960s this mainly consisted of imported rice, but later on -- as in Bangladesh -- wheat became the principal vehicle for the subsidies, as it could be

purchased more cheaply than rice on world markets. The subsidies were very large (some rice was distributed free) and had high budgetary costs, especially during the 1970s world price boom. In part due to the high budgetary costs, the subsidies were reduced after 1977 and the rice ration scheme was abolished in 1979. Since then the main objective of policy has been to keep consumer prices stable around “reasonable” price levels, balancing this objective against the maintenance of protection for paddy farmers.

### ***Input subsidies***

For the four South Asian countries, self-sufficiency in food grains has been a major objective. In pursuit of self-sufficiency, the “green revolution” development package comprised an array of government initiatives and subsidies for farmers. In India, for example, the largest of these farm subsidies are for electricity and fertilizers (Gulati and Narayanan 2003). Estimates of the incidence of the total of these two subsidies across 11 crop in 2004 are summarized in Table 2. In 2008, however, the fertilizer subsidy has assumed gigantic proportions, touching almost \$25 billion as global prices of fertilizers rose sharply, allowing domestic prices to remain largely unchanged.

In Pakistan about 80 percent of cropped area is irrigated. However, except for urea, most input subsidies were phased out or substantially reduced during the 1990s. Bangladesh inherited a complex system from Pakistan by which fertilizers, pesticides, seeds and irrigation (tubewell) equipment were supplied to farmers at subsidized prices by monopoly government organizations. With the important exception of the fertilizer subsidies, these subsidies plus the accompanying controls were withdrawn in the late 1970s. Since then the principal farm input subsidy has been for urea: subsidies for non-nitrogenous fertilizers—all of which are imported—were abolished in 1991 but reintroduced in 2005. In Sri Lanka the government built a very large canal irrigation system (large relative to the size of Sri Lanka’s agricultural sector and economy) starting in 1979 and continuing during the 1980s. This supplies canal water at subsidized prices. There are also subsidies for fertilizers, seeds, extension and research. Of these the largest are the fertilizer subsidies.

### ***Trade and exchange rate policies: India***

For 45 years after its independence, India followed restrictive trade policies. During the 1950s and 1960s agricultural exports were controlled, and when exports were allowed, they were subject to high export taxes, for example on jute and jute products, oilcakes, cotton, tea and black pepper. Nearly all imports were either subject to discretionary import licensing or were “canalised” by monopoly government trading organizations. Import licensing was regularly tightened in response to the steadily worsening foreign exchange situation, and tariffs were increased and reached very high levels by early 1966. It is highly likely that the period’s policies were characterized by a marked anti-agricultural bias, which probably increased along with the increasing overvaluation of the exchange rate and the counter measures for industry which concentrated on providing higher incentives to manufacturers, both in the domestic market and to their exports, while attempting to keep agricultural prices low and stable.

In June 1966 the Rupee was devalued, and this was accompanied by a brief liberalization episode during which import licensing was relaxed, tariffs were cut, and export subsidies were abolished or reduced. However, the import licensing system remained intact and by 1968 most of the liberalizing initiatives had been reversed and tight import and domestic controls reinstated. This remained the situation until the end of the 1970s, when a new phase of very slow partial liberalization commenced. During these years inflation was steadily reduced, and by 1980 the real effective exchange rate (REER) had declined by 46 percent (figure 1). A balance of payments crisis was averted in 1980 and 1981 with the help of an IMF loan while maintaining the real value of the Rupee, but from about April 1985 a new policy commenced under which the currency was steadily devalued in real terms. This continued without a break for the next six years, almost on a monthly basis, until a large sharp devaluation was imposed in July 1991, followed by about another year of further depreciations until September 1992. The real Rupee devaluation was very large during the second half of the 1980s, about 62 percent between 1985 and 1990, and over the whole period to 1992 it was around 145 percent (figure 1).

Among other things, these devaluations radically changed the environment for India’s trade policies, and had important repercussions especially for the manufacturing sector, which was first exposed to liberalization policies. It made the trade liberalization program that started in 1991 (see below) quite painless. Also, many Indian manufacturing firms that had felt vulnerable to import competition now found that, following the correction of the earlier exchange rate

overvaluation, they could not only easily compete with imports but could outcompete foreign manufacturers in export markets. Combined with new sweeping domestic deregulation of manufacturing that accompanied the 1991 trade policy reform program, this created a new momentum in the manufacturing sector in terms of investment, productivity improvements, and output expansion. It also commenced a four-year program of tariff reductions, which brought tariffs down to levels which were far below the extremely high or prohibitive rates (averaging over 100 percent) of the 1980s, but which were still very high by international standards. But both domestic and trade policies affecting the rural sector were basically untouched by the 1991 reforms.

After 1992 and still continuing in mid-2008, the exchange rate has been managed by regular adjustments of the nominal rates (figure 1). In the mid 1990s – five years after the 1991 reforms – about two-thirds of tradable GDP was still protected by some kind of explicit non-tariff barrier: about 36 percent of manufacturing, 84 percent of agriculture, and 40 percent of mining. During the second half of the 1990s this began to change, in large measure as a response to international pressures linked to the Uruguay Round agreements and the negotiations associated with them. Starting in 1998, the general import licensing system was gradually dismantled, and on April 1, 2001 the last 715 of 2714 tariff lines (which included nearly all the agricultural tariff lines) were removed and the system itself was abolished.

After the lifting of the import licensing controls, existing tariffs proved more than adequate to keep out competing imports, both manufactured and agricultural. At the same time, manufactured exports entered a new phase of very rapid expansion which was still continuing in 2007 (at around 20-25 percent annually), and this was supplemented by similar fast growth of services exports. Together with increased capital inflows, these developments created a strong balance of payments and historically high foreign exchange reserves (more than \$300 billion by August 2008), and were accompanied by fast general economic growth (almost 9 percent per year during 2005-08).

Responding to the new confidence that these changes created, in April 2003 a new program of drastic reductions in industrial tariffs commenced, which over the next four years reduced the average by approximately two-thirds, from over 33 percent to about 12 percent (figure 2). This was followed by a further reduction in the 2007 budget. After these cuts, as

measured by average ad valorem industrial tariffs, from being one of the world's most protected countries India became one of the world's low-protection countries.

However, from the beginning, agriculture and processed foods were left out of the new tariff reduction program. In 2006 unweighted average tariffs protecting these sectors (HS 01-24) were about 40 percent (figure 2), almost four times the level of India's average industrial tariffs and among the highest in the world. This high formal protection of agriculture, combined with high input subsidies, allows considerable scope for the past anti-agricultural bias of the system to move to a pro-agricultural policy bias. The situation on the agricultural tariff front, however, changed dramatically in 2007-08 when global prices shot up: India lowered tariffs on several commodities (especially edible oils and grains) and imposed export controls on rice, wheat and corn.

***Trade and exchange rate policies: Pakistan, Bangladesh and Sri Lanka***

Because of their common history as British colonies, it is not surprising that there are many similarities between the trade and exchange rate policies of Pakistan, Bangladesh and Sri Lanka since their independence, and India's policies. Soon after independence, Pakistan adopted an import substitution strategy which protected manufacturing firms against imports behind non-tariff and tariff barriers. Sri Lanka followed similar highly interventionist trade policies. When it seceded from Pakistan in 1971, Bangladesh inherited Pakistan's import substitution policies and gave them special emphasis, since up to that point few manufacturing activities had been established on its territory. Like India, during the 1960s Pakistan and Sri Lanka fixed their nominal exchange rates but inflation rapidly appreciated the real exchange rates. Both countries attempted to handle the resulting pressures on the current account by schemes which raised the Rupee price of foreign exchange for manufactured exports and also for remittances from nationals working in foreign countries. However "traditional" agricultural exports which accounted for the largest share of total export earnings (about 90 percent in Sri Lanka) were not only subject to the overvalued official rate, but also to export controls and high export taxes. In Pakistan these policies strongly discriminated against rice and cotton and before 1971 jute and tea, which were produced in the then East Pakistan. In Sri Lanka they discriminated against the principal export crops which were tea, rubber and coconut products.

A big devaluation of the Pakistan Rupee in 1971/72 – by about half in relation to the US dollar - for a while reduced the growing foreign exchange distortions. But during the rest of the 1970s domestic inflation continued to appreciate the real exchange rate and erode export competitiveness. This changed in 1981 when a long term series of nominal devaluations commenced which consistently exceeded the excess of Pakistan’s domestic inflation over average inflation in its principal trading partners. Real devaluation (as measured by Pakistan’s REER index) continued in just about every year between 1981 and 2004, and over the 23 years totalled about 137 percent, being particularly steep between 1984 and 1990 (about 67 percent).<sup>8</sup> As in India, this long term devaluation underpinned sweeping trade liberalization reforms during the 1990s, which removed most QRs and drastically cut tariffs. However Pakistan has retained its “positive list” system (a by-product of its difficult political relations with India) which prohibits imports from India of products not on the list. Combined with rules (enforced by both countries) against trade across the land border and bureaucratic obstacles to trade with Pakistan on the Indian side, bilateral trade – especially of agricultural products - has been emasculated and reduced to very low levels compared with its potential.

During Bangladesh’s early independence years after 1971, the Taka exchange rate initially reflected the devaluation of the Pakistan Rupee which occurred at the same time. But the general political, social and economic disruption caused by the secession war was exacerbated by drought and floods and led to high inflation. Despite continuing use of quantitative import restrictions and high tariffs, this created serious problems for the tradable sectors, and the government responded during 1975 with a very large Taka devaluation estimated at about 66 percent in real terms (Rahman 1994). The Taka continued to be devalued up to 1980, in real terms by about another 16 percent. Since 1980, in marked contrast to India and Pakistan, the Bangladesh exchange rate has been managed so as to keep the REER index quite stable around a slowly devaluing long term trend of just under 1 percent a year. During the 1980s this was sufficient to ensure that the secondary rate did not diverge very far from the official rate, and made it possible to gradually merge the two rates and unify them in January 1992. It was also sufficient to support a sweeping trade liberalization program which started slowly in the second half of the 1980s and sped up between 1991 and 1996 with the removal of most quantitative

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<sup>8</sup> For a discussion of real exchange rate changes in South Asia after 1980, see World Bank (2004, September, Vol. II, Ch. 1).

restrictions and drastic tariff reductions. This was possible principally because of the expansion of foreign exchange earnings from worker remittances and, in particular, from garment exports. However, further trade liberalization stalled and went into reverse from about 1997, with the increasing use of para-tariffs on top of customs duties and increased tariff escalation used to protect import substitution manufacturing and a number of agricultural products.

In Sri Lanka, from the late 1950s to 1977, under the government's import substitution strategy exchange controls, tariffs and non-tariff barriers, and a formal dual exchange rate system after 1968 supported the official exchange rate at increasingly overvalued levels. In 1977 there was a major trade policy liberalization which included a nominal devaluation of about 75 percent, the abolition of the dual exchange rate system, substantial reductions in quantitative restrictions and tariff protection of manufacturing and of some agricultural industries. Export taxes on plantation crops were reduced during the 1980s and eventually removed in 1992. A second wave of trade liberalization started in 1991/92 and continued - albeit erratically and with some backtracking - during the 1990s and into the 2000s. As in Bangladesh, this was made possible by the rapid and sustained expansion of garment exports, which now account for about 60 percent of total exports, compared with less than 10 percent before the 1977 reforms. Currently Sri Lanka has an open trade policy regime without non-tariff barriers and with moderate tariff-based protection of agriculture about equivalent to the tariffs protecting the import-competing sections of manufacturing. Within agriculture the most intervention-prone products are rice and some other import-competing food products, notably potatoes, onions and chillies. Input subsidies for agriculture have also continued, especially very substantial fertilizer subsidies.

### ***Regional agricultural trade***

A by-product of India's highly protective agricultural trade policies is that trade in primary and processed agricultural and livestock products between India and its South Asian neighbours has been badly hindered.<sup>9</sup> Ironically, the biggest hindrance has very likely been to Indian exports to these countries rather than to Indian imports from the region. However, in Bangladesh and Sri

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<sup>9</sup> Two exceptions are Bangladesh's rice imports from India and India's imports of raw jute from Bangladesh, both of which are subject to low tariffs. The the bilateral rice trade was interrupted in 2008 as a result of export restrictions India imposed on rice in order to insulate its domestic rice market from sharp increases in world rice prices.

Lanka it also reflects a realistic assessment that agricultural free trade with India would generate more agricultural imports from India than exports to India, in the process threatening the viability of some of these countries' more highly protected agricultural industries such as sugar, various fresh fruits and vegetables and a wide range of processed foods in Bangladesh, and in Sri Lanka, rice, potatoes, onions and possibly dairy products. But bilateral trade between India and Pakistan is hostage to their difficult political relationship, which is reflected in Pakistan's "positive list" of products that can be legally imported from India. This list includes almost no agricultural products, in addition to which rules enforced in both countries (with a few minor exceptions) do not allow trade over the land border.<sup>10</sup>

### **Long Run Trends in Assistance to Agriculture**

The main focus of the present study's methodology is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Since it is not possible to understand the characteristics of agricultural development with a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), but it also generates estimates of distortions in non-agricultural sectors for comparative evaluation. Specifically, Nominal Rates of Assistance (NRAs) are computed for farmers including any input subsidies and non-product-specific forms of assistance or taxation. Also generated is a production-weighted average NRA for nonagricultural tradables, for comparison with that for agricultural tradables via the calculation of a Relative Rate of Assistance (RRA – see Anderson et al. 2008).

Figures 3 to 6 show long run trends during 1965-2005, for the four South Asian country case studies, of aggregate NRAs for agriculture, aggregate NRAs for manufacturing (plus mining in the case of India), and aggregate RRAs. We comment first on the agricultural sector NRA estimates, and then deal with the RRAs which illustrate how incentives for these countries' agricultural sectors have changed relative to incentives for the other principal tradable sectors.

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<sup>10</sup> For a discussion of the constraints on and potential of Indian-Pakistan bilateral trade see Naqvi and Schuler (2007).

### *Nominal rates of assistance*

Table 3 shows the agricultural sector products for which there are long term NRA estimates and which are included in the country aggregations. At undistorted prices, on average during 2000-2004, these products accounted for about 70 percent of the total value of Indian agricultural production. Following this project's methodology, the total includes all crops and livestock production but excludes fisheries and forestry. At the end of the period fruit and vegetables accounted for about one-third of the value of production in the Indian sample, raw milk for about one-fifth, paddy 17 percent, wheat 9 percent, and the other 9 crops (sorghum, maize, pulses, four different oilseeds, sugar cane and seed cotton) for the remaining 20 percent. In the 1960s and early 1970s wheat and rice were more than half the sample and fruit and vegetables about a quarter.

The Pakistan, Bangladesh and Sri Lankan agricultural sectors are much less diversified than India's, so few products account for large shares of their total agricultural production. Their long term NRA estimates include 7 products that accounted for 72 percent, 71 percent, and 64 percent, respectively, of the total value of production of their agricultural and livestock sectors during 2000-05. In Pakistan the dominant product is wheat, followed by milk – together these are generally just under half of total agricultural production and two thirds of Pakistan's aggregate NRA time series. In Bangladesh the dominant product is rice, which is generally 55-60 percent of the value of agricultural production and has about a three-quarter to four-fifths weight in the Bangladesh aggregate NRA time series. The other 5 products in the Bangladesh sample (wheat, sugar cane, fresh vegetables-represented by potatoes- jute and tea) together are only around 15 percent of agricultural production and have about a 20 percent weight in the aggregate NRA series.<sup>11</sup>

Table 2 also indicates the tradable status of the covered products. In the India case study over the 40 years, 4 of the 13 products were importable or non tradable, 2 were either exportable or non-tradable, and the remaining 7 switched between importable, exportable and non-traded status. However, the Pakistan, Bangladesh and Sri Lanka country studies have treated all the

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<sup>11</sup> Generalizations from this product sample to Bangladesh's rural sector as a whole need to be qualified, owing to the importance of fisheries (omitted from this study) in Bangladesh.

products included in their long run NRA samples as either importable or exportable over the whole period, with the exception of potatoes in Bangladesh (representing fresh vegetables) which is classified as non-tradable in every year. These differences in the treatment of tradable status in the four country case studies -- and therefore in the way NRAs are estimated -- complicate comparisons of their NRAs.<sup>12</sup>

As well as output price distortions, the aggregate long term NRA series in Figures 3 to 6 also include the output price equivalent of input subsidies expressed as a percentage of the undistorted price. In India these are the sum of fertilizer and electricity subsidies for which estimates are available since 1984. They have been allocated to the various crops in the manner summarized in Table 4. The Pakistan and Bangladesh NRA estimates include fertilizer subsidies, but Sri Lanka's could not be quantified and allocated to the covered crops.

There are a number of striking features of the aggregate NRA time series. First, in India, Pakistan and Bangladesh they average close to or just slightly below zero over the whole period, albeit with large fluctuations. Sri Lanka is different, with negative average NRAs up to 1993. These zero or negative NRAs in each of the four countries are despite pervasive non-tariff barriers to imports – especially during the earlier years -- and high tariffs continuing into the 2000s.

Secondly, in India, Pakistan and Bangladesh there is practically no trend in the agricultural NRAs over the 41 years surveyed, while in Sri Lanka there is a slowly increasing trend from about the late 1970s. This is despite a long term, very substantial decline in world agricultural prices during the same period.

Thirdly, in all four countries during most periods NRAs for importables have been positive while NRAs for exportables have generally been negative, so that the trade bias indices for exportables over the period have mostly been negative and quite high (Table 3). This is consistent with the policies followed until the early 1990s whereby export earnings from “traditional” agricultural exports were exchanged at overvalued official exchange rates and also

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<sup>12</sup> Another difference is that in the India and Pakistan case studies these price comparisons start with estimated fob and cif prices at the border, which are adjusted for port costs and domestic transport costs and margins as well to give import or export reference prices. However the NRAs reported in the Bangladesh and Sri Lanka studies compare domestic prices directly with cif or fob prices without taking account of port or domestic handling costs and margins.

subject to export taxes, and only “non-traditional” exports (in practice manufactures) received more favorable exchange rates and/or were eligible for export subsidies of various kinds.

Fourth, in all four countries the NRAs fluctuate widely around their trend values. These fluctuations are mainly due to large gyrations in international prices combined with largely successful efforts by South Asian governments to stabilize domestic prices. For example, in India the NRAs were lowest in 1974 when international agricultural prices were at record highs, and highest around 1987 when (in real terms) international agricultural prices were at record lows. For most of the past four decades, as also in 2007-08, export restrictions have generated an implicit export tax that has varied substantially as international prices have moved up.

Fifth, the dispersion of NRAs across the covered products is quite wide in each of the countries (Table 3). It is highest in Pakistan and Bangladesh, mainly due to the contrast between the high protection of sugar cane in both countries and (pre-1990) of milk in Pakistan, and the export taxes and hence negative NRAs of these countries’ exportables. In India NRA dispersion is affected by high protection of sugar cane, rape mustard seeds and (until the mid-1990s) of the dairying sector (milk). In Sri Lanka the width of the dispersion is mainly due to high protection of import substitution potatoes, onions and chillies contrasted with the taxation of agricultural exports. No obvious long term trend in dispersion is apparent in India and Bangladesh, but since about 1990 previously very high NRA dispersion seems to have come down in Pakistan, and was markedly lower in Sri Lanka during 2000-04 than in previous years.

Sixth, in India there has been a steadily increasing contribution to the NRA for covered products from the fertilizer and electricity subsidies. During 2000-04 subsidies contributed almost 10 percentage points to an average NRA of 16 percent. The Pakistan country study estimates that after 1990 the fertilizer subsidy adds about 3 percentage points to the NRAs for wheat, paddy, cotton and sugar cane, and about 7 percentage points before 1990 when non-nitrogenous fertilizers were also subsidized. The estimated contribution to NRAs in Bangladesh appears to be considerably lower however, with only about 1 or 2 percentage points added to the wheat and potato NRAs.

### *Relative rates of assistance*

The incentives facing farmers depend not only on the agricultural NRAs but also on how trade and other price-distorting policies affect incentives facing producers in other tradable sectors. In order to see how relative incentives have evolved in the four countries, Figures 3 to 6 compare the NRAs for agriculture (the middle line in each graph) with estimates of NRAs for non-agricultural tradables (the top line). Comparing these gives the relative rate of assistance (RRA), which is the percentage difference between the agricultural NRA and the non-agricultural NRA,<sup>13</sup> and (except for a few years in India) is the bottom line in each graph. Five year averages of each country's RRAs are shown in Figure 7.

The non-agricultural NRA series for India is a weighted average of estimated NRAs for manufacturing and mining. In Pakistan it covers all of tradable non-agriculture (but mainly manufacturing), and in Bangladesh and Sri Lanka just manufacturing is covered. The services sectors of the four countries are assumed to be non-tradable. Estimating a long term assistance rate series for a country's manufacturing and other tradable sectors would be a major research task on its own which could not be undertaken in this project, so the reliability of the estimates for these four countries depends on the availability of prior empirical research and the plausibility of the short cuts used. In this regard a major problem in South Asia is that tariffs are not reliable guides to protection levels – especially for manufacturing -- owing to their often prohibitively high levels and to pervasive quantitative trade restrictions in the past. The India case study was able to use the results of previous detailed research on trends in implicit manufacturing protection plus new estimates for India's mining sector, but the estimates for the other three countries are more problematic, especially the Bangladesh and Sri Lanka estimates which rely on inferences from changing tariff levels plus the assumption that the NRAs of manufactured exports were zero over the entire period. Consequently the non-agricultural NRA series and hence the RRAs are at best rough approximations which could change with further research.

Despite these shortcomings, the India and Pakistan non-agricultural NRA series are broadly consistent with the known history of these countries' trade policies, including periodic devaluations, longer term trends in their real exchange rates, and trade policy liberalization episodes. In particular in India the downward trend of India's non-agricultural NRA from very high levels in the 1960s was associated with the long term real Rupee devaluation that started

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<sup>13</sup> The RRA is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}) / (100 + \text{NRA}_{\text{nonag}}) - 1]$

with the 1966 devaluation and continued up to 1979, the massive continuing devaluation between 1985 and 1992, and the liberalizing trade policy reforms that started slowly during the 1980s, accelerated in 1991 and continued during the 1990s into the 2000s (figure 1). The Pakistan series (figure 4) reflects the sharp Rupee devaluation in 1971 which more than doubled Rupee border prices and correspondingly cut estimated implicit protection, the long term real devaluation that started in 1981, and the trade liberalization reforms of the 1990s. Non-agricultural NRAs trended down in Bangladesh (from 1994) and in Sri Lanka (from 1986) and this is consistent with the timing of import policy liberalization and both countries' rapidly growing garment export sectors. However, in other respects the connections between these series and real exchange rate changes and trade policy developments in these two countries is less apparent and could benefit from further research.<sup>14</sup>

Subject to these caveats, the South Asian RRAs tell some interesting stories. First, for all four countries they are negative in all years except the last four in India, indicating that incentives for these countries' rural sectors have been less than incentives for their non-agricultural tradable sectors. Secondly, they confirm earlier research which indicated that up to the mid-1980s there were very high anti-agricultural biases in the RRAs (here estimated at between minus 40 to minus 60 percent) in India, Pakistan and Sri Lanka, and expand this result to include Bangladesh where, according to these estimates, there was a similar very high anti-agricultural bias during the first half of the 1970s and a negative but less marked anti-agricultural bias into the mid-1980s. Thirdly, in India, Pakistan and Sri Lanka there has been a clear, long term decline in anti-agricultural bias: by the first five years of the present decade the Indian RRA indicator had turned slightly positive (about plus 10 percent) while the Pakistan and Sri Lankan RRA indicators were only mildly negative (about minus 12 percent on average). There are no equivalent long run trends in the Bangladesh series. According to these estimates, the anti-agricultural bias was still very high during the 1990s (between minus 20 and 36 percent), but this too came down during 1999 and after to an average of about minus 16 percent. Fourth, in India and Pakistan the long run downward trend in non-agricultural NRAs -- especially falling manufacturing protection rates -- have been by far the main force squeezing out the anti-agricultural bias. As discussed above, over the 41 years there was no clear long term upward

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<sup>14</sup> For example the 1977 devaluation and trade policy reforms do not show up in the Sri Lanka series, while the Bangladesh NRA series increases during the trade policy reform period in Bangladesh which removed quantitative restrictions and cut tariffs during late 1980s and the first half of the 1990s.

trend in these countries' agricultural NRAs. The pattern was different in Sri Lanka, where the long term increasing (less negative) trend of the RRAs resulted from both declining manufacturing NRAs and increasing (less negative) agricultural NRAs. Finally, the absence of any clear long term trend in Bangladesh's consistently negative RRAs is the result of approximately trendless NRAs for both agriculture and manufacturing. The latter is a somewhat unexpected result in view of the fairly comprehensive trade policy liberalization that occurred during the late 1980s and early 1990s, and the rapid expansion of Bangladesh's garment export industry.

### **Where Are South Asian Policies Heading?**

During the first five years of the 2000s, the RRA indicators discussed above indicate that with the apparent exception of Bangladesh, the past marked anti-agricultural discrimination created by the South Asian countries' trade and other policies had evolved to approximate neutrality between their agricultural and non-agricultural traded sectors. What is the likely direction of future policies in the region? Since what matters is relative protection or assistance, the answer to these questions depends on the probable direction of the trade and trade-related policies affecting these countries' non-agricultural sectors (especially manufacturing but also mining and increasingly internationally traded services) and their agricultural sectors. We comment first on the likely direction of non-agricultural trade policies, and then on the likely direction of agricultural policies.

As regards non-agricultural trade policies, protection levels in most of Indian manufacturing and also in mining are now constrained by low tariffs. Even in the few industries that are still protected by high tariffs – such as textile fabrics, garments and auto assembly – growing exports and domestic competition suggest that it is unlikely that prices are likely to rise much above world prices in the foreseeable future. India's large export oriented services sector is low cost and highly competitive internationally, and it is improbable that this will change in the foreseeable future. In Pakistan, Bangladesh and Sri Lanka, while nearly all manufacturing quantitative restrictions have gone, on average tariffs that are protecting import substituting

manufacturing are higher than in India. This is especially the case in Bangladesh where, since about 1997, the increasing use of para-tariffs on top of customs duties and steep tariff escalation have provided very high nominal and effective protection for many import substitution industries. On the other hand, these countries have large rapidly growing export industries, notably textiles and clothing in Pakistan and clothing (ready made garments) in Bangladesh and Sri Lanka. These export-oriented industries account for much larger shares of total manufacturing GDP than do India's manufactured exports -- about 40 percent in Pakistan, and probably a quarter to a third in Bangladesh and Sri Lanka. As long as the export expansion of these industries continues and is not slowed down or blocked by restrictive import policies, especially in developed countries, it seems unlikely that overall manufacturing protection will increase in the future, at least in Pakistan and Sri Lanka. The likely future direction of average manufacturing sector NRAs in Bangladesh is less certain, however, in view of the protection policies for the import substitution side of the sector that have been in place for the past 10 years.

If South Asia's non-agricultural trade policies remain relatively open and do not become more protective in the future, how relative assistance for agriculture will develop will principally depend on the future path of agricultural protection and subsidy policies. The political economy of this question is complex, with some forces and arguments making it likely that a high protection path for agriculture will be followed, and others constraining this kind of development.

Politically very important considerations that favor protection over open trade policies are the very high share of employment in the South Asian rural sector, the desire to insulate farmers from the large price fluctuations that occur in world agricultural markets, and the feeling that each country should be self sufficient, or nearly self sufficient, in the production of basic foods and other agricultural commodities. This feeling of self-sufficiency is reinforced during 2007-08 in the wake of surging global food prices, and export bans of staples by some countries. In India the argument for self sufficiency, and thereby protection, is further reinforced by the widely shared belief that Indian demand is too large to rely on world markets for supplies in the event of serious crop failures or other disruptions to supplies. Agricultural protection has an ethnic dimension in Sri Lanka, where past agricultural trade liberalization mostly affected Tamil farming areas and protection and subsidies favored Sinhalese farmers.

In India, the political economy forces enumerated above are the basic reasons for the exclusion of agriculture and the food processing industries from the liberalizing trade policy reforms in 1991, for the fixing of very high tariff bindings (most at 100 percent or 150 percent) during the Uruguay Round negotiations, and for leaving agriculture out of the unilateral tariff reduction program that started in 2003. Most of the UR Agreement on Agriculture tariff bindings of Pakistan (100 percent) and Bangladesh (200 percent) are also prohibitive or almost prohibitive: only Sri Lanka's bindings (all at 50 percent) seem to envisage limiting increases in applied tariffs to levels at which imports might be possible. But average applied agricultural tariffs in Pakistan and Sri Lanka (respectively 23 percent and 28 percent in 2003) are well below the Indian average of 40 percent in 2005.

On the other side, because of the very high share of food in South Asian family budgets, there are strong pressures to keep agricultural prices down. For many years this was a major objective of agricultural policies and was compatible with expanding production and increasing national self-sufficiency, largely resulting from successful adoption of "green revolution" technologies in crop agriculture. There were further benefits to low-income households from subsidized rice and wheat supplied through the PDS system in India and the equivalent schemes in Pakistan, Bangladesh and Sri Lanka.

There are no organized groups in South Asia representing the interests of food consumers, like those that represent farmers and food processors. Nevertheless, in all the South Asian countries politicians and bureaucrats are aware of, and sensitive to the consumer interest in food prices, especially mass staple products. In this way consumer interests remain important counter forces to producer lobbies pressing for higher agricultural prices. However, it appears that this is unlikely to provide much resistance to increasing agricultural protection if domestic and external conditions create strong producer pressures in that direction. Medium or long term scenarios favoring increasing protection could include the following elements: domestic production of major crops such as rice and wheat falling behind domestic demand, resulting in pressures for price increases and/or increases in input subsidies to maintain self sufficiency; falling world prices but domestic prices being maintained or even increasing slowly in real terms; real exchange rate appreciation reducing national currency border prices while domestic

prices remain about the same or slowly increase; and no or limited progress in reducing agricultural protection in developed countries in WTO negotiations.

Scenarios that might reduce or slow down pressures for increased agricultural protection could include a long run trend of increasing and more stable world prices. In this regard the medium and long term outcomes of the surge in world agricultural prices during 2007 and 2008 will be very important. If world prices stabilize at significantly higher levels than past averages, the South Asian countries are likely to lower tariffs on agricultural products, and even impose export bans (as India has done on common rice, wheat and corn), thereby reintroducing substantial anti-agricultural bias into their incentive systems. Other scenarios that might work against increased agricultural sector protection include yield and other productivity increases – including especially productivity increases in transport, storage and marketing; or successful WTO negotiations on the reduction of developed country protection and subsidies (especially export subsidies and domestic support) leading to greater willingness in South Asia to consider more open agricultural trade policies.

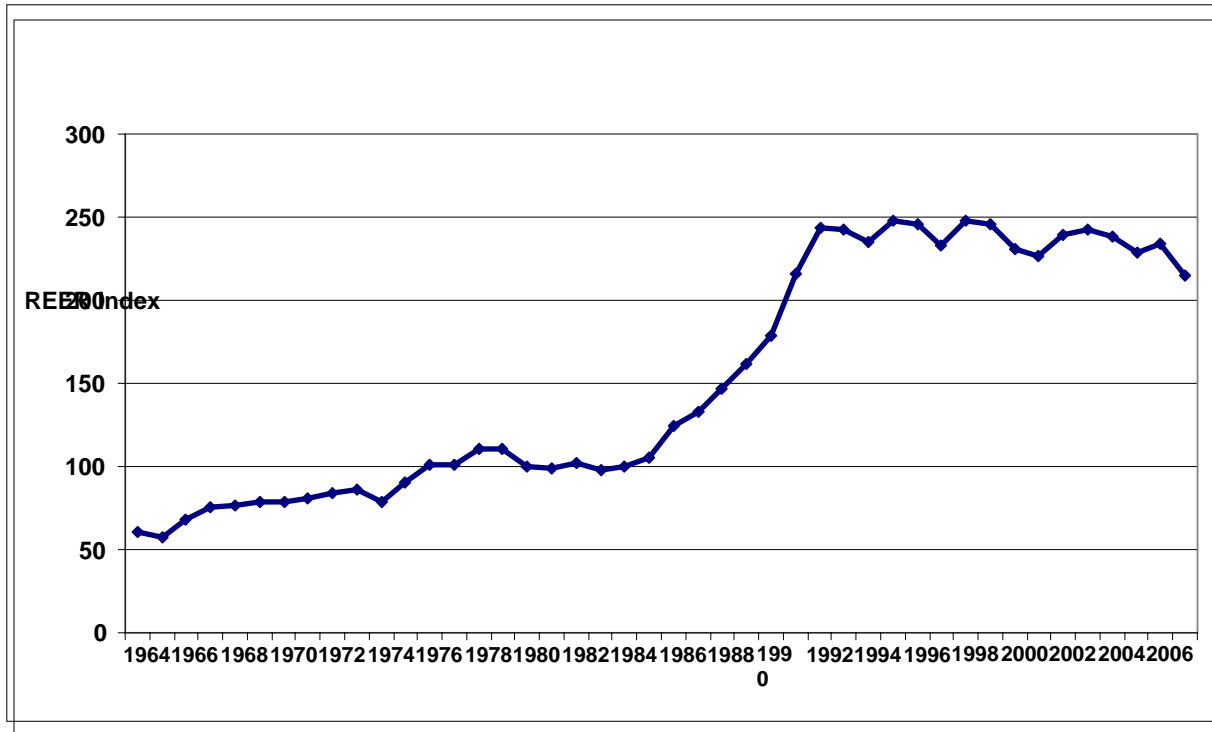
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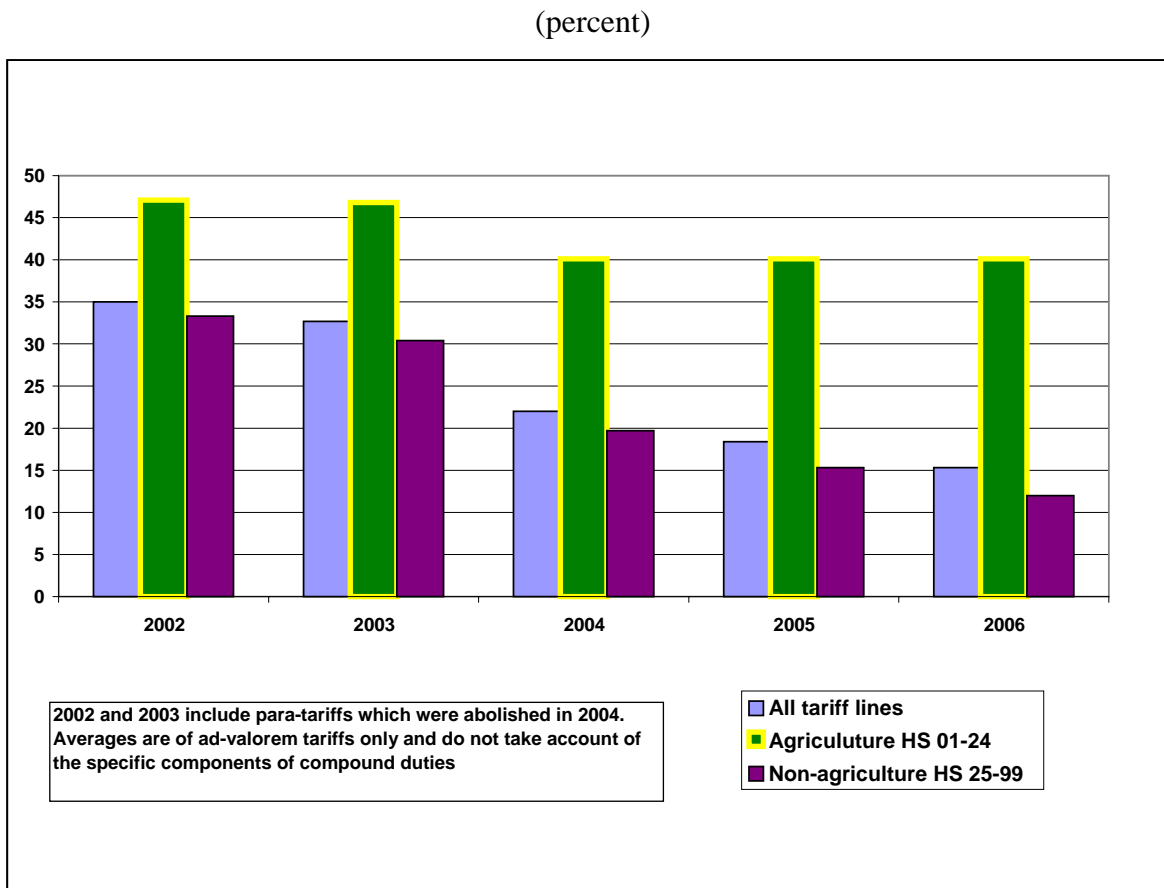
Figure 1: Real effective exchange rate index, India, 1964 to 2007

(1980=100; an increase is a devaluation)



Source: Authors' calculations based on official data

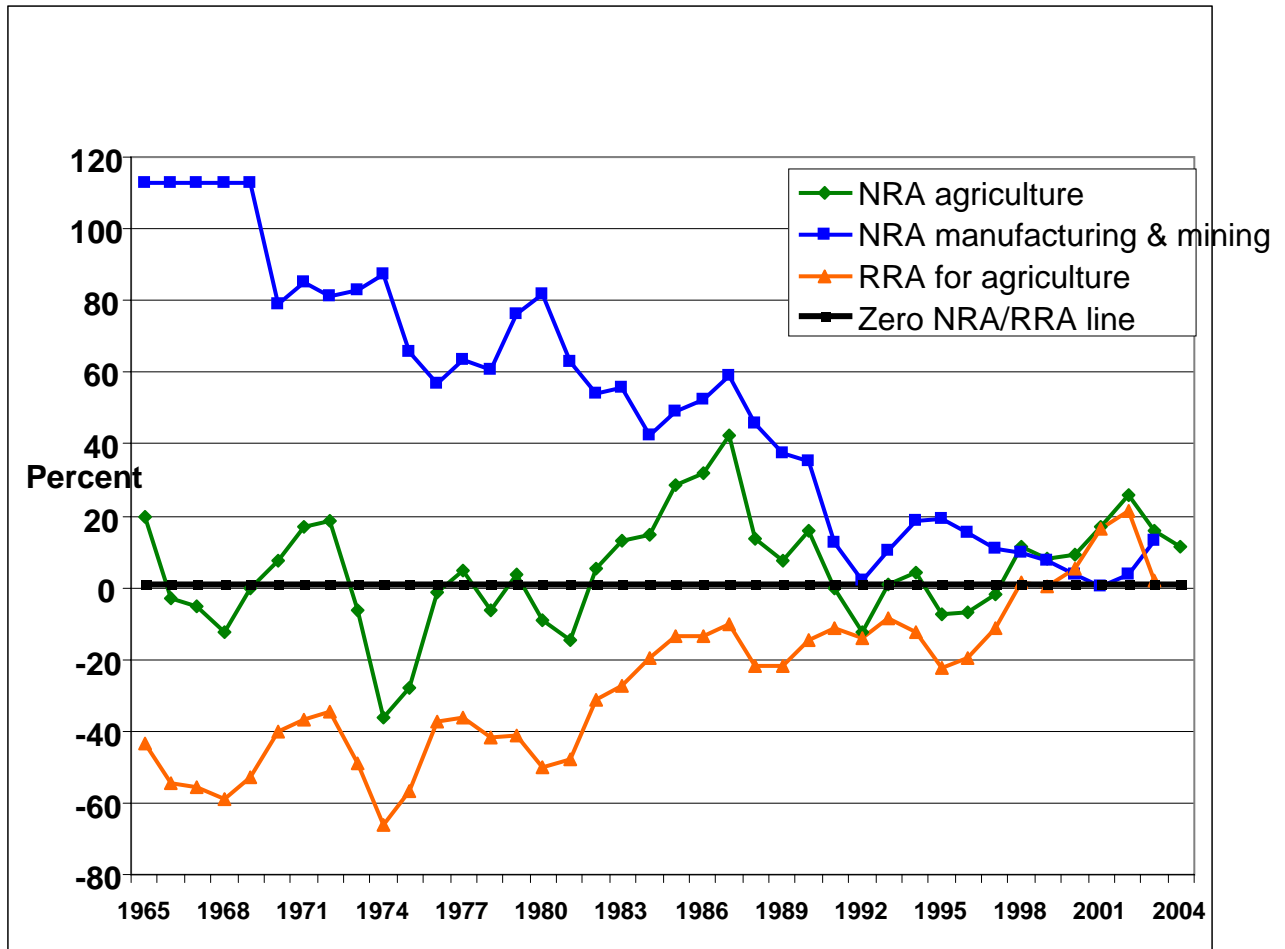
Figure 2: Unweighted average tariffs on imports of agricultural and non-agricultural goods, India, 2002 to 2006



Source: Authors' computation based on data in Goyal (2007-2008 and previous years).

Figure 3: NRA agriculture, NRA manufacturing and mining, and RRA agriculture,<sup>a</sup> India, 1965 to 2004

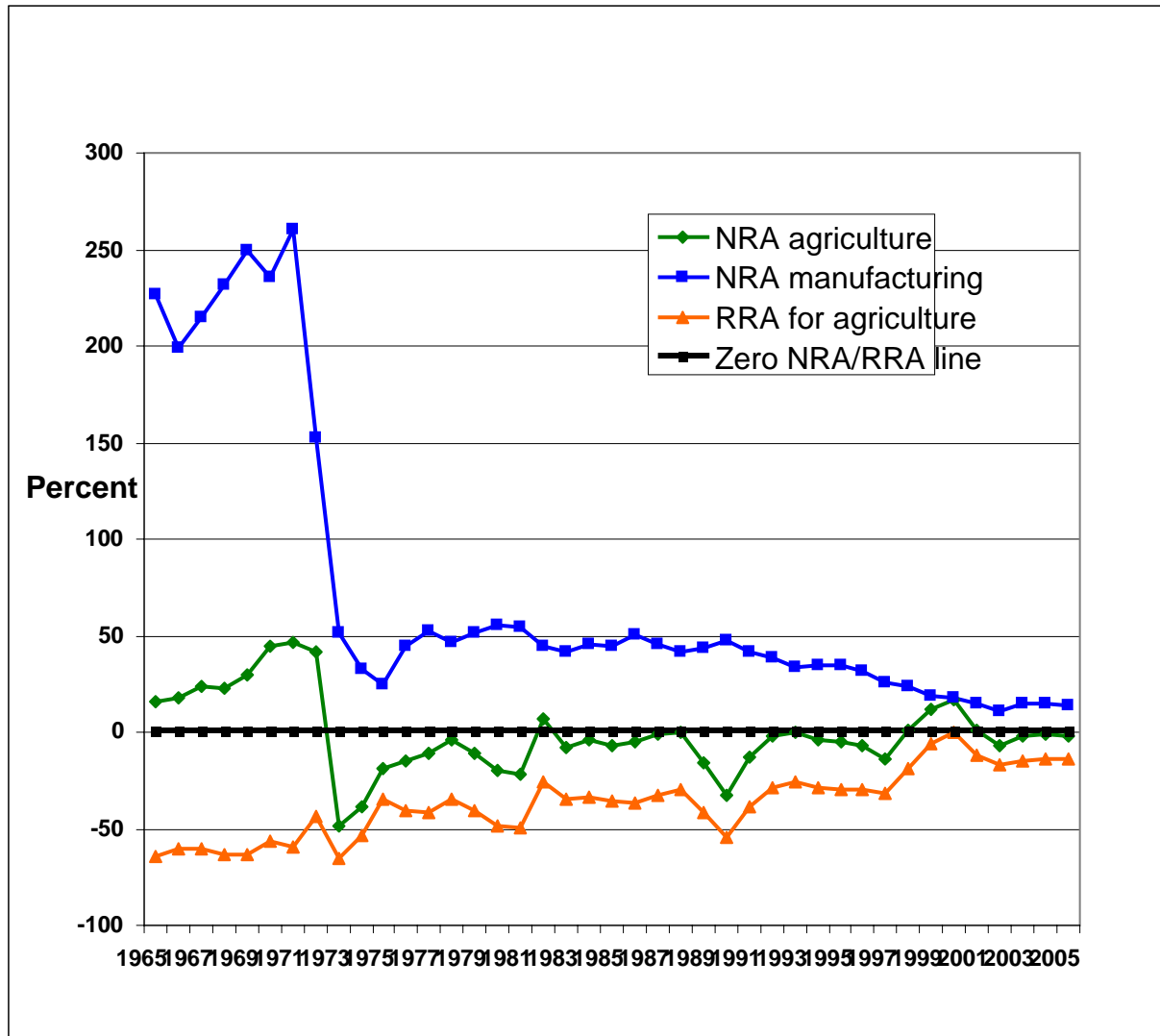
(percent)



<sup>a</sup> The Relative Rate of Assistance (RRA) is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{anonag}}^t) - 1]$ , where  $\text{NRA}_{\text{ag}}^t$  and  $\text{NRA}_{\text{anonag}}^t$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively. The 1965-69 manufacturing and mining NRAs are guesstimates.

Source: Pursell, Gulati and Gupta (2008).

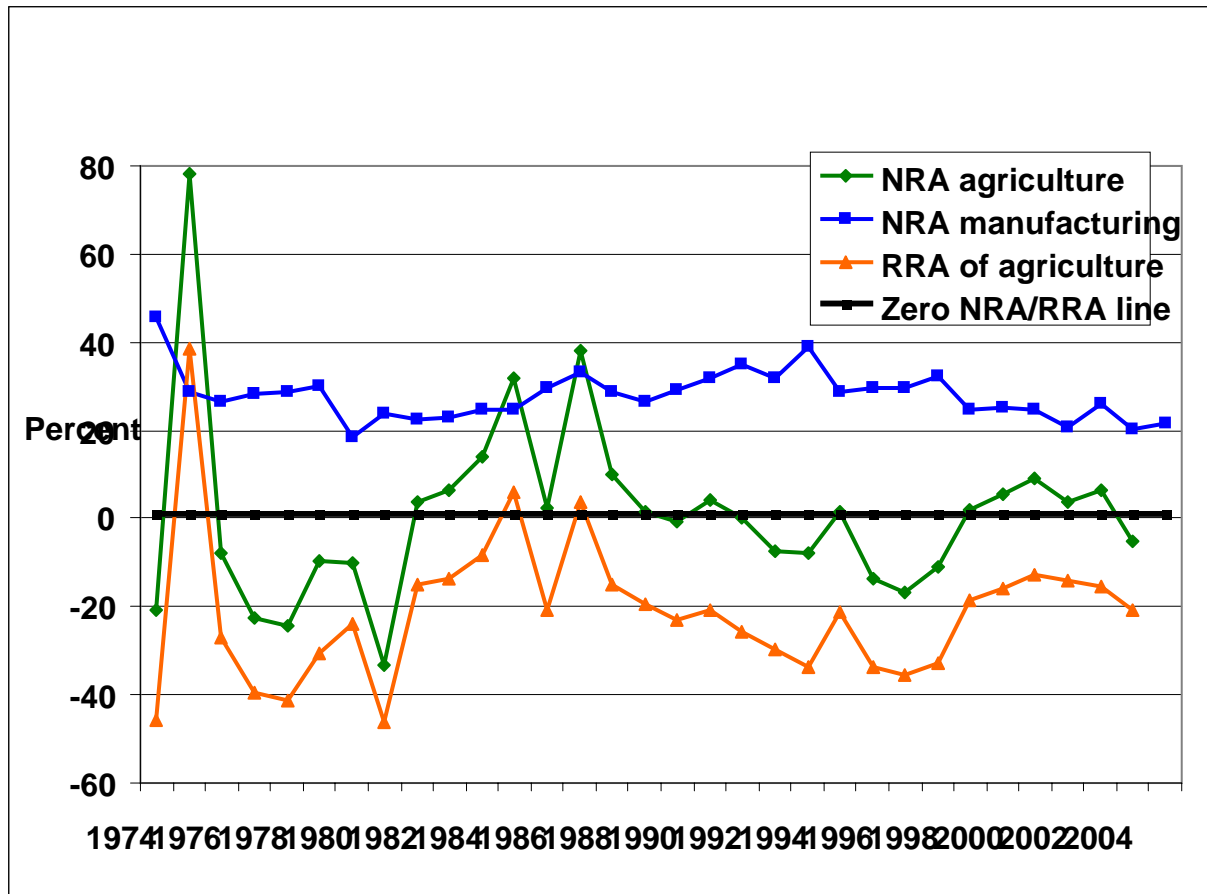
Figure 4: NRA agriculture, NRA manufacturing and RRA agriculture, Pakistan, 1965 to 2005  
(percent)



<sup>a</sup> The Relative Rate of Assistance (RRA) is defined in the note to Figure 3.

Source: Dorosh and Salam (2008)

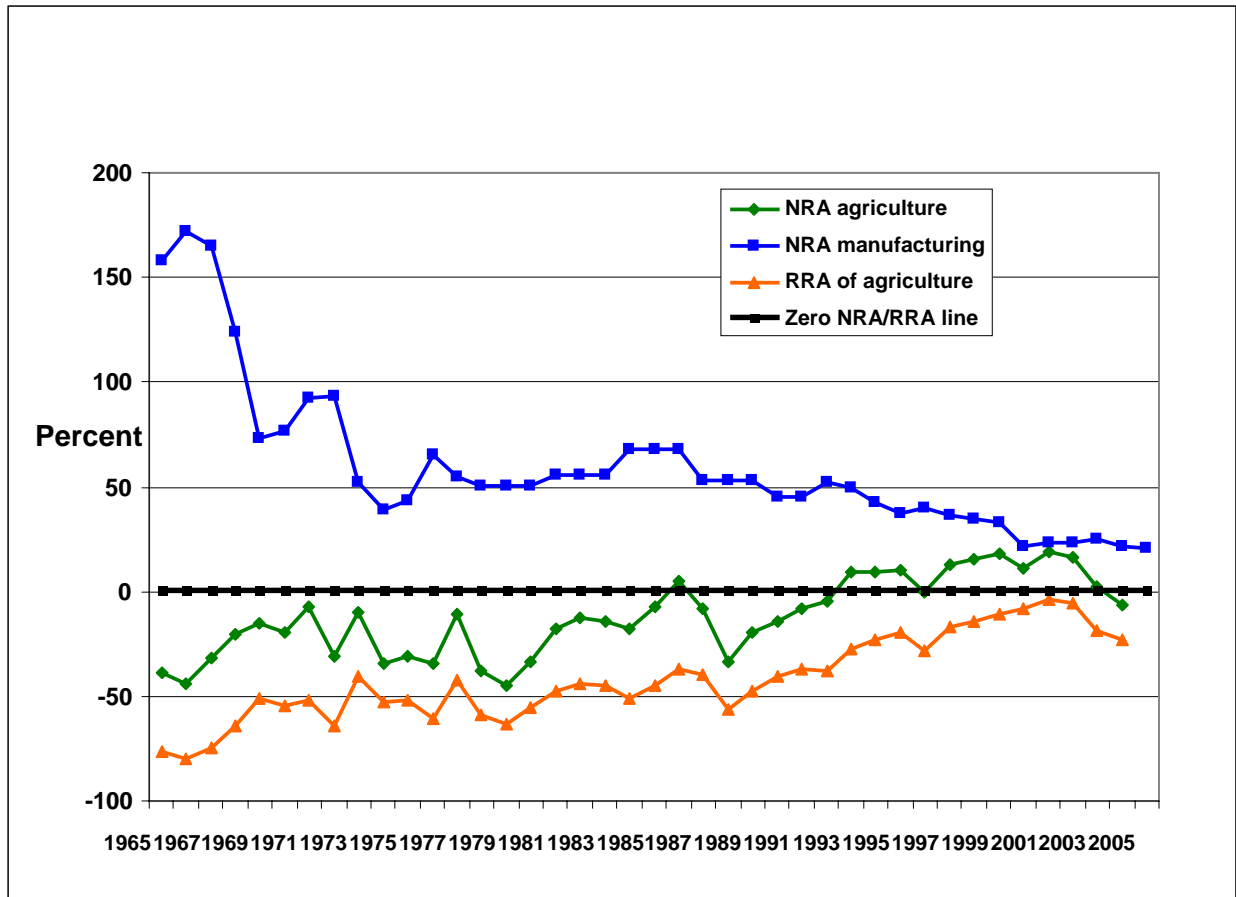
Figure 5: NRA agriculture, NRA manufacturing and RRA agriculture, Bangladesh, 1974 to 2005  
(percent)



<sup>a</sup> The Relative Rate of Assistance (RRA) is defined in the note to Figure 3.

Source: Ahmed, Bakht, Dorosh and Shahabuddin (2008)

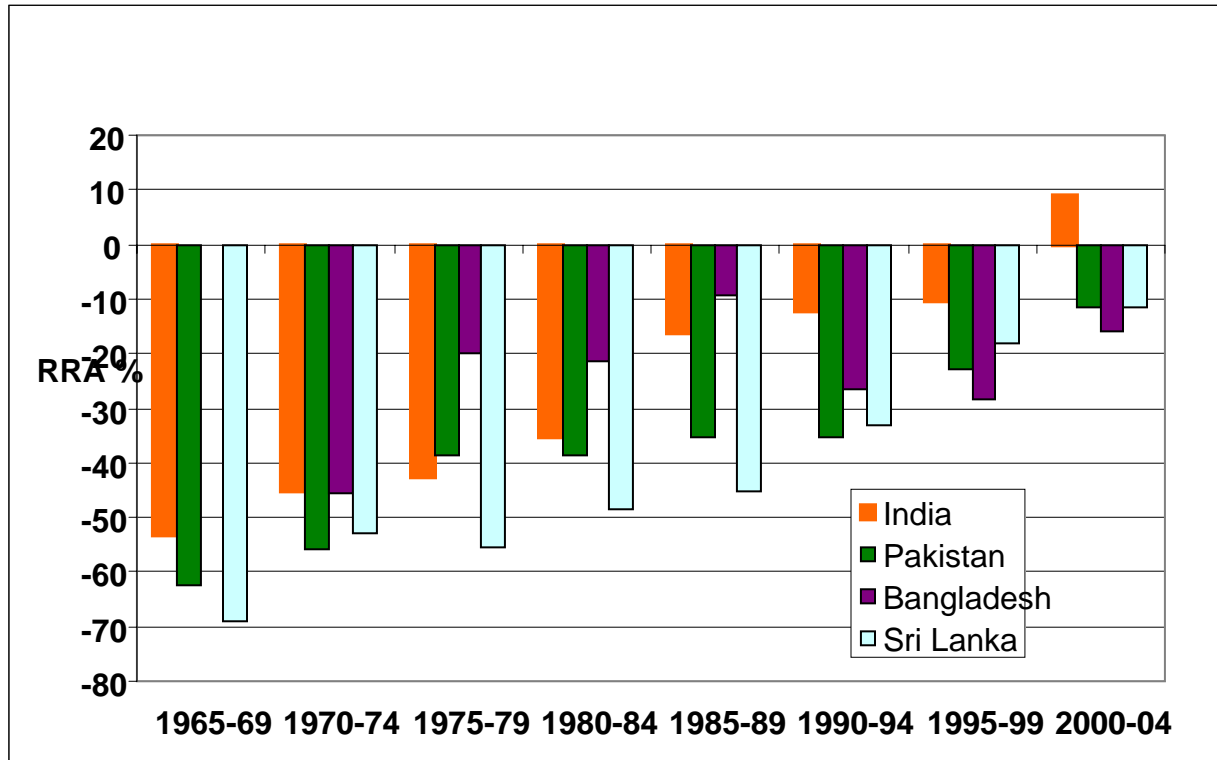
Figure 6: NRA agriculture, NRA manufacturing and RRA agriculture, Sri Lanka, 1965 to 2005  
(percent)



<sup>a</sup> The Relative Rate of Assistance (RRA) is defined in the note to Figure 3.

Source: Bandara and Jayasuriya (2008)

Figure 7: RRAs, South Asia, 1965 to 2004



<sup>a</sup> The Relative Rate of Assistance (RRA) is defined in the note to Figure 3.

Source: From Anderson and Valenzuela (2008), based on the country case study spreadsheets

Table 1: Shares of agriculture in GDP and employment, South Asian countries, 1965 to 2004

	(percent)			
	1965-69	1975-79	1985-89	2000-04
<b>Share of GDP</b>				
India	44	36	29	21
Pakistan	35	29	24	22
Bangladesh	n.a.	55	31	22
Sri Lanka	29	28	24	17
<hr/>				
South Asia (4-country sample)	43	36	29	21
<b>Share of employment</b>				
India	73	70	66	59
Pakistan	65	64	55	46
Bangladesh	n.a.	76	67	54
Sri Lanka	55	53	49	45
<hr/>				
South Asia (4-country sample)	74	70	65	57

<sup>a</sup>Aggregates for South Asia exclude Nepal, Bhutan and the Maldives, which together account for about 1.5% of South Asian agricultural GDP. Separate data not available for Bangladesh before it separated from Pakistan in 1971.

Source: Sandri, Valenzuela and Anderson (2007). Compiled from the World Bank's *World Development Indicators* and FAOSTAT.

Table 2: Distribution of fertilizer and electricity subsidies and subsidy rates for key crops, India, 2004<sup>a</sup>

(percent)

	Percent of total subsidy	Subsidy as percent of gross value of production at:	
		Domestic price	Reference price
Rice	37.1	18.3	15.4
Wheat	35.2	27.2	18.9
Maize	2.1	9.3	8.8
Sorghum	1.8	12.4	11.5
Chickpea	2.7	11.4	10.9
Groundnut	2.7	8.4	5.7
Rape/mustard seed	4.5	11.7	18.0
Soybean	1.1	4.3	2.9
Sunflower seed	0.5	8.8	8.6
Sugar	6.6	12.5	15.4
Cotton	5.6	13.2	12.3
Total: 11 crops	100.0	16.9	13.0

<sup>a</sup> The total value of the input subsidies for these 11 crops this year was \$US7.8 billion (\$1.9 billion for fertilizer and \$5.9 billion for electricity).

Source: Pursell, Gulati and Gupta (2009).

Table 3: Trade status of farm commodities, South Asian countries,<sup>a</sup> 1965 to 2005

	India	Pakistan	Bangladesh	Sri Lanka
Common rice/paddy	X/NT	X	M	M
Basmati rice/paddy		X		
Wheat	M/X/NT	M	M	
Maize	M/X/NT	M		
Sorghum	M/X/NT			
Pulses (chickpeas)	M/NT			
Groundnuts	M/X/NT			
Rape/mustard seeds	M/NT			
Soya beans	M/X/NT			
Sunflower seeds	M/NT			
Sugar/sugar cane	M/X/NT	M	M	
Cotton lint/seed cotton	M/X/NT	X		
Jute			X	
Tea			X	X
Rubber				X
Coconut/coconut products				X
Chillies				M
Potatoes			NT	M
Onions				M
6 fresh fruits & 7 vegetables	X/NT			
Processed & raw milk	M/NT	M		
% coverage 2000-04 or 2000-05	70	72	71	64

<sup>a</sup>M, X and NT indicates whether the product was classified as an importable, exportable or as a non-traded tradable. In Pakistan, Bangladesh and Sri Lanka all the covered products were classified as M or X for the entire period (except for Bangladesh potatoes which is classified NT and is assumed to represent all vegetables). The India study recognized that tradable status can change from year to year depending on the location of domestic prices with respect to import and export parity prices, so for example M/X/NT means that wheat was importable in some years, exportable in some years, and non-traded in others. The Bangladesh and Sri Lanka country studies do not allow for the port and domestic handling costs of imports and exports and compare domestic prices directly with cif or fob prices. Blank cells mean that a long term NRA series is not available for that product. The coverage percentages are the share of the total value of the output of the covered products in the country's total agricultural output, both measured at undistorted prices. The total value of agricultural output is at farm level and excludes fisheries and forestry activities. Including fisheries in total agricultural production would substantially reduce the Bangladesh coverage percentage.

Source: Authors' compilation, based on the country case study spreadsheets

Table 4: NRAs, trade bias indices<sup>a</sup> and dispersion of covered farm products,<sup>a</sup> South Asia, 1965 to 2004

(percent)

	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
<b>India</b>								
NRA importables	41	53	74	59	82	38	23	34
NRA exportables	-30	-22	-36	-28	-7	-15	-12	-6
NRA total agriculture	0	0	-6	2	25	2	1	16
Trade bias index	-0.51	-0.50	-0.63	-0.55	-0.48	-0.38	-0.28	-0.29
Dispersion (13 products)	42.8	17.8	6.5	18.8	49.0	46.6	12.5	24.1
<b>Pakistan</b>								
NRA importables	45	19	-4	-2	5	-8	-2	3
NRA exportables	-35	-20	-33	-29	-32	-17	-4	-7
NRA total agriculture	15	7	-8	-6	-4	-7	-2	1
Trade bias index	-0.55	-0.27	-0.31	-0.28	-0.35	-0.10	-0.02	-0.09
Dispersion (7 products)	105.6	74.5	43.2	49.6	65.2	32.2	27.7	39.5
<b>Bangladesh</b>								
NRA importables	n.a	-21	7	-2	24	0	-8	6
NRA exportables	n.a	-29	-35	-26	-32	-33	-10	-33
NRA total agriculture	n.a	-21	3	-4	17	-2	-8	4
Trade bias index	n.a	-0.10	-0.30	-0.23	-0.45	-0.33	0.00	-0.37
Dispersion (6 products)	n.a	52.1	71.4	67.6	190.7	77.5	67.9	101.2
<b>Sri Lanka</b>								
NRA importables	-6	9	-4	-1	-2	22	32	13
NRA exportables	-39	-41	-45	-31	-21	-24	-2	6
NRA total agriculture	-25	-16	-26	-14	-10	-1	12	9
Trade bias index	-0.35	-0.45	-0.43	-0.31	-0.18	-0.38	-0.25	-0.05
Dispersion (7products)	20.9	31.9	24.7	22.8	22.4	25	20.8	12.6

<sup>a</sup> The Pakistan statistics in the last column are the averages for 2000-05. The statistics for Bangladesh in the 1970-74 column are for 1974 only. The NRA for total agriculture include guesstimates of the average NRA of the non-covered section of the agricultural sector (which are not based on explicit price comparisons). Because of differences in the way importables and exportables are defined the NRAs and trade bias indices (TBIs) for India cannot be compared with the TBIs for the other countries (see notes to Table 3).

<sup>b</sup> The trade bias index is  $TBI = (1 + NRA_{ag_x}/100)/(1 + NRA_{ag_m}/100) - 1$ , where  $NRA_{ag_m}$  and  $NRA_{ag_x}$  are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

<sup>c</sup> Dispersion of the NRAs of the covered products (including products classified as non-traded) is the simple 5 year average of the annual standard deviation around the weighted mean NRA of all covered products (i.e. importables, exportables and non-traded).

Source: From Anderson and Valenzuela (2008), based on the country case study spreadsheets

## Appendix

This Appendix summarizes the annual estimates, for each of the four focus South Asian countries, of key distortion indicators defined in Anderson et al. (2008). Four tables are provided for each country: (a) the Nominal Rate of Assistance to individual farm products covered in the study and their weighted average, using as weights production valued at undistorted prices; (b) the Relative Rate of Assistance to producers of agricultural (relative to non-agricultural) tradables, again using as weights production valued at undistorted prices, and the component parts of the RRA calculation; (c) the weights themselves for individual covered farm products and for the residual non-covered group of products, shown as percentages and so they sum to 100 percent; and (d) the trade status of each covered product each year.

The Nominal Rate of Assistance (NRA) in the case of a product having just its output price distorted by government policies is the percentage by which the domestic producer price exceeds the price that would prevail under free markets, that is, the border price appropriately adjusted to account for differences in product quality, transport costs, processing costs, etc. A negative value indicates the domestic price is below that comparable border price. If producers of that product also are affected by distortions to product-specific input prices, their ad valorem equivalent is accounted for by subtracting the ad valorem input price distortion times its input-output coefficient from the farm industry's output NRA to get the total nominal rate of assistance to production of that farm product.

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

The sources of these tables are the previously cited Working Paper versions of the South Asian chapters in Anderson and Martin (2009), each of which is downloadable in the Working Paper section of the project's website, [www.worldbank.org/agdistortions](http://www.worldbank.org/agdistortions). Also available at that website is the complete global distortions database (Anderson and Valenzuela 2008) and the other regional papers to appear in Anderson (2009). The references are provided below.

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Appendix Table 1: Annual distortion estimates, **Bangladesh**, 1974 to 2004  
(a) Nominal rates of assistance to covered products  
(percent)

	Jute	Potato	Rice	Sugar	Tea	Wheat	All covered
1974	-30	1	-26	74	1	39	-21
1975	-53	1	105	-9	-4	140	78
1976	-33	2	-5	-19	-14	-6	-8
1977	-43	2	-26	65	-14	18	-23
1978	-38	2	-28	209	-23	9	-24
1979	-19	2	-13	213	-17	-9	-10
1980	-30	0	-12	137	-24	1	-10
1981	-40	1	-36	-13	-14	-19	-33
1982	-37	1	5	56	-5	-11	4
1983	-17	2	3	270	-9	-1	6
1984	-22	2	14	236	-2	1	14
1985	-21	2	39	715	-12	7	32
1986	-54	2	8	688	-59	14	2
1987	-44	1	42	338	-8	24	38
1988	-20	2	12	298	-9	16	10
1989	-38	2	1	140	-12	-5	2
1990	-28	3	-4	124	0	3	-1
1991	-33	3	2	137	-14	32	4
1992	-42	2	-2	194	-12	5	0
1993	-46	0	-11	205	-13	-3	-7
1994	-44	2	-12	171	-21	-14	-8
1995	-29	3	-1	124	-33	6	2
1996	15	3	-19	111	-18	-14	-14
1997	-3	3	-24	131	-21	-4	-17
1998	21	3	-15	138	-5	9	-11
1999	-32	2	-1	192	-26	16	2
2000	-37	1	2	308	-16	19	5
2001	-41	2	9	180	-18	-1	9
2002	-29	2	3	149	-27	-5	4
2003	-40	2	6	271	-22	-15	6
2004	-46	2	-8	212	-19	1	-5

Appendix Table 1 (continued): Annual distortion estimates, **Bangladesh**, 1974 to 2004  
(b) Nominal and relative rates of assistance to all<sup>a</sup> agricultural products, to exportable<sup>b</sup> and import-competing<sup>b</sup> agricultural industries, and relative<sup>c</sup> to non-agricultural industries  
(percent)

	Total ag NRA				Ag tradables NRA			Non-ag tradables	
	Covered products		Non-covered products	All products (incl NPS)	Export-ables	Import-competing	All		
	Inputs	Outputs							
1974	1	-21	0	-16	-29	-21	-22	46	-46
1975	0	78	0	57	-48	93	82	29	42
1976	1	-9	0	-6	-32	-6	-8	27	-27
1977	1	-24	0	-18	-39	-22	-23	28	-40
1978	1	-25	0	-19	-36	-24	-25	29	-42
1979	2	-11	0	-7	-19	-9	-10	30	-31
1980	1	-11	0	-7	-29	-8	-10	18	-24
1981	1	-34	0	-27	-36	-34	-34	24	-47
1982	1	3	0	3	-32	7	4	22	-15
1983	1	5	0	5	-16	8	6	23	-13
1984	1	13	0	11	-17	18	15	25	-8
1985	1	31	0	22	-19	43	33	25	7
1986	1	2	0	2	-55	16	2	29	-21
1987	1	37	0	26	-37	47	40	33	5
1988	1	8	0	7	-18	13	10	29	-15
1989	2	-1	0	1	-33	4	2	26	-20
1990	2	-3	0	0	-23	1	-1	29	-23
1991	2	3	0	3	-30	7	4	32	-21
1992	1	-1	0	0	-36	3	0	35	-26
1993	0	-8	0	-5	-39	-5	-8	32	-30
1994	1	-9	0	-5	-37	-6	-8	39	-34
1995	2	-1	0	1	-30	4	2	29	-21
1996	2	-16	0	-9	5	-15	-14	30	-34
1997	3	-19	0	-11	-8	-18	-17	30	-36
1998	2	-13	0	-8	13	-13	-12	32	-33
1999	2	0	0	1	-30	4	2	25	-18
2000	2	3	0	4	-31	8	6	25	-16
2001	2	7	0	6	-34	12	9	25	-12
2002	3	1	0	3	-28	6	4	21	-14
2003	3	3	0	5	-35	9	7	26	-15
2004	3	-8	0	-4	-37	-4	-6	20	-21

a. NRAs including assistance to nontradables and non-product specific assistance.

b. NRAs including products specific input subsidies.

c. The Relative Rate of Assistance (RRA) is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{nonag}}^t) - 1]$ , where  $\text{NRA}_{\text{ag}}^t$  and  $\text{NRA}_{\text{nonag}}^t$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Appendix Table 1 (continued): Annual distortion estimates, **Bangladesh**, 1974 to 2004  
(c) Value shares of primary production of covered<sup>a</sup> and non-covered products,  
(percent)

	Jute	Potato	Rice	Sugar	Tea	Wheat	Non-covered
1974	9	3	61	3	0	1	23
1975	5	4	57	7	0	0	27
1976	5	3	64	5	1	1	22
1977	7	2	67	3	1	1	19
1978	6	2	68	1	1	1	21
1979	8	2	60	1	1	1	26
1980	6	2	63	1	1	2	25
1981	4	2	69	4	1	3	18
1982	5	3	62	4	1	4	22
1983	5	2	64	1	1	4	22
1984	5	3	61	1	2	4	25
1985	9	3	52	1	2	4	29
1986	11	2	52	1	2	3	29
1987	4	3	54	1	1	3	33
1988	5	3	62	0	1	3	26
1989	4	3	63	2	1	3	24
1990	4	3	62	2	1	2	27
1991	5	2	60	2	1	2	27
1992	4	3	61	2	1	3	27
1993	3	3	58	2	1	3	30
1994	3	4	56	2	1	3	31
1995	3	3	58	2	1	3	30
1996	2	3	58	2	1	4	31
1997	3	3	56	2	1	4	32
1998	3	3	59	0	1	5	29
1999	2	5	58	1	1	4	29
2000	2	7	57	1	1	4	29
2001	3	4	56	1	1	4	30
2002	3	4	58	1	1	4	28
2003	2	6	58	1	1	3	28
2004	2	7	61	1	1	3	26

<sup>a</sup> At farmgate undistorted prices

Appendix Table 1 (continued): Annual distortion estimates, **Bangladesh**, 1974 to 2004  
(d) Trade status<sup>a</sup> of covered products

	Jute	Potato	Rice	Sugar	Tea	Wheat
1974	X	H	M	M	X	M
1975	X	H	M	M	X	M
1976	X	H	M	M	X	M
1977	X	H	M	M	X	M
1978	X	H	M	M	X	M
1979	X	H	M	M	X	M
1980	X	H	M	M	X	M
1981	X	H	M	M	X	M
1982	X	H	M	M	X	M
1983	X	H	M	M	X	M
1984	X	H	M	M	X	M
1985	X	H	M	M	X	M
1986	X	H	M	M	X	M
1987	X	H	M	M	X	M
1988	X	H	M	M	X	M
1989	X	H	M	M	X	M
1990	X	H	M	M	X	M
1991	X	H	M	M	X	M
1992	X	H	M	M	X	M
1993	X	H	M	M	X	M
1994	X	H	M	M	X	M
1995	X	H	M	M	X	M
1996	X	H	M	M	X	M
1997	X	H	M	M	X	M
1998	X	H	M	M	X	M
1999	X	H	M	M	X	M
2000	X	H	M	M	X	M
2001	X	H	M	M	X	M
2002	X	H	M	M	X	M
2003	X	H	M	M	X	M
2004	X	H	M	M	X	M

<sup>a</sup> Exportable (X), import-competing (M) and nontradables (H).

Source: Anderson and Valenzuela (2008), based on Ahmed, Bakht, Dorosh and Shahabuddin (2007)

Appendix Table 2: Annual distortion estimates, **India**, 1965 to 2004

## (a) Nominal rates of assistance to covered products

(percent)

	Chi ckp ea	Cott on	Fru it&v eg	Gro und nut	Mai ze	Mil k	Rap ese ed	Rice	Sor ghu m	Soy bea n	Sug ar	Sun flow er	Wh eat	All covt
1965	5	33	0	54	85	na	66	0	46	na	171	na	47	21
1966	4	6	0	24	81	na	40	-34	25	na	181	na	11	-2
1967	39	16	0	6	59	na	83	-37	65	na	126	na	19	-5
1968	0	0	0	16	36	na	64	-44	12	na	224	na	42	-13
1969	75	34	0	18	57	na	62	-35	60	na	90	na	39	0
1970	0	85	0	0	23	na	56	-16	35	na	52	na	58	8
1971	0	90	0	0	34	na	65	0	97	na	29	na	53	17
1972	0	122	0	8	106	na	72	0	39	na	59	na	41	19
1973	0	107	0	0	55	na	0	-34	48	0	0	na	0	-6
1974	7	-12	0	0	28	na	1	-67	56	0	-51	na	0	-36
1975	0	0	0	-31	-31	130	0	-58	0	-16	-69	0	0	-29
1976	0	30	0	-14	0	171	0	-36	0	-14	-16	0	-3	-1
1977	0	0	0	-21	20	176	27	-29	45	-6	8	0	18	5
1978	0	15	0	-18	24	137	34	-43	8	-28	30	0	0	-6
1979	0	0	0	0	0	149	22	-29	5	-10	0	0	0	3
1980	26	8	0	0	0	93	50	-45	0	0	-24	1	0	-9
1981	9	-9	0	25	0	68	46	-54	16	0	-18	3	-2	-15
1982	0	9	0	35	4	97	34	-30	10	0	25	28	0	6
1983	0	8	0	21	9	146	47	-13	4	0	21	0	0	13
1984	3	-14	0	28	-20	164	15	-13	2	-6	44	7	11	15
1985	34	6	0	41	4	186	12	6	24	9	93	52	12	29
1986	3	34	0	95	10	192	60	4	66	35	76	117	8	32
1987	5	90	0	124	86	178	136	8	56	44	68	65	14	43
1988	12	25	0	18	33	79	113	-21	19	5	37	5	18	14
1989	7	14	0	31	-1	49	53	-16	13	4	6	40	-6	8
1990	15	10	0	39	8	91	113	-18	6	5	6	45	29	16
1991	9	1	-17	36	11	48	77	-27	7	4	8	32	-5	0
1992	9	6	-32	4	-15	16	48	-30	-3	3	7	4	-9	-12
1993	6	31	-17	4	3	24	49	-13	-25	1	8	4	17	1
1994	7	65	-13	6	9	23	37	-17	51	3	8	5	21	4
1995	16	-6	-21	7	11	0	22	-9	2	4	-5	7	-13	-7
1996	11	-6	-9	6	-5	21	19	-31	9	3	9	11	-15	-7
1997	24	12	-17	8	-12	20	21	-21	13	0	11	10	35	-2
1998	10	14	-2	6	8	26	67	0	33	3	10	18	34	11
1999	14	16	-19	12	11	44	56	-5	50	5	37	21	31	8
2000	18	22	-13	13	12	14	53	15	13	7	29	17	38	9
2001	35	-1	0	11	12	31	36	18	16	7	9	19	36	17
2002	16	7	-5	17	16	59	72	29	16	10	44	16	47	26
2003	11	17	-14	15	9	40	89	19	15	-2	51	11	34	16
2004	13	15	-13	9	10	17	75	22	18	-8	63	10	37	11

Appendix Table 2 (continued): Annual distortion estimates, **India**, 1965 to 2004  
(b) Nominal and relative rates of assistance to all<sup>a</sup> agricultural products, to exportable<sup>b</sup> and import-competing<sup>b</sup> agricultural industries, and relative<sup>c</sup> to non-agricultural industries  
(percent)

	Total ag NRA				Ag tradables NRA			Non-ag tradables	
	Covered products		Non-covered products	All products (incl NPS)	Export-ables	Import-competing	All	NRA	RRA
	Inputs	Outputs							
1965	0	21	20	20	na	55	54	113 <sup>d</sup>	-56
1966	0	-2	-3	-2	-34	33	-4	113 <sup>d</sup>	-55
1967	0	-5	-5	-5	-37	35	-6	113 <sup>d</sup>	-56
1968	0	-13	-13	-13	-44	39	-17	113 <sup>d</sup>	-61
1969	0	0	0	0	-35	46	0	113 <sup>d</sup>	-53
1970	0	8	8	8	-16	53	12	79	-37
1971	0	17	17	17	0	61	61	85	-13
1972	0	19	19	19	0	53	53	81	-16
1973	0	-6	-6	-6	-34	73	-13	83	-52
1974	0	-36	-36	-36	-61	24	-50	87	-73
1975	0	-29	-28	-28	-57	77	-39	66	-64
1976	0	-1	-1	-1	-25	110	-2	57	-38
1977	0	5	5	5	-28	58	6	64	-35
1978	0	-6	-6	-6	-40	59	-9	61	-43
1979	0	3	3	3	-29	69	7	76	-39
1980	0	-9	-9	-9	-43	57	-15	82	-53
1981	0	-15	-15	-15	-39	42	-18	63	-50
1982	0	6	5	6	-30	46	9	54	-29
1983	0	13	13	13	-13	54	21	56	-22
1984	3	11	15	15	-14	95	23	42	-13
1985	5	24	29	29	4	99	85	49	25
1986	3	29	32	32	0	102	102	52	32
1987	5	38	43	43	0	122	123	59	40
1988	5	9	14	14	-21	49	18	46	-19
1989	5	3	8	8	-13	35	10	37	-20
1990	7	9	16	16	-14	72	21	35	-11
1991	5	-5	0	0	-19	42	-1	13	-12
1992	5	-17	-12	-12	-25	19	-15	2	-16
1993	5	-4	1	1	-10	27	0	11	-9
1994	7	-2	4	4	-9	31	4	19	-13
1995	7	-14	-7	-7	-13	2	-9	19	-24
1996	6	-13	-7	-7	-19	21	-9	15	-22
1997	7	-9	-2	-2	-18	20	-7	11	-16
1998	8	3	11	11	0	26	9	10	-1
1999	8	0	8	8	-12	44	5	8	-2
2000	9	1	9	9	-2	18	7	4	3
2001	10	7	17	17	-1	31	29	0	28
2002	12	14	26	26	-4	55	24	4	19
2003	9	7	16	16	-13	42	12	13	-1
2004	9	2	11	11	-12	25	5	na	na

a. NRAs including assistance to nontradables and non-product specific assistance.

b. NRAs including products specific input subsidies.

c. The Relative Rate of Assistance (RRA) is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{nonag}}^t) - 1]$ , where  $\text{NRA}_{\text{ag}}^t$  and  $\text{NRA}_{\text{nonag}}^t$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

d. NRAs to nonagriculture are not estimated, but based on authors' assumptions

Appendix Table 2 (continued): Annual distortion estimates, **India**, 1965 to 2004  
(c) Value shares of primary production of covered<sup>a</sup> and non-covered products,  
(percent)

	Chi ckp ea	Cott on	Fru it&v eg	Gro und nut	Mai ze	Mil k	Rap eseed	Ric e	Sor ghu m	Soy bea n	Sug ar	Sun flo wer	Wh eat	No n- cov
1965	3	3	15	4	2	na	1	21	3	na	2	na	4	43
1966	2	3	13	3	2	na	1	22	3	na	2	na	4	45
1967	3	3	13	3	2	na	1	28	3	na	1	na	6	39
1968	2	3	12	3	1	na	1	30	3	na	1	na	5	39
1969	2	3	16	4	1	na	1	26	2	na	2	na	6	38
1970	3	2	15	5	2	na	1	24	3	na	2	na	7	37
1971	3	3	16	5	2	na	1	22	2	na	2	na	8	36
1972	3	3	18	4	1	na	1	19	2	na	2	na	7	38
1973	2	2	13	5	1	na	1	24	2	0	3	na	5	40
1974	2	3	9	3	1	na	1	32	2	0	3	na	5	39
1975	2	2	8	3	2	4	1	31	2	0	7	0	6	32
1976	2	3	13	4	2	5	1	23	3	0	3	0	8	33
1977	2	4	13	5	1	5	1	25	3	0	3	0	7	31
1978	2	3	12	4	1	5	1	29	2	0	2	0	8	30
1979	1	4	14	4	1	5	1	21	3	0	3	0	8	34
1980	2	3	12	3	1	6	1	25	2	0	3	0	7	35
1981	2	3	11	3	1	7	1	28	2	0	4	0	6	32
1982	2	3	14	2	1	7	1	20	2	0	4	0	9	34
1983	2	3	14	4	1	6	1	20	3	0	3	0	9	34
1984	2	4	16	3	2	6	2	19	2	0	2	0	8	33
1985	3	3	19	2	1	7	1	19	2	0	2	0	9	31
1986	2	2	22	2	2	7	1	18	1	0	2	0	9	32
1987	2	3	20	2	1	8	1	15	2	1	3	0	8	34
1988	2	2	15	3	1	9	1	19	2	1	3	0	6	33
1989	2	3	14	3	1	12	1	19	2	1	4	0	7	31
1990	2	3	15	3	1	9	1	20	2	1	5	1	6	30
1991	1	3	15	2	1	11	1	19	1	1	4	0	6	32
1992	1	2	17	3	1	12	1	18	1	1	4	0	6	32
1993	2	3	16	3	1	13	1	18	2	1	3	0	6	30
1994	2	3	16	3	1	14	2	19	1	2	3	1	7	27
1995	1	3	17	2	1	16	2	14	1	1	5	0	7	29
1996	1	3	15	2	1	13	2	19	1	2	4	0	7	30
1997	2	3	21	2	1	14	1	19	1	2	4	0	6	26
1998	2	3	20	3	1	15	1	17	1	1	3	0	6	27
1999	1	2	22	1	1	13	1	18	1	1	3	0	7	29
2000	1	2	22	1	1	18	1	13	1	1	4	0	6	29
2001	2	2	20	2	1	16	1	14	1	1	5	0	7	29
2002	1	1	23	1	1	16	1	11	1	1	4	0	7	32
2003	2	2	23	2	1	15	1	11	1	2	3	0	6	31
2004	1	2	22	2	1	17	1	10	1	2	2	0	6	31

<sup>a</sup> At farmgate undistorted prices

Appendix Table 2 (continued): Annual distortion estimates, **India**, 1965 to 2004:  
(d) Trade status<sup>a</sup> of covered products

	Chi ckp ea	Cott on	Fru it&v eg	Gro und nut	Mai ze	Mil k	Rap eseed	Ric e	Sor ghu m	Soy bea n	Sug ar	Sun flo wer	Wh eat
1965	M	M	H	M	M	na	M	H	M	na	M	na	M
1966	M	M	H	M	M	na	M	X	M	na	M	na	M
1967	M	M	H	M	M	na	M	X	M	na	M	na	M
1968	H	H	H	M	M	na	M	X	M	na	M	na	M
1969	M	M	H	M	M	na	M	X	M	na	M	na	M
1970	H	M	H	H	M	na	M	X	M	na	M	na	M
1971	H	M	H	H	M	na	M	H	M	na	M	na	M
1972	H	M	H	M	M	na	M	H	M	na	M	na	M
1973	H	M	H	H	M	na	H	X	M	H	H	na	H
1974	M	X	H	H	M	na	M	X	M	H	X	na	H
1975	H	H	H	X	X	M	H	X	M	X	X	H	H
1976	H	M	H	X	H	M	H	X	H	X	X	H	X
1977	H	H	H	X	M	M	M	X	M	X	M	H	M
1978	H	M	H	X	M	M	M	X	M	X	M	H	H
1979	H	H	H	H	H	M	M	X	M	X	M	H	H
1980	M	M	H	H	H	M	M	X	H	H	X	M	H
1981	M	X	H	M	H	M	M	X	M	H	X	M	X
1982	H	M	H	M	M	M	M	X	M	H	M	M	H
1983	H	M	H	M	M	M	M	X	M	X	M	H	H
1984	H	X	H	M	X	M	M	X	H	X	M	H	H
1985	M	X	H	M	H	M	M	H	M	H	M	M	H
1986	M	M	H	M	M	M	M	H	M	M	M	M	H
1987	H	M	H	M	M	M	M	H	M	M	M	M	H
1988	M	M	H	M	M	M	M	X	M	H	M	H	H
1989	M	M	H	M	X	M	M	X	M	H	H	M	X
1990	M	H	H	M	H	M	M	X	H	H	X	M	H
1991	H	X	X	M	M	M	M	X	H	M	H	M	X
1992	H	X	X	H	X	M	M	X	X	H	H	H	X
1993	H	M	X	H	X	M	M	X	X	X	H	H	X
1994	H	M	X	H	H	M	M	X	M	H	H	M	X
1995	H	X	X	H	H	M	M	X	X	H	X	H	X
1996	H	X	X	H	X	M	M	X	H	H	H	H	X
1997	M	H	X	H	X	M	M	X	H	X	H	H	H
1998	H	H	X	H	X	M	M	X	M	X	M	H	H
1999	H	H	X	H	H	M	M	X	M	X	M	H	H
2000	H	H	X	H	H	M	M	X	H	H	M	H	H
2001	M	X	H	H	H	M	M	H	H	H	H	H	H
2002	H	X	X	M	H	M	M	H	H	H	M	H	H
2003	H	H	X	M	H	M	M	H	H	X	M	H	H
2004	H	H	X	H	H	M	M	H	M	X	M	H	H

<sup>a</sup> Exportable (X), import-competing (M) and nontradables (H).

Source: Anderson and Valenzuela (2008), based on Pursell, Gulati and Gupta (2007)

Appendix Table 3: Annual distortion estimates, **Pakistan**, 1962 to 2005(a) Nominal rates of assistance to covered products  
(percent)

	Cotton	Maize	Milk	Rice	Sugar	Wheat	All covered
1962	-22	-17	na	-52	193	-7	7
1963	-17	-16	na	-42	191	-16	6
1964	-18	-27	na	-45	27	-17	-16
1965	-3	-14	63	-42	84	6	15
1966	-19	-26	63	-42	266	-11	17
1967	-24	-4	60	-53	228	31	24
1968	-19	6	81	-53	296	18	22
1969	-23	-11	85	-31	296	12	29
1970	-11	-11	140	-14	199	19	45
1971	9	-21	143	2	140	19	47
1972	1	19	241	6	192	7	42
1973	-8	-41	26	-62	11	-69	-48
1974	-22	-44	70	-68	25	-57	-38
1975	-2	-11	67	-59	-35	-14	-19
1976	-8	-24	18	-46	-18	-13	-15
1977	-40	-32	38	-20	26	-26	-11
1978	2	-8	43	-36	92	-23	-4
1979	22	9	108	-44	102	-29	-11
1980	-8	-14	59	-48	63	-36	-20
1981	-17	-19	68	-46	-14	-30	-22
1982	32	18	47	-34	61	-2	7
1983	-5	5	14	-34	123	-21	-8
1984	14	-20	49	-34	129	-23	-4
1985	-20	-20	46	-42	178	-18	-6
1986	4	-22	43	-51	155	-15	-5
1987	24	-10	45	-40	115	-24	-1
1988	-18	43	78	-40	124	-18	0
1989	-20	14	59	-47	45	-33	-16
1990	-43	-23	15	-46	21	-46	-32
1991	-31	-9	22	-9	21	-26	-13
1992	-17	15	22	-5	78	-17	-2
1993	-1	11	44	3	85	-23	0
1994	-8	-6	24	-3	56	-23	-4
1995	-18	3	25	1	33	-19	-5
1996	-13	2	24	2	43	-32	-7
1997	-6	-21	1	-2	75	-35	-14
1998	-4	0	9	9	51	-13	1
1999	1	7	25	-1	70	-2	12
2000	17	8	26	-15	145	9	17
2001	5	-15	14	-11	107	-15	1
2002	18	-17	4	-13	62	-27	-7
2003	-2	-12	44	-13	82	-29	-2
2004	3	-15	18	-18	51	-13	-1
2005	0	-13	13	-21	73	-9	-2

Appendix Table 3 (continued): Annual distortion estimates, **Pakistan**, 1962 to 2005  
(b) Nominal and relative rates of assistance to all<sup>a</sup> agricultural products, to exportable<sup>b</sup> and import-competing<sup>b</sup> agricultural industries, and relative<sup>c</sup> to non-agricultural industries  
(percent)

	Total ag NRA				Ag tradables NRA			Non-ag tradables	
	Covered products		Non-covered products	All products (incl NPS)	Export-ables	Import-competing	All		
	Inputs	Outputs							
1962	-4	11	0	5	-36	20	7	164	-59
1963	-5	11	0	4	-27	15	6	175	-61
1964	-4	-13	0	-11	-36	-8	-16	185	-71
1965	-1	17	0	11	-30	31	15	227	-65
1966	-1	18	0	12	-33	38	17	199	-61
1967	-2	26	0	17	-43	53	24	214	-61
1968	-5	28	0	16	-43	48	22	232	-63
1969	-1	31	0	22	-28	55	29	250	-63
1970	-2	47	0	33	-13	64	45	236	-57
1971	-6	53	0	35	5	59	47	261	-59
1972	-13	54	0	30	3	56	42	153	-44
1973	5	-54	0	-36	-43	-49	-48	51	-66
1974	7	-45	0	-29	-53	-33	-38	33	-54
1975	7	-26	0	-14	-46	-8	-19	25	-35
1976	5	-20	0	-11	-35	-9	-15	44	-41
1977	2	-13	0	-8	-29	-6	-11	53	-42
1978	3	-7	0	-3	-25	3	-4	47	-35
1979	5	-16	0	-7	-32	-2	-11	51	-41
1980	4	-24	0	-14	-37	-14	-20	55	-49
1981	5	-27	0	-15	-38	-16	-22	55	-50
1982	4	3	0	5	-20	18	7	45	-26
1983	2	-10	0	-5	-26	-1	-8	41	-35
1984	2	-5	0	-2	-24	4	-4	46	-34
1985	4	-10	0	-4	-35	6	-6	45	-35
1986	3	-8	0	-3	-35	7	-5	50	-37
1987	2	-4	0	-1	-22	6	-1	46	-32
1988	3	-3	0	0	-31	16	0	41	-30
1989	3	-19	0	-11	-37	-8	-16	44	-42
1990	2	-34	0	-22	-45	-28	-32	48	-54
1991	2	-15	0	-9	-22	-10	-13	41	-38
1992	3	-5	0	-1	-12	2	-2	38	-29
1993	2	-2	0	0	1	0	0	34	-25
1994	2	-6	0	-3	-5	-4	-4	35	-29
1995	2	-7	0	-3	-12	-3	-5	34	-29
1996	3	-10	0	-5	-7	-7	-7	32	-29
1997	2	-16	0	-10	-4	-16	-14	26	-32
1998	2	-1	0	1	2	1	1	24	-19
1999	1	12	0	9	0	16	12	19	-5
2000	1	16	0	12	-5	23	17	17	0
2001	2	-1	0	1	-3	2	1	15	-12
2002	1	-9	0	-5	-1	-9	-7	11	-16
2003	1	-3	0	-2	-9	0	-2	15	-15
2004	1	-2	0	-1	-10	2	-1	15	-14
2005	2	-4	0	-1	-14	2	-2	14	-14

a. NRAs including assistance to nontradables and non-product specific assistance.

b. NRAs including products specific input subsidies.

c. The Relative Rate of Assistance (RRA) is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{nonag}}^t) - 1]$ , where  $\text{NRA}_{\text{ag}}^t$  and  $\text{NRA}_{\text{nonag}}^t$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Appendix Table 3 (continued): Annual distortion estimates, **Pakistan**, 1962 to 2005  
(c) Value shares of primary production of covered<sup>a</sup> and non-covered products,  
(percent)

	Cotton	Maize	Milk	Rice	Sugar	Wheat	Non-covered
1962	9	4	na	8	7	42	31
1963	8	4	na	6	8	43	31
1964	7	4	na	14	11	34	31
1965	6	3	12	12	8	28	31
1966	7	3	14	12	5	27	31
1967	7	5	12	14	4	27	30
1968	6	3	10	14	3	33	30
1969	8	3	12	15	5	31	27
1970	8	3	10	11	7	35	26
1971	8	4	12	9	9	34	26
1972	10	3	7	9	5	39	27
1973	4	2	7	8	6	47	25
1974	7	2	6	14	6	40	26
1975	4	2	7	16	13	30	27
1976	4	2	11	12	13	30	28
1977	7	3	11	10	9	34	27
1978	5	2	10	13	6	35	29
1979	4	2	5	16	4	39	30
1980	5	2	6	14	5	38	30
1981	5	2	5	13	12	32	31
1982	4	2	8	16	8	30	31
1983	5	2	9	13	4	34	31
1984	4	2	8	14	5	33	33
1985	6	2	9	14	3	33	33
1986	5	2	9	14	3	33	33
1987	5	2	10	13	6	32	32
1988	10	2	9	14	4	31	30
1989	7	2	8	12	5	34	32
1990	9	2	9	10	5	33	33
1991	11	2	11	7	6	33	29
1992	11	2	11	6	4	31	35
1993	7	2	10	6	4	35	36
1994	7	2	12	7	5	31	36
1995	11	2	10	5	5	30	36
1996	9	2	16	5	4	29	36
1997	7	2	19	6	3	32	30
1998	6	2	19	5	6	31	30
1999	7	2	20	9	6	28	29
2000	5	2	20	11	3	31	27
2001	7	2	19	7	3	33	28
2002	5	2	19	8	5	32	29
2003	6	2	14	10	5	34	30
2004	7	2	16	11	5	30	30
2005	6	3	16	11	3	31	30

<sup>a</sup> At farmgate undistorted prices

Appendix Table 3 (continued): Annual distortion estimates, **Pakistan**, 1962 to 2005:  
(d) Trade status<sup>a</sup> of covered products

	Cotton	Maize	Milk	Rice	Sugar	Wheat
1962	X	M	na	X	M	M
1963	X	M	na	X	M	M
1964	X	M	na	X	M	M
1965	X	M	M	X	M	M
1966	X	M	M	X	M	M
1967	X	M	M	X	M	M
1968	X	M	M	X	M	M
1969	X	M	M	X	M	M
1970	X	M	M	X	M	M
1971	X	M	M	X	M	M
1972	X	M	M	X	M	M
1973	X	M	M	X	M	M
1974	X	M	M	X	M	M
1975	X	M	M	X	M	M
1976	X	M	M	X	M	M
1977	X	M	M	X	M	M
1978	X	M	M	X	M	M
1979	X	M	M	X	M	M
1980	X	M	M	X	M	M
1981	X	M	M	X	M	M
1982	X	M	M	X	M	M
1983	X	M	M	X	M	M
1984	X	M	M	X	M	M
1985	X	M	M	X	M	M
1986	X	M	M	X	M	M
1987	X	M	M	X	M	M
1988	X	M	M	X	M	M
1989	X	M	M	X	M	M
1990	X	M	M	X	M	M
1991	X	M	M	X	M	M
1992	X	M	M	X	M	M
1993	X	M	M	X	M	M
1994	X	M	M	X	M	M
1995	X	M	M	X	M	M
1996	X	M	M	X	M	M
1997	X	M	M	X	M	M
1998	X	M	M	X	M	M
1999	X	M	M	X	M	M
2000	X	M	M	X	M	M
2001	X	M	M	X	M	M
2002	X	M	M	X	M	M
2003	X	M	M	X	M	M
2004	X	M	M	X	M	M
2005	X	M	M	X	M	M

<sup>a</sup> Exportable (X), import-competing (M) and nontradables (H).

Source: Anderson and Valenzuela (2008), based on Dorosh and Salem (2007)

Appendix Table 4: Annual distortion estimates, **Sri Lanka**, 1955 to 2004

## (a) Nominal rates of assistance to covered products (percent)

	Chillies	Coconut	Onion	Potato	Rice	Rubber	Tea	All covered
1955	na	-35	na	na	42	-18.0	-23	-14
1956	na	-24	na	na	51	-3.6	-18	-8
1957	na	-28	na	na	70	-19.0	-23	-10
1958	na	-29	na	na	95	-24.9	-25	-9
1959	na	-28	na	na	54	-13.5	-22	-11
1960	na	-32	na	na	42	-38.5	-32	-21
1961	na	-37	na	na	32	-45.6	-35	-26
1962	na	-23	na	na	-7	-53	-40	-31
1963	na	-26	na	na	4	-59	-44	-34
1964	na	-30	na	na	-11	-62	-46	-38
1965	na	-31	na	na	-16	-59	-43	-38
1966	na	-18	na	na	-23	-70	-51	-44
1967	na	-19	na	na	-9	-57	-44	-32
1968	na	-34	na	na	1	-25	-28	-20
1969	na	-23	na	na	18	-34	-30	-15
1970	na	-22	na	na	15	-48	-36	-19
1971	na	-48	na	na	7	-60	-41	-7
1972	na	-33	na	na	3	-56	-44	-31
1973	na	-26	na	na	42	-45	-30	-10
1974	na	-34	na	na	-22	-72	-33	-35
1975	na	-30	na	na	-12	-61	-39	-31
1976	na	-4	na	91	-16	-70	-40	-35
1977	na	-37	na	23	38	-38	-15	-11
1978	36	-53	-36	150	-18	-61	-45	-38
1979	69	-58	13	46	-29	-67	-48	-45
1980	52	-52	-9	-41	-12	-55	-36	-33
1981	36	-25	97	164	-4	-53	-35	-18
1982	48	-9	16	25	-1	-48	-30	-12
1983	35	1	11	28	-10	-48	-26	-15
1984	-5	-13	28	40	-2	-54	-25	-17
1985	22	-14	51	70	8	-30	-30	-7
1986	0	26	59	80	23	-31	-25	5
1987	-22	25	-62	-39	7	-30	-21	-8
1988	30	-21	-87	14	-29	-54	-33	-33
1989	5	-42	-25	38	-10	-43	-20	-20
1990	41	-45	-47	67	4	-46	-25	-14
1991	47	-33	3	178	-1	-40	-28	-8
1992	32	-34	-42	146	8	-15	-5	-5
1993	73	-26	68	144	18	-4	-2	9
1994	118	-35	236	253	14	-4	-2	10
1995	102	-42	61	177	29	-5	-2	10
1996	59	-30	86	66	15	-7	-2	0
1997	74	10	65	83	22	-7	-1	13
1998	83	35	108	149	6	-3	-1	16
1999	67	20	78	150	23	0	-2	18
2000	71	25	65	160	3	0	-1	11
2001	81	50	78	225	7	0	-2	19
2002	63	19	37	181	23	0	-1	17
2003	54	1	34	257	-5	0	-1	2
2004	na	-10	na	na	-9	-1	-1	-6

Appendix Table 4 (continued): Annual distortion estimates, **Sri Lanka**, 1955 to 2004  
(b) Nominal and relative rates of assistance to all<sup>a</sup> agricultural products, to exportable<sup>b</sup> and import-competing<sup>b</sup> agricultural industries, and relative<sup>c</sup> to non-agricultural industries  
(percent)

	Total ag NRA				Ag tradables NRA			Non-ag tradables	
	Covered products		Non-covered products	All products (incl NPS)	Exportables	Import-competing	All		
	Inputs	Outputs							
1955	0	-14	6	-7	-25	42	-8	105	-55
1956	0	-8	12	-1	-16	51	-1	105	-52
1957	0	-10	16	-1	-23	70	-2	105	-52
1958	0	-9	23	2	-26	95	2	105	-50
1959	0	-11	10	-4	-23	54	-4	104	-53
1960	0	-21	3	-13	-34	42	-14	103	-58
1961	0	-26	-2	-18	-38	32	-20	114	-63
1962	0	-31	-15	-26	-39	-7	-29	130	-69
1963	0	-34	-13	-27	-44	4	-30	135	-70
1964	0	-38	-19	-31	-46	-11	-36	142	-73
1965	0	-38	-20	-32	-43	-16	-36	158	-75
1966	0	-44	-24	-37	-50	-23	-42	172	-79
1967	0	-32	-17	-26	-41	-9	-30	165	-74
1968	0	-20	-10	-17	-30	1	-19	124	-64
1969	0	-15	-3	-11	-29	18	-12	73	-50
1970	0	-19	-6	-15	-35	15	-17	77	-53
1971	0	-7	-14	-9	-48	7	-11	93	-54
1972	0	-31	-14	-24	-44	3	-28	93	-63
1973	0	-10	3	-4	-34	42	-5	52	-38
1974	0	-35	-22	-29	-45	-22	-34	39	-53
1975	0	-31	-18	-25	-43	-12	-30	43	-51
1976	0	-35	-20	-29	-45	-13	-33	65	-60
1977	0	-11	3	-5	-28	37	-7	55	-40
1978	0	-38	-22	-31	-52	-13	-37	51	-58
1979	0	-45	-25	-37	-58	-17	-43	51	-62
1980	0	-33	-19	-26	-48	-8	-32	51	-55
1981	0	-18	-10	-11	-34	5	-17	56	-47
1982	0	-12	-7	-8	-25	4	-12	56	-43
1983	0	-15	-9	-11	-22	-4	-14	56	-45
1984	0	-17	-9	-13	-26	0	-16	68	-50
1985	0	-7	-3	-4	-23	15	-7	68	-44
1986	0	5	4	6	-10	22	5	68	-37
1987	0	-8	-5	-6	-6	-10	-8	53	-40
1988	0	-33	-22	-29	-35	-32	-33	53	-56
1989	0	-20	-13	-17	-33	-5	-20	53	-48
1990	0	-14	-9	-13	-35	7	-14	45	-41
1991	0	-8	-6	-7	-32	15	-8	45	-37
1992	0	-5	-4	-4	-23	12	-5	52	-38
1993	0	9	7	8	-14	34	10	50	-27
1994	0	10	9	10	-18	44	11	43	-23
1995	0	10	9	11	-20	47	11	37	-19
1996	0	0	4	3	-16	29	2	40	-27
1997	0	13	12	14	3	32	14	36	-16
1998	0	16	11	16	13	20	16	35	-14
1999	0	18	14	18	10	32	19	33	-11
2000	0	11	8	11	10	14	11	21	-8
2001	0	19	13	19	17	22	19	23	-3
2002	0	17	13	17	8	32	17	23	-4
2003	0	2	2	4	0	6	3	25	-18
2004	0	-6	-5	-4	-4	-9	-6	22	-23

a. NRAs including assistance to nontradables and non-product specific assistance.

b. NRAs including products specific input subsidies.

c. The Relative Rate of Assistance (RRA) is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{nonag}}^t) - 1]$ , where  $\text{NRA}_{\text{ag}}^t$  and  $\text{NRA}_{\text{nonag}}^t$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Appendix Table 4 (continued): Annual distortion estimates, **Sri Lanka**, 1955 to 2004  
(c) Value shares of primary production of covered<sup>a</sup> and non-covered products,  
(percent)

	Chillies	Coconut	Onion	Potato	Rice	Rubber	Tea	Non-covered
1955	na	15	na	na	11	12	27	34
1956	na	16	na	na	9	13	28	34
1957	na	16	na	na	9	13	27	34
1958	na	18	na	na	9	12	27	34
1959	na	21	na	na	10	11	24	34
1960	na	15	na	na	11	14	26	34
1961	na	15	na	na	11	12	28	34
1962	na	12	na	na	15	12	26	34
1963	na	12	na	na	14	13	27	34
1964	na	14	na	na	15	13	25	34
1965	na	16	na	na	12	13	25	34
1966	na	11	na	na	14	18	23	34
1967	na	11	na	na	18	13	21	36
1968	na	20	na	na	21	8	19	32
1969	na	17	na	na	20	12	18	32
1970	na	16	na	na	21	13	18	31
1971	na	5	na	na	48	4	7	36
1972	na	12	na	na	17	11	22	38
1973	na	12	na	na	19	13	16	39
1974	na	14	na	na	31	11	12	33
1975	na	10	na	na	23	10	15	43
1976	na	9	na	1	20	17	16	37
1977	na	21	na	1	16	8	21	33
1978	2	18	2	0	21	9	16	32
1979	2	19	1	1	18	14	11	35
1980	2	19	1	1	18	10	11	37
1981	2	16	1	1	23	8	12	38
1982	2	14	1	1	23	7	13	38
1983	2	12	1	1	21	8	16	38
1984	3	16	1	1	16	8	20	36
1985	6	16	1	1	20	7	17	32
1986	8	11	1	2	21	9	15	34
1987	6	12	2	4	18	7	15	35
1988	4	10	7	2	22	9	13	32
1989	6	13	1	2	23	7	15	34
1990	5	11	3	1	24	6	18	31
1991	7	13	1	1	24	5	16	33
1992	6	18	4	1	24	4	9	34
1993	5	15	1	1	23	4	13	37
1994	4	16	1	1	21	6	12	39
1995	4	15	1	1	21	7	11	40
1996	4	18	1	1	15	6	14	41
1997	2	19	1	1	16	5	17	40
1998	3	16	1	0	20	4	19	38
1999	3	20	2	0	22	3	16	34
2000	2	15	1	0	22	3	19	36
2001	2	14	1	1	21	3	21	37
2002	2	17	1	1	20	4	19	36
2003	2	14	1	1	23	5	18	36
2004	na	16	na	na	22	6	21	36

<sup>a</sup> At farmgate undistorted prices

Appendix Table 4 (continued): Annual distortion estimates, **Sri Lanka**, 1955 to 2004  
(d) Trade status<sup>a</sup> of covered products

	Chillies	Coconut	Onion	Potato	Rice	Rubber	Tea
1955	na	X	na	na	M	X	X
1956	na	X	na	na	M	X	X
1957	na	X	na	na	M	X	X
1958	na	X	na	na	M	X	X
1959	na	X	na	na	M	X	X
1960	na	X	na	na	M	X	X
1961	na	X	na	na	M	X	X
1962	na	X	na	na	M	X	X
1963	na	X	na	na	M	X	X
1964	na	X	na	na	M	X	X
1965	na	X	na	na	M	X	X
1966	na	X	na	na	M	X	X
1967	na	X	na	na	M	X	X
1968	na	X	na	na	M	X	X
1969	na	X	na	na	M	X	X
1970	na	X	na	na	M	X	X
1971	na	X	na	na	M	X	X
1972	na	X	na	na	M	X	X
1973	na	X	na	na	M	X	X
1974	na	X	na	na	M	X	X
1975	na	X	na	na	M	X	X
1976	na	X	na	M	M	X	X
1977	na	X	na	M	M	X	X
1978	M	X	M	M	M	X	X
1979	M	X	M	M	M	X	X
1980	M	X	M	M	M	X	X
1981	M	X	M	M	M	X	X
1982	M	X	M	M	M	X	X
1983	M	X	M	M	M	X	X
1984	M	X	M	M	M	X	X
1985	M	X	M	M	M	X	X
1986	M	X	M	M	M	X	X
1987	M	X	M	M	M	X	X
1988	M	X	M	M	M	X	X
1989	M	X	M	M	M	X	X
1990	M	X	M	M	M	X	X
1991	M	X	M	M	M	X	X
1992	M	X	M	M	M	X	X
1993	M	X	M	M	M	X	X
1994	M	X	M	M	M	X	X
1995	M	X	M	M	M	X	X
1996	M	X	M	M	M	X	X
1997	M	X	M	M	M	X	X
1998	M	X	M	M	M	X	X
1999	M	X	M	M	M	X	X
2000	M	X	M	M	M	X	X
2001	M	X	M	M	M	X	X
2002	M	X	M	M	M	X	X
2003	M	X	M	M	M	X	X
2004	na	X	na	na	M	X	X

<sup>a</sup> Exportable (X), import-competing (M) and nontradables (H).

Source: Anderson and Valenzuela (2008), based on Bandara and Jayasuriya (2007)

Appendix Table 5: Shares of the global value of production and consumption of key covered agricultural products, South Asian economies<sup>a</sup>, 2000-04 (percent)

		Bangladesh	India	Pakistan	Sri Lanka	World
<b>Grains</b>	<b>Q</b>	<b>1.6</b>	<b>8.2</b>	<b>1.7</b>	<b>0.1</b>	<b>100</b>
	<b>C</b>	<b>1.8</b>	<b>10.0</b>	<b>1.6</b>	<b>0.1</b>	<b>100</b>
Rice	Q	5.2	15.2	1.2	0.5	100
	C	5.2	18.3	0.7	0.5	100
Wheat	Q	0.4	9.5	4.8		100
	C	0.8	12.6	4.7		100
Maize	Q		2.0	0.3		100
	C		2.9	0.5		100
Sorghum	Q		9.5			100
	C		14.1			100
Chickpea	Q		61.2			100
	C		na			100
<b>Oilseeds</b>	<b>Q</b>		<b>6.5</b>			<b>100</b>
	<b>C</b>		<b>8.5</b>			<b>100</b>
Soybean	Q		4.2			100
	C		5.0			100
Groundnut	Q		17.2			100
	C		17.9			100
Rapeseed	Q		12.6			100
	C		12.6			100
Sunflower	Q		4.7			100
	C		5.2			100
<b>Tropical crops</b>	<b>Q</b>	<b>0.2</b>	<b>8.5</b>	<b>1.6</b>	<b>1.0</b>	<b>100</b>
	<b>C</b>	<b>0.2</b>	<b>8.3</b>	<b>1.6</b>	<b>0.4</b>	<b>100</b>
Sugar	Q	0.4	17.1	2.1		100
	C	0.5	16.9	2.4		100
Cotton	Q		12.1	4.0		100
	C		13.1	3.6		100
Coconut	Q				3.6	100
	C				2.9	100
Rubber	Q				1.2	100
	C				0.8	100
Tea	Q	1.3			6.3	100
	C	1.4			0.4	100
<b>Livestock products</b>						
Milk	Q		16.4	1.8		100
	C		19.2	2.1		100
<b>Total of above products</b>	<b>Q</b>	<b>0.5</b>	<b>5.3</b>	<b>0.8</b>	<b>0.1</b>	<b>100</b>
	<b>C</b>	<b>0.6</b>	<b>6.9</b>	<b>0.9</b>	<b>0.1</b>	<b>100</b>
<b>Production only</b>						100
All covered	Q	0.6	8.5	0.9	0.1	100
Non-covered	Q	0.5	7.9	0.8	0.2	100
All agriculture	Q	0.6	8.3	0.8	0.1	100

Source: Authors' calculations using Project data and FAO Production and Commodity Balance Data.  
a. There are no Taiwan data in the FAO database.

Appendix Table 6: Shares of the global value of exports and imports of key covered agricultural products, South Asian economies<sup>a</sup>, 2000-03

		(percent)				
		Bangladesh	India	Pakistan	Srilanka	World
<b>Grains</b>	<b>X</b>	<b>0.0</b>	<b>3.4</b>	<b>0.2</b>	<b>0.0</b>	<b>100.0</b>
	<b>M</b>	<b>0.9</b>	<b>0.2</b>	<b>0.2</b>	<b>0.0</b>	<b>100.0</b>
Rice	X	0.0	12.7	0.0	0.0	100.0
	M	1.6	0.0	0.0	0.1	100.0
Wheat	X	0.0	2.1	0.4		100.0
	M	1.4	0.0	0.4		100.0
Maize	X		0.3	0.0		100.0
	M		0.0	0.1		100.0
Sorghum	X		0.1			100.0
	M		0.0			100.0
Chickpea	X		0.2			100.0
	M		23.5			100.0
<b>Oilseeds</b>	<b>X</b>		<b>1.2</b>			<b>100.0</b>
	<b>M</b>		<b>0.2</b>			<b>100.0</b>
Soybean	X		2.4			100.0
	M		0.0			100.0
Groundnut	X		8.3			100.0
	M		0.0			100.0
Rapeseed	X		0.1			100.0
	M		0.0			100.0
Sunflower	X		0.1			100.0
	M		3.2			100.0
		Bangladesh	India	Pakistan	Srilanka	World
<b>Tropical crops</b>	<b>X</b>	<b>0.0</b>	<b>1.2</b>	<b>0.2</b>	<b>2.7</b>	<b>100.0</b>
	<b>M</b>	<b>0.3</b>	<b>0.6</b>	<b>0.8</b>	<b>0.0</b>	<b>100.0</b>
Sugar	X	0.0	2.8	0.0		100.0
	M	0.8	0.1	1.3		100.0
Cotton	X		0.7	1.0		100.0
	M		4.4	2.4		100.0
Coconut	X				16.9	100.0
	M				0.0	100.0
Rubber	X				0.7	100.0
	M				0.1	100.0
Tea	X	0.3			23.9	100.0
	M	0.0			0.3	100.0
<b>Livestock products</b>	<b>X</b>		<b>0.1</b>	<b>0.0</b>		<b>100.0</b>
	<b>M</b>		<b>0.0</b>	<b>0.0</b>		<b>100.0</b>
Milk	X		0.2	0.0		100.0
	M		0.1	0.0		100.0
<b>Total of above</b>	<b>X</b>	<b>0.0</b>	<b>1.1</b>	<b>0.1</b>	<b>0.5</b>	<b>100.0</b>
	<b>M</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>0.0</b>	<b>100.0</b>
<b>All exports</b>	<b>X</b>	<b>0.0</b>	<b>1.2</b>	<b>0.2</b>	<b>0.2</b>	<b>100.0</b>
	<b>M</b>	<b>0.3</b>	<b>0.8</b>	<b>0.4</b>	<b>0.2</b>	<b>100.0</b>

Source: Authors' derivation using production, trade value data at FAOSTAT.

a. There are no Taiwan data in the FAO database.

