

INDIA

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This chapter analyzes the impacts on price incentives in India's agricultural sector that have resulted from government price, trade, and exchange rate policies. Previous studies have established that, from the 1970s to 1995, the incentive system strongly favored manufacturing and services over the principal agricultural crops, although the extent of the antiagricultural bias had diminished considerably by the mid-1990s (Pursell 1999).¹ Our study updates these earlier estimates to 2005 and incorporates estimates for agriculture going back to 1965. In addition, we extend the previous work by considering policies affecting the incentives for the production of fresh fruits and vegetables and for dairying, which account for large shares of the rural economy as measured by the respective contributions to gross domestic product (GDP). We also briefly discuss policies affecting food processing.

The chapter is organized as follows. In the next section, we provide overviews of economic growth and structural change in the Indian economy and the evolution of trade policies since independence, including the effects of current government policies on agricultural trade with the country's neighbors in South Asia. In the subsequent section, we discuss the exchange rate and its interaction with trade policies, especially during the massive rupee devaluation of 1985–93. We then offer quantitative evidence on nominal rates of assistance (NRAs) in various agricultural subsectors, including subsidies for electricity and fertilizer inputs. We also estimate the distortions in the incentives for farmers relative to the incentives for

The authors thank the members of the central project team (especially Marianne Kurzweil and Ernesto Valenzuela) for their contributions and technical help with the data spreadsheets from which several of our tables and figures have been generated.

producers of nonagricultural tradables. We use this evidence to show that the initial, notable antiagricultural bias of government policies gradually gave way to a slight bias in favor of agriculture. Finally, we discuss the political economy forces that are likely to influence the direction of government policies, including the possibility that a strong proagricultural bias may emerge as has occurred in more-advanced, densely populated economies in East Asia and elsewhere.

Economic Growth and Structural Change

Agriculture accounted for slightly more than 50 percent of GDP in 1950, but its share is now less than 20 percent.² Most of this decline occurred in crop agriculture. In contrast, the livestock subsector (mainly dairying) grew more rapidly than the rest of the economy. The GDP share of this subsector rose from 2 percent in the early 1980s to 4.4 percent in 2005. Forestry was important after independence, but, in 2003, it provided only around 1 percent of GDP, as did fishing, despite fairly speedy growth over a long period, mainly impelled by fish farm development. Meanwhile, mining's contribution grew from less than 1 percent in the 1950s to 2.8 percent in 2005. The steep decline in agriculture's contribution to the economy since independence has been generated principally by the more rapid growth in the services sector, from barely 30 percent of GDP in 1950 to 63 percent in 2003. The growth of the services sector has been especially brisk since the early 1990s, and it accelerated during the late 1990s and early years of the next decade because of swift advances in information technology and export outsourcing. The share of manufacturing in the economy also increased, but not nearly as quickly as it did in many other developing countries. The share of manufacturing in GDP in 2005 was 16 percent (much lower than in East Asian economies). This compares with 10 percent in 1950, shortly after independence (table 10.1).

The contribution of the rural sector to GDP has declined by almost 70 percent since independence. However, the sector still accounted for around 60 percent of national employment in 2003, and this share had been declining only slowly since the early 1990s (partly because of slow growth in manufacturing employment).

International trade in agricultural products has always been tiny relative to the size of the agricultural sector. In 2005, agricultural imports were equivalent to only 0.8 percent of the value of agricultural production (or 2.1 percent if edible oil imports are included), while exports were 6.4 percent of production. Even during earlier periods, when agriculture represented a major share of total trade (for example, 27 and 44 percent of total imports and exports, respectively, in 1960), imports and exports still only accounted for a little more than 3 percent of agricultural production (table 10.2).

The most important primary agricultural import initially was wheat, followed by cotton and powdered milk. Beginning around the mid-1970s, the need for

Table 10.1. Sectoral Share of GDP and Employment, India, 1950–2005
(percent)

Sector	1950	1960	1970	1980	1990	2000	2003	2004	2005
All agriculture ^a	56.9	46.7	46.1	38.9	31.3	23.4	20.9	18.8	18.3
Livestock	—	—	—	1.9	4.7	5.4	4.6	4.8	4.4
Crops	—	—	—	33.7	23.8	15.8	14.4	12.2	12.1
Forestry and logging	3.0	2.2	2.1	2.5	1.8	1.0	0.9	0.8	0.7
Fishing	0.4	0.5	0.6	0.7	1.0	1.1	1.1	1.0	1.1
Mining and quarrying	0.8	1.1	1.1	1.7	2.7	2.4	2.5	3.0	2.8
Manufacturing	10.6	13.8	13.8	16.3	17.1	15.6	15.2	15.9	16.0
Services	31.8	38.4	39.1	43.1	48.8	53.7	61.3	62.4	62.9
Agriculture's share in employment	—	—	—	—	69	62	60	—	—

Sources: Author computations based on Ministry of Finance, various; CGA Database 2008.
Note: — = no data are available.

a. Agriculture includes crop agriculture, horticulture, livestock activities, inland and ocean fisheries, and forestry activities.

Table 10.2. Profile of Agricultural and Manufacturing Imports and Exports, India, 1960-2005
(percent)

Indicator	1960	1970	1980	1990	2000	2004	2005
<i>Share in total imports</i>							
Primary agricultural, fishing, and forest products	27.2	23.7	3.5	1.9	0.7	0.9	0.8
Edible oils	0.3	2.4	5.6	0.8	2.6	2.2	1.4
Manufactured products	66.1	61.3	42.9	56.9	51.9	46.2	47.1
<i>Share in total exports</i>							
Primary agricultural, fishing, and forest products	44.3	30.7	30.2	17.8	12.8	9.8	9.6
Manufactured products	45.3	53.6	59.2	72.3	77.7	73.0	70.3
<i>Imports as a share of production</i>							
Primary agricultural, fishing, and forest products	3.4	1.7	0.7	0.4	0.3	0.8	0.8
Edible oils	0.0	0.2	1.2	0.2	1.2	1.8	1.3
Manufactured products ^a	9.5	4.2	5.6	6.3	8.6	11.6	13.3
<i>Exports as a share of production</i>							
Primary agricultural, fishing, and forest products	3.2	2.1	3.3	3.2	5.1	5.9	6.4
Manufactured products	3.7	3.4	4.1	6.1	11.4	13.8	14.3

Sources: Author computations based on Ministry of Finance, various; CGA Database 2008.

a. Excludes petroleum, oils, lubricants, and nonmetallic mineral manufactures, which consist mainly of rough diamonds.

these and other agricultural imports were eliminated because of growing domestic production, and, since then, they have accounted for only a small share of total imports even when they were imported during poor crop seasons, for example, in wheat and sugar.

The largest consistent imports of processed food have involved edible oils. Imports of these products expanded rapidly during the 1970s and early 1980s, triggering a major government program to replace the imports through domestic production. For a while, edible oil imports declined, but, despite high tariffs (an 80 percent tariff on palm oil in 2006, for instance), import growth resumed in the 1990s, and, by 2005, imports accounted for about 40 percent of the domestic consumption of these products.

During the 1950s and 1960s, agricultural products represented slightly less than half of the country's total merchandise exports, but the share has steadily declined since then and is now around 10 percent. A diverse range of agricultural products are regularly exported, including fish and fish preparations, oil cakes, cashew kernels, tea, coffee, tobacco, spices, fruits, vegetables, pulses, basmati rice, and, periodically, large quantities of sugar and common rice (more than 4 million tons of rice in 2004/05, for example). Except for cashew kernels, the share of exports in the total domestic production of these individual products is small.

Since the late 1980s, manufactured exports have usually accounted for 70-80 percent of total merchandise exports, compared with 40-50 percent in the 1950s and 1960s. Manufactured exports have also increased in relation to total manufacturing production, especially since the late 1980s, growing about twice as quickly, at 20-30 percent a year, in 2000-05. However, relative to many other developing countries, these exports still constitute a small share of manufacturing sector output (around 15 percent in 2005).

Service sector exports have also been growing rapidly in recent years, at about 25 percent annually. In 2004, net invisible exports represented 4.9 percent of GDP, compared with the negative net balances before 1990. The most dynamic components of this trade are software exports, other exports related to information technology, and the outsourcing of services.

The share of food expenditure in household budgets is high in India, amounting to 54 percent and 42 percent of total per capita consumption expenditure in rural and urban areas, respectively. The shares of food in the budgets of the poorest 10 percent of households is even higher, averaging 62 percent in rural areas and 58 percent in urban areas in 2003. Because of these high shares of food in household budgets (the shares have been declining only slowly), it is not surprising that food prices and food availability are regular news items in the local and national press and other media, and that food prices, especially sudden increases such as in 2008, are highly sensitive politically. One of the most prominent

objectives of the independence movement in India was to establish institutions and policies that would permanently eliminate catastrophic famines, such as those that occurred during the colonial period, and that would also ensure that basic food items would be available to the entire population at affordable prices.

To achieve these food policy goals, the government has intervened in food grain markets since the late 1940s. In 1958, it established the current public distribution system, which sells basic foods at subsidized prices through fair price shops. (There are currently about 460,000 of these shops.) For most of its history, the system has distributed wheat, rice, sugar, and edible oils on the basis of ration cards that entitle the bearers to specified quantities of food items at announced low prices. In June 1997, the system was changed by distinguishing, according to fixed criteria, between below-poverty-line and above-poverty-line buyers. The former group was eligible to benefit from especially low prices, while the latter group was eligible to buy the food items at prices that were slightly below free-market prices. In 2001, edible oils were removed from the system, and, in 2002, the role of sugar was drastically reduced by allowing subsidized sales only to below-poverty-line households. The principal government food subsidy activity today is the sale of rice and wheat through the fair price shops to below-poverty-line households and distribution as part of other antipoverty programs. In 2003, the total government food subsidy was estimated at Rs 258 billion (about US\$5.7 billion, or 0.83 percent of GDP); this subsidy was defined as the Food Corporation of India's total procurement handling and distribution costs, less the subsidized sales value.

Trade and Exchange Rate Policies since Independence

During the second half of the 1800s and until about 1921, the British rulers of India followed free trade policies that imposed few restrictions or taxes on exports or imports.³ These free trade policies began to change in the early 1920s following the collapse of the post-World War I boom, and protective tariffs continued to be introduced during the 1920s and 1930s. Then, in 1940, general controls were imposed on all imports and exports to deal with scarcities in goods, shipping, and foreign exchange and to address wartime priorities. The general rule was that imports would only be allowed if they were essential and could not be supplied by local industries.

After independence in August 1947, the government relaxed wartime import controls by expanding the scope of lists of goods that could be imported without obtaining a license (the open general license) and by raising tariffs to take pressure off the import licensing system. However, the start of the Second Five-Year Plan in 1956 coincided with a severe foreign exchange crisis, and, until 1966, the comprehensive administration of the import licensing system was tight. These foreign

trade policies were an extension of more general economic policies under which the commanding heights of the industrial economy (which excluded farming) were dominated by state enterprises, and the private sector (including agriculture) was subject to extensive controls. Collectively, these controls came to be known as the license *Raj* (the Hindi word for reign or rule).

In June 1966, the rupee was devalued. This was accompanied by a brief episode of liberalization 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 liberalizing initiatives had been reversed and tight import and domestic controls had been reinstated. This remained the situation until the end of the 1970s, when a new phase of slow, partial liberalization commenced.

The slow liberalization trend of the late 1970s and early 1980s included the relaxation of industrial licensing rules, regular additions of intermediate products and capital goods to open general license lists, and tariff increases that succeeded in capturing some of the economic rents inherent in the import licensing system. Liberalization gained momentum during the Rajiv Gandhi government administration (1985–89) when the economic growth rate accelerated above the slow average rate that had characterized the previous 40 years. The boom culminated in a severe foreign exchange crisis in 1991. The government reacted by implementing a sharp devaluation. The devaluation was accompanied by sweeping liberalizing measures that removed many of the key domestic controls over manufacturing, nearly all the import licensing system for intermediate and capital goods, and a key export subsidy program. The initiatives also included a four-year program of tariff reductions. These reductions continued into the 1990s and brought tariffs down far below the extremely high and prohibitive rates of the 1980s (when they averaged more than 100 percent), though the tariffs were still high by international standards.

Domestic policies and trade policies that affected the rural sector were basically untouched by the 1991 reforms. In particular, government enterprises continued to dominate the domestic and international trade in cereals (notably the Food Corporation of India, which periodically imported wheat to meet domestic shortages), and agricultural products remained subject to the import licensing system that applied to all consumer goods. With some important exceptions, import licenses were not issued for agricultural products. The system thus amounted to an import ban on agriculture. The exceptions in agriculture included a few products for which imports had been open even during the most restrictive periods (pulses, for example) and other products, such as cotton and wool, for which unrestricted low-tariff imports of important inputs had been successfully negotiated by influential industrial lobbyists. Edible oils were also

imported on a large scale (despite efforts undertaken to replace the imports through domestic production), first, by state trading firms holding import monopoly rights and, later, by the private sector. However, the edible oil imports were subject to high tariffs.

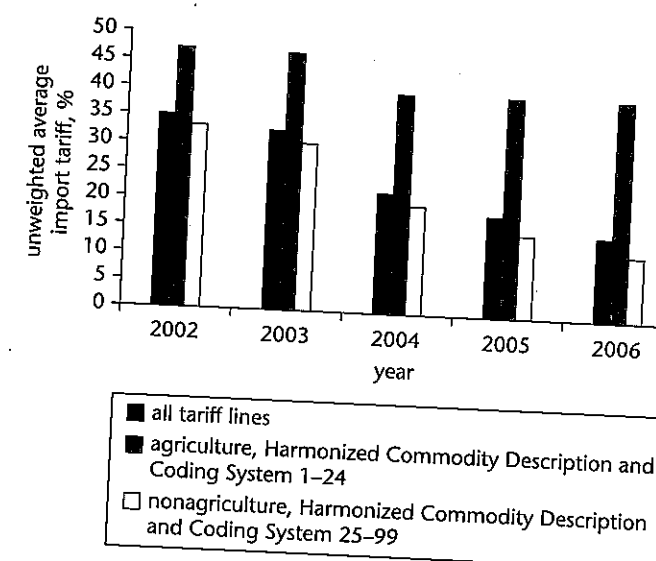
It has been estimated that, in the mid-1990s, five years after the 1991 reforms, about two-thirds of tradable GDP was still protected by explicit nontariff barriers (about 36 percent in manufacturing, 84 percent in agriculture, and 40 percent in mining). During the second half of the 1990s, this situation began to change, in large measure in response to international pressures linked to the Uruguay Round agreements and the negotiations associated with them. Starting in 1998, the general import licensing system began gradually to be dismantled, and, on April 1, 2001, the last 715 of 2,714 tariff lines (including nearly all the agricultural tariff lines) were removed, and the system itself was abolished.

Understandably, after almost 50 years of de facto autarchy, the lifting of these controls generated considerable apprehension over the ability of domestic producers of manufactured consumer goods and agricultural products to compete with imports. A war room was created at the Ministry of Commerce, and a list of 300 sensitive products was drawn up so that imports of these products could be monitored to ensure that prompt action would be taken to preempt or minimize disruptions in local production. More substantively, during and following the Uruguay Round negotiations, the government sought to protect or subsidize domestic producers by marshaling all the techniques not explicitly forbidden by the World Trade Organization agreements. They included techniques of uncertain legality that the government believed might be used without attracting serious complaints from trading partners.⁴

It became apparent soon after the final abandonment of import licensing in April 2001 that the war room psychology had greatly exaggerated the danger represented by rapidly expanding imports. During the next couple of years, existing tariffs and the other measures that had been introduced proved more than adequate in keeping out competing manufacturing and agricultural imports. Eventually, without a formal announcement, the sensitive products lists quietly disappeared from official publications and public discussion. At the same time, manufactured exports entered a new phase of rapid expansion that continued into 2007 (at around 20–25 percent annually). This was supplemented by similarly rapid growth in exports in services. Together with greater capital inflows, these developments helped create a strong balance of payments and historically high foreign exchange reserves, and they were accompanied by brisk economic growth.

Responding to the new confidence that these changes created, the government commenced a program of drastic reductions in industrial tariffs in April 2003 that, over the next four years, lowered the average tariff by approximately

Figure 10.1. Import Tariffs, Agricultural and Nonagricultural Products, India, 2002–06



Source: Author computation based on data in Goyal, various.

Note: 2002/03 (2003) and 2003/04 (2004) include para-tariffs that were abolished in 2004/05 (2005). The averages reflect ad valorem tariffs only. They do not take account of specific components in compound duties.

two-thirds, from over 33 percent to about 12 percent (figure 10.1).⁵ This was followed by another tariff reduction in the 2007 budget. Because of these cuts, India became one of the world's low-protection countries (measured according to average ad valorem industrial tariffs) after having been one of the world's most protected countries.⁶ The average industrial tariffs are now slightly higher than the corresponding average in China and the Republic of Korea and about the same as the average in Sri Lanka, which has traditionally been considered the sole low-protection economy in South Asia. Moreover, because of the top-down reduction process, the industrial tariff structure is uniform. Thus, in 2007, over 80 percent of the industrial tariff lines were at or below the new general maximum of 10 percent; this limited the scope for high effective protection through escalated tariff structures.

However, from the beginning, agriculture and processed foods were not covered by the new tariff reduction program (figure 10.1). In 2006, the unweighted average tariffs protecting these industries (Harmonized Commodity Description

and Coding System, 1-24) were about 40 percent, almost four times the average industrial tariffs and among the highest in the world. Moreover, these tariffs are highly dispersed; about 15 percent of the tariffs are in the 50-100 percent range. These high tariffs have been maintained despite substantial tariff redundancy among most agricultural commodities (see elsewhere below). The domestic prices for many commodities are not only lower than duty-inclusive import prices, but are also frequently lower than duty-exclusive import prices. This special treatment provided through agricultural trade policies reflects the pressure exerted by many farmer and processor interest groups and mediated through and supported by the Ministry of Agriculture.

Regional trade agreements

As a by-product of the country's highly protective agricultural trade policies, the trade in primary and processed agricultural and livestock products between India and its South Asian neighbors has been seriously hindered.⁷ Ironically, the main victim has likely been Indian exports to these countries rather than Indian imports from the region. Indian domestic prices are low, and, even under a free trade regime, the products of neighboring countries would face difficulties competing there. Meanwhile, India's high tariffs and other barriers to imports have reinforced and helped justify domestically the reluctance of other South Asian countries to reduce their own barriers to agricultural trade either multilaterally or as part of regional and bilateral preferential trade arrangements.

Thus, for many years, the South Asian Preferential Trade Agreement had only limited relevance in regional agricultural trade because all agricultural imports to India were subject to that country's discretionary import licensing system. Import licensing was lifted among members of the South Asian Preferential Trade Agreement in 1998, three years before it was finally phased out by this group with respect to the rest of the world. Nonetheless, since then, the combination of high redundant tariffs, low domestic prices for most agricultural products, and the continuing role of state trading enterprises has meant that it is impossible for these countries to compete in the majority of India's domestic markets. Except for Bhutan and Nepal, the government of India has provided few tariff preferences for agricultural products under its bilateral trade agreements, notably, in its bilateral free trade agreement with the government of Sri Lanka. Under the South Asia Free Trade Agreement, most agricultural tariff lines, including the lines for processed foods, are on the government of India's sensitive list of the products for which it has made no commitments.

The reluctance of the government to provide tariff preferences partly reflects a desire to prevent imports from third countries through preference-receiving

countries. Reciprocally, Bangladesh, Pakistan, and Sri Lanka have been unwilling to provide tariff preferences for agricultural products under the South Asian Preferential Trade Agreement and have also placed most agricultural products that they produce on their own South Asia Free Trade Agreement sensitive products lists. This is largely a reaction to the Indian position because, even though these agreements, in principle, involve a number of countries, the potential regional trade that really matters is, in practice, the bilateral trade with India. However, in Bangladesh and Sri Lanka, the reciprocity 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 the more highly protected agricultural industries of these countries, such as sugar, various fresh fruits, vegetables, and a wide range of processed foods in Bangladesh, and, in Sri Lanka, rice, potatoes, and onions.⁸

If it were opened up, India-Pakistan bilateral agricultural trade would probably be more balanced. Recent studies suggest that there is considerable potential for welfare-improving bilateral trade in wheat and sugar. The direction and timing of this trade would vary with weather and other seasonal factors and, compared to trade through the ports with countries outside the South Asia region, would benefit from large transport cost savings, especially trade between the Indian northwest states and Pakistan Punjab. It is also likely that the poultry and other livestock products of Pakistan could be profitably exported to India. However, bilateral trade between India and Pakistan is hostage to the difficult political relationship of the two countries, which is reflected in Pakistan's positive list of products that may be legally imported from India. This list includes almost no agricultural products. Moreover, rules enforced in both countries (with a few minor exceptions) do not allow trade over the land border.

The exchange rate regime and trade policies

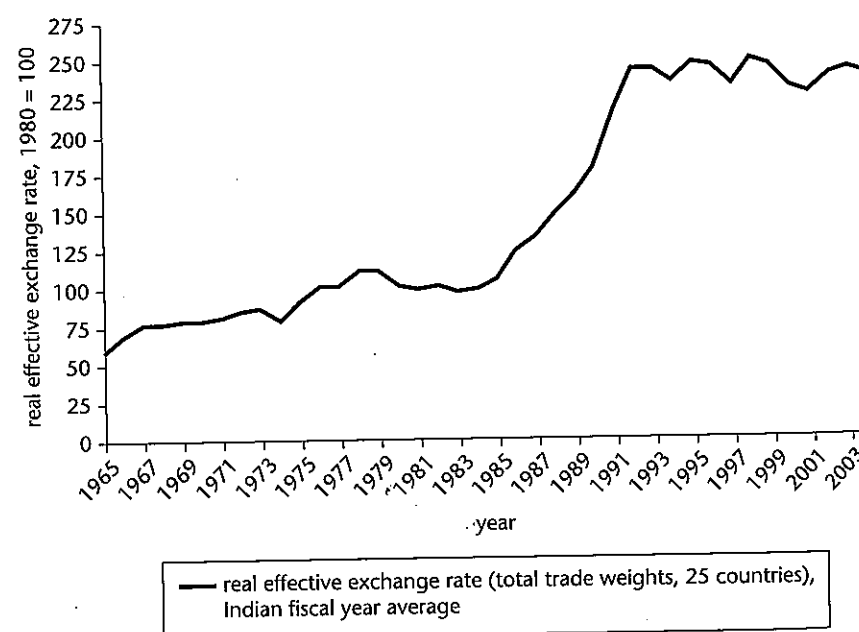
Trade policies must be understood in the context of exchange rate policies.⁹ The rupee was pegged to the pound sterling before independence in 1947, and this continued until September 1975. In June 1966, the fixed rupee-pound rate was devalued by 57.5 percent and by the same proportion to the U.S. dollar, to Rs 7.50. In line with the fixed link with the pound, the rupee-dollar rate floated down slightly between 1966 and 1975. In September 1975, the peg to the pound sterling was removed, and, until 1992, the rate was fixed by the Reserve Bank of India. In 1992, this system was replaced by a managed floating rate, whereby the Reserve Bank of India allowed the rupee to move in relation to a basket of currencies.

A prolonged period of nominal devaluation began in 1982. The devaluation rate was rapid at first. It slowed for three years in the mid-1980s and then accelerated

between 1989 and 1991. This process culminated in a major devaluation to deal with the July 1991 foreign exchange crisis, and the nominal rupee-dollar rate fell by approximately 70 percent between 1991 and 1993. During the next 10 years, the exchange rate was devalued at a modest pace that approximately offset domestic inflation in relation to inflation among India's principal trading partners. From 2003 to mid-2008, the nominal rupee-dollar rate appreciated because of a new export boom and the buildup of large foreign exchange reserves.

The economic significance of the trends in the country's nominal exchange rates becomes clearer if one takes account of the nominal rates in relation to the currencies of India's principal trading partners (not only the U.S. dollar) and of the inflation rate in India relative to the inflation rates in these countries. These effects are systematically captured in real effective exchange rate series. Comprehensive real effective exchange rate indexes are available for India since 1980. Figure 10.2 illustrates an index for this period weighted by India's total trade with 25 countries, and this index has been linked to earlier estimates of the World Bank and others to produce a series starting in 1965. Based on this series, the interaction between India's exchange rate history and the country's trade policies may be

Figure 10.2. Index, Real Effective Exchange Rate, India, 1965–2004



Source: Author calculations based on RBI Database 2008.

Note: Rising numbers indicate devaluation; falling numbers indicate appreciation.

divided into four periods. Details of the changes in the exchange rate and the related changes in sectoral trade policies during these periods are provided below following our discussion of the period from independence to the mid-1960s.

From 1947 to the 1966 devaluation

By 1956, inflation had begun to erode the effects of the devaluation in 1949. The inflation accelerated during the 10 years to the mid-1960s. In effect, this amounted to a substantial real appreciation of the rupee in relation to the rates fixed to the pound sterling and the U.S. dollar. For most of the period from independence to the mid-1960s, agricultural trade policies were characterized by stringent export controls, and, when exports were allowed, by high export taxes that affected, for example, jute and jute products, oil cakes, cotton, tea, and black pepper. Despite these restrictions and taxes, agricultural and mineral products (the latter also subject to export taxes) accounted for about half the foreign exchange earnings from exports, and, because foreign exchange was becoming increasingly scarce after 1956, the export taxes were steadily reduced and almost eliminated prior to the 1966 devaluation. On the import side, agricultural imports by the private sector were effectively banned, and substantial cereal imports, mostly of wheat under the U.S. Public Law 480 food aid program, were managed by the government.

Before and immediately after independence, nearly all imports in manufacturing were subject to discretionary import licensing or were canalized through government monopoly trading organizations. After 1956, import licensing was regularly tightened in response to the steadily worsening foreign exchange situation. Meanwhile, tariffs were increased and had reached high levels by early 1966. These steps caused large, highly variable gaps to appear between the domestic and international prices of manufactured products. The other principal reaction to the increasingly overvalued exchange rate was the government's attempt to offset the resulting antiexport bias by providing substantial subsidies for manufactured exports, mainly by allowing exporters to import otherwise restricted raw materials, components, and machines free of duties; the exporters then could sell in the domestic market for premiums that reflected scarcity values.

No studies have tried to measure the effects of these policies on the relative incentives in agriculture and manufacturing during these years. However, it is clear from the literature of the period that the economic policy thrust favored manufacturing. The period was therefore likely characterized by a marked anti-agricultural bias. This probably expanded along with the increasing overvaluation of the exchange rate and the countermeasures that concentrated on providing higher incentives to manufacturers in the domestic market and in exports, while attempting to keep agricultural prices low and stable.

From the 1966 devaluation to 1978

The nominal devaluation in June 1966 was 57.5 percent in relation to the pound sterling and the U.S. dollar, but, owing to high domestic inflation, it has been estimated at about 30 percent in real terms. In subsequent years, inflation was gradually brought down to much lower levels, and, by 1980, the real effective exchange rate had declined by another 46 percent (figure 10.2). The 1966 devaluation helped clean up some crisis-induced trade policies, but such policies were otherwise highly restrictive and interventionist.

In agriculture, one of the outcomes of the devaluation and, more importantly, of the suspension of U.S. Public Law 480 grain supplies from the United States during the first India-Pakistan war was to reinforce the government's determination to make India self-sufficient in food grains and other basic agricultural products. This coincided with the development and distribution of new seeds and techniques that were instrumental in practically eliminating once substantial cereal imports by the end of 1970s and that were behind the program launched in 1971 to make India self-sufficient in dairy products. To support these objectives, earlier policies were continued. With few exceptions, these allowed imports only of bulk agricultural commodity products, such as wheat, that were brought into the country by parastatals according to need. In the interests of domestic availability and low consumer prices, exports of most food products were not allowed although the domestic prices for some food products, notably rice, were usually well below farm-level export parity prices. Immediately after the devaluation, export taxes on nonessential exported commodities (jute, coffee, tea, cotton, oil cakes, spices) were sharply increased; the apparent purpose was to absorb some of the windfall gains accruing to exporters. However, because of slow export growth during the 1970s, these taxes were steadily reduced and had practically disappeared by the early 1980s.

In manufacturing, the 1966 devaluation was accompanied by tariff reductions, a relaxation in import licensing, and the abolition or reduction of some export subsidies. However, by 1968, tight import licensing had been reinstated, and imports of nearly all consumer goods, including textiles, were effectively banned; the only imports allowed were intermediate materials, components, and capital equipment as long as the actual users could demonstrate that the goods were essential and not otherwise locally available. Tariffs, which remained at about the same level during the 1970s, were still being used mostly to transfer some import licensing rents to the government and were irrelevant as protective instruments except to the extent they influenced the cost of imported intermediates and equipment that was not locally produced.

Empirical evidence suggests that trade policies during this period led to terms of trade that were more highly unfavorable for agriculture relative to manufacturing

in the domestic economy than the terms of trade prevailing in world markets (see elsewhere below).

From 1978 to 1993

The government averted a balance of payments crisis in 1980-81 with the help of a loan from the International Monetary Fund, while maintaining the real value of the rupee. However, beginning in the spring of 1985, a new policy was implemented that led to the steady devaluation of the currency in real terms. This devaluation continued without a break for the next six years, almost on a monthly basis, until the sharp devaluation in July 1991, which was followed by additional depreciation until September 1992. The real rupee devaluation was large during the second half of the 1980s, about 62 percent between 1985 and 1990, and it was around 145 percent over the whole period to 1993. Among other effects, this radically changed the environment of agricultural and manufacturing trade policies.

In agriculture, the rupee depreciation after 1985 partly offset a major decline in world agricultural prices that had started in 1981 and continued until 1987. World prices recovered thereafter, and the continuing rupee depreciation translated these world price changes into much larger increases in the border prices for some of the country's major agricultural commodities. However, owing to the traditional isolation of the domestic market, the domestic prices for most of these commodities were unaffected and continued to shift independently of the changes in the border prices. The principal exceptions were cotton, pulses, oil cakes, and the main export-oriented agricultural commodities that are sold in auction markets in which exporters and domestic traders compete, especially tea, coffee, spices, and tobacco. Despite many complex trade policy interventions and other interventions and owing to the influence of textile producers who were acting with the support of the Ministry of Textiles, domestic cotton prices broadly tracked border prices, and pulses were (and still are) the sole major primary food product that could be imported at low or moderate tariffs without import licensing or other interventions. The country has consistently possessed excess supplies of oil cakes (produced in fixed proportions by the edible oil industry in conjunction with the oilseed crushing process) because of low demand by the livestock subsector that is, in turn, associated with the vegetarian diets of a large proportion of the country's population. However, these products account for only a small share of total agricultural production, around 14 percent, and about 10 percent of total rural production if livestock, fishing, and forestry products are included. During this period, the rest (about 90 percent of total rural production) was essentially nontraded owing to government import monopolies, import licensing, export controls, and other non-tariff interventions, as well as prohibitive tariffs in some cases.

In manufacturing, during the 1980s, domestic prices were similarly delinked from international prices by the import licensing system and high tariffs that averaged over 100 percent. In addition, manufactured exports, although they were growing more rapidly than domestic production, were limited relative to total manufacturing output; the export share was only about 7 percent in the mid-1980s. Hence, overall, the massive rupee devaluation did not pass through directly to domestic industrial prices. It affected them indirectly in a minor way through increases in export prices and in the prices of intermediate and capital goods that were allowed to be imported, which increased manufacturing costs. The devaluation generated big increases in border prices, which led to a steep decline in average implicit manufacturing protection as measured by the excess in domestic ex-factory prices relative to border prices. This had important repercussions in manufacturing trade policies. First, it made the liberalization program that was undertaken in 1991 quite painless, including, especially, the abolition of nearly all import licensing for manufactured intermediate goods, machinery, and equipment, the removal of a major export subsidy, and the tariff reduction program that continued into the mid-1990s.

Second, many manufacturing firms that had been vulnerable to import competition found that, now, following the correction of the exchange rate overvaluation, they could not only easily compete with imports, but could outcompete with foreign manufacturers in export markets. Combined with the new, sweeping domestic deregulation of manufacturing that accompanied the trade policy program, this created fresh momentum in investment, productivity improvements, and output expansion in the manufacturing sector.

The devaluation's repercussions in agriculture and manufacturing led to the end of most of the systematic antiagricultural bias in the incentive system as measured by relative rates of assistance (RRAs). However, it did not translate into a noticeable improvement in the domestic terms of trade in agriculture because nearly all agricultural prices and a large proportion of manufacturing prices, including prices on all consumer goods, remained delinked from world prices by the import licensing system and other nontariff barriers and were still mainly determined by domestic conditions and government policies. This situation did not begin to change until after the import licensing system was finally removed in 2001.

From 1993 to 2007

From 1993 until mid-2007, the exchange rate was managed by regular adjustments in the nominal rates that stabilized the real effective exchange rate index at the postdevaluation level within a narrow range of about 10 percent (figure 10.2). The size of the devaluation up to 1993 probably overshot the decline needed to

reestablish the balance in foreign exchange and support the 1991 trade policy reforms. However, by being maintained at this level for the next 14 years (by far the longest period of real exchange rate stability in the independent economic history of India), it also proved adequate in supporting the removal of the import licensing system between 1998 and 2001 and the post-2003 tariff reduction program in manufacturing.

In agriculture, however, highly protectionist trade policies continued throughout the 1990s and were still in place in mid-2007. On the import side, high to prohibitive tariffs, plus technical standards and sanitary and phytosanitary controls, played the role previously played by import licensing and import monopolies among state trading enterprises.¹⁰ With some exceptions, the predominant view is that international agricultural markets are unreliable and unstable and should only have a residual role in agricultural policies, in particular, by providing extra supplies in times of domestic shortages and as a means of disposing of excess stocks in times of domestic surpluses. Consistent with this view, agricultural trade policies on some major commodities, especially cereals and sugar, are highly opportunistic and involve frequent and significant changes, especially in tariffs and export subsidies.¹¹ For other products, tariffs appear to be deliberately prohibitive. For example, 100 percent tariffs apply to tea and coffee, both of which are exported on a large scale. The domestic prices for these two products are set in auction markets in which exporters and domestic traders operate, suggesting that the domestic prices are about equivalent to international prices after allowing for quality differences.

In manufacturing, after the 1991 reforms, producers of intermediate and capital goods were no longer protected by import licensing, and manufacturing tariffs declined. Nonetheless, the devalued exchange rate, plus manufacturing tariffs (mostly in the 30–40 percent range) and other measures (notably antidumping initiatives), removed most competitive pressures on the import side. In addition, manufactured consumer goods, including the entire textile and garment subsector, were still protected by import licensing until the gradual removal of the system was initiated in the late 1990s. Hence, during the 1990s and up to about 2004, most manufacturing remained insulated from import competition, and the impact of world market conditions occurred mainly through manufactured exports, which, however, began to expand at a rate that was more rapid than the overall growth rate in manufacturing. This partial orientation toward world markets only changed in about 2004 following the end of import licensing in 2001 and the implementation of the first stages of the post-2003 manufacturing tariff reduction program. Since then, most of the manufacturing sector has been opened to world markets either through exports or through actual or potential imports at relatively low tariffs.

The 1985–93 devaluations removed most of the long-standing antiagricultural bias in the incentive system as measured by RRAs. However, high formal protection rates and substantial tariff redundancy in manufacturing and agriculture allowed plenty of scope for the domestic terms of trade between the two sectors to shift substantially in either direction. However, all this changed in the mid-2000s. Since then, tariffs have been a real constraint on the domestic prices for manufactured goods. The ongoing high formal protection of agriculture, combined with substantial input subsidies, has nonetheless offered considerable scope for the bias of the system against agriculture to become a bias in favor of agriculture.

The Measurement of Distortions in Agricultural Incentives

The main focus of our study is the extent of the distortions in agricultural prices and the government-imposed policy measures that create a gap between actual domestic prices and prices as they would emerge under free market conditions.¹² Since it is not possible to understand the characteristics of agricultural development through a sectoral view alone, we provide estimates of the effects of direct agricultural policy measures, including distortions in the foreign exchange market, and we also report estimates of distortions in the prices faced by the producers of nonagricultural products, especially manufactures. Specifically, we compute NRAs for farmers that include an adjustment for direct interventions directed at inputs, such as subsidies for fertilizers and electricity. For comparative purposes, we also generate aggregate NRAs for nonagricultural tradables and for agricultural tradables so as to calculate RRAs (see Anderson et al. 2008 and appendix A).

We examine 12 products, plus the collective of fruits and vegetables. Milk is classified as an import-competing product. The other 11 commodities—rice, wheat, maize, sorghum, groundnuts, rapeseeds, soybeans, sunflower seeds, sugar, cotton, and chickpeas—have mixed trade status, which means they are exportables or nontradables in some years and import-competing products in other years.¹³ Over the period we analyze, these primary agricultural commodities account altogether for nearly 70 percent of the value of agricultural production in India. The 11 crops have made up approximately half this share in recent years; fruits and vegetables, one-quarter; and dairying, another one-quarter (table 10.3).

Our study builds on a considerable body of earlier work, and we use the project methodology to provide a consistent and internationally comparable set of estimates back to 1964 (or, in the case of milk, 1975). The earlier work includes producer support estimates for the major crops in India in 1984–2001 that have been made available by the International Food Policy Research Institute, estimates for

Table 10.3. Structure of the Agricultural Economy, India, 1964–2004 (percent)

Product	1964–72	1973–79	1980–86	1987–96	1997–2004
Rice, including basmati	19.8	19.4	15.1	14.6	11.7
Wheat	4.5	6.0	9.5	9.2	9.5
Maize	1.2	1.1	1.2	1.0	1.3
Sorghum (<i>jowar</i>)	2.1	1.9	1.9	1.3	0.9
Soybeans	0.0	0.1	0.3	1.0	1.6
Rapeseeds, mustard seeds	0.7	0.7	1.1	1.4	1.3
Sunflower seeds	0.0	0.0	0.2	0.3	0.2
Chickpeas (<i>gram</i>)	2.4	2.8	1.9	1.6	1.4
Groundnuts	3.6	3.4	2.6	2.5	2.1
Seed cotton (<i>kapsas</i>)	2.3	2.5	2.5	2.4	2.1
Sugarcane	1.5	2.7	2.3	3.3	2.7
Fresh fruits and vegetables	12.7	13.6	14.8	14.4	13.9
Dairying	9.6	11.7	13.5	15.8	17.5
All covered products	60.4	66.0	67.0	69.0	70.7
Noncovered products	39.6	34.0	33.0	31.0	29.3

Source: Author estimates based on the farmgate value of production at domestic prices reported in CGA Database 2008.
Note: Values are at distorted prices.

fruits and vegetables in a recent World Bank study of the horticultural subsector in India, and NRA estimates for raw milk based on a study of the dairy sector (see Gulati and Kelley 1999; Mullen, Orden, and Gulati 2005; Rakotoarisoa and Gulati 2006; Orden et al. 2007; Mattoo, Mishra, and Narain 2007).

In considering our NRA estimates, one should bear in mind that, for most products in most of the years we cover, there were no exports or imports, or exports and imports were much too limited or specialized to provide reliable indications of the likely border prices of most domestic products. Consequently, domestic prices are compared with various international reference prices and then adjusted for delivery and selling terms, specification and quality differences, freight and insurance to or from the Indian border, Indian port costs, domestic transport costs and margins, and so on. Domestic and international transport and handling costs have been sufficiently high to make the major products non-tradable an average 40 percent of the time. The NRAs for fresh fruits and vegetables are especially sensitive to transport and handling costs because of the need for special packaging and transport and storage facilities, including refrigeration, to minimize spoilage and maximize shelf life at final wholesale and retail markets. Even for food grains, it is necessary to take into account domestic transport and trading margins from the inland growing regions to the large port cities before comparing farmgate prices and the estimated prices of equivalent imported products landed at the ports. These and numerous other complexities in estimating NRAs in India are discussed in Pursell, Gulati, and Gupta (forthcoming). Data sources and various data on the products are summarized in appendix B.

Other studies that have estimated NRAs or incentive indicators such as ours rely on the official exchange rate to express border prices in rupees (free on board or cost, freight, and insurance). During the years before the 1991 devaluation when the black market premium was substantial, almost all agricultural exports and imports were managed by parastatal monopolies under the direct supervision of the central bank (see Pursell, Gulati, and Gupta 2007). In manufacturing, there are reports that underinvoicing occurred in exports to accumulate unrecorded foreign exchange abroad; however, underinvoicing was limited because of the benefits available to exporters through various export facilitation schemes and export subsidies that were based on declared, free on board values. The main suppliers of foreign exchange in the parallel market for foreign exchange were Indian worker remittances from abroad and people in India who obtained foreign exchange to transfer black money out of the country. Since the 1991 devaluation, when the main export subsidy was removed and the foreign exchange controls of the Reserve Bank of India were relaxed, the parallel market premium has been negligible or nonexistent.

Table 10.4. Structure of Fertilizer and Electricity Subsidies, Key Crops, India, 2004
(percent)

Crop	Share in total subsidy	Share in gross value of production	
		At domestic prices	At reference prices
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
Chickpeas	2.7	11.4	10.9
Groundnuts	2.7	8.4	5.7
Rapeseeds, mustard seeds	4.5	11.7	18.0
Soybeans	1.1	4.3	2.9
Sunflower seeds	0.5	8.8	8.6
Sugar	6.6	12.5	15.4
Cotton	5.6	13.2	12.3
Total	100.0	16.9	13.0

Source: Pursell, Gulati, and Gupta 2007.

Note: The total value of the input subsidies for the 11 crops in 2004 was US\$7.8 billion: US\$1.9 billion for fertilizer and US\$5.9 billion for electricity.

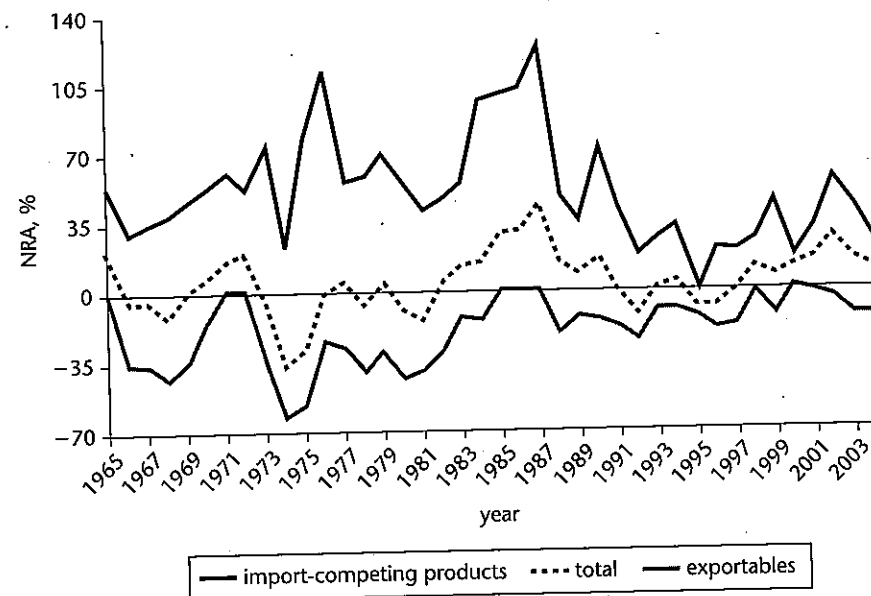
Assistance in agriculture

We have calculated NRA estimates for India for crops beginning in 1964 and for dairying (raw milk) beginning in 1975. The NRAs account for output price distortions, as well as for the output price equivalents of input subsidies. (The latter estimates begin in 1983.) The NRAs are expressed as a percent share of the corresponding undistorted prices (for example, the import reference prices of comparable products). Relevant input subsidies have been allocated to the various crops in the manner summarized in table 10.4.¹⁴

Our NRA estimates exhibit several striking features. First, the average NRAs across covered products show only a slight upward trend over the 41 years we survey (figure 10.3 and table 10.5).

Second, figure 10.3 and table 10.5 also show that the average NRAs for import-competing products were well above the average NRAs for exportables, although the difference narrowed after the reforms were launched in the early 1990s. Specifically, the average NRAs for import-competing products were 62 percent in the 25 years to the end of the 1980s, but only 32 percent over the subsequent 15 years,

Figure 10.3. NRAs for Exportable, Import-Competing, and All Agricultural Products, India, 1965–2004



Source: Pursell, Gulati, and Gupta 2007.

while the corresponding NRAs for exportables were -25 and -11 percent, respectively. This is captured in the average trade bias index, which was -0.53 during the period before 1990 and -0.32 thereafter (table 10.6).

Third, the NRAs fluctuate widely around the trend values. Even if the NRAs are averaged over all import-competing products or all exportables, it is clear from figure 10.3 that there is significant movement in the NRAs from year to year. This is partly because the trade status of products often changed, but there is also a clear systematic element in this finding. Before the reforms of the 1990s, the average NRAs for import-competing products and exportables were lowest in 1974, when international food prices were at record highs, and highest around 1987, when international food prices were at record lows in real terms. More generally, there is little year-to-year correlation between the domestic prices and the border prices of major food products. This reflects the success of the government's policy effort to stabilize domestic prices and insulate domestic markets from fluctuations in world prices.

Table 10.6. NRAs for Covered Agricultural Products, India, 1965–2004 (percent)

Product, indicator	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Milk	—	—	152.6	113.5	136.8	40.5	22.1	32.3
Rice	30.0	23.4	39.2	31.0	3.8	21.1	13.0	20.8
Wheat	31.4	30.3	2.8	1.6	9.2	10.5	14.2	38.4
Maize	63.8	49.2	2.6	1.2	26.5	3.1	2.6	11.9
Sorghum	41.7	55.0	11.6	6.5	35.7	7.2	21.2	15.7
Groundnuts	23.4	1.6	17.0	21.7	61.6	17.7	7.9	12.9
Fruits and vegetables	0.0	0.0	0.0	0.0	0.0	15.7	13.4	8.9
Rapeseeds, mustard seeds	62.9	38.8	16.6	38.2	74.8	64.8	37.0	64.8
Soybeans ^a	—	0.0	14.8	1.3	19.1	3.1	2.9	2.9
Sunflower seeds	—	—	0.0	7.8	56.1	17.9	13.3	14.6
Sugar	158.4	17.7	9.4	9.5	56.0	7.2	12.6	39.3
Cotton	17.5	78.3	8.9	0.4	33.6	22.6	6.2	12.0
Chickpeas	24.5	1.3	0.0	7.7	12.2	9.2	15.0	18.7
Import-competing products ^b	41.2	52.6	74.4	59.0	81.5	38.3	22.6	34.2
Exportables ^b	30.0	22.3	35.8	27.8	6.8	15.4	12.4	6.1
Nontradables	0.0	0.0	0.0	0.7	4.0	6.8	16.1	22.6
All covered products ^c	0.2	0.2	5.5	1.9	24.9	1.8	0.6	15.8
Input subsidies	—	—	—	—	4.6	5.8	7.6	9.7
Dispersion, covered products ^d	42.8	17.8	6.5	18.8	49.0	45.6	12.5	21.1
Coverage, at undistorted prices	59	62	68	66	68	69	72	70

Source: Pursell, Gulati, and Gupta 2007.

Note: — = no data are available.

a. 1970–74 refers to 1973–74.

b. Products of mixed trade status are included among exportables or import-competing products depending on the trade status each year.

c. Weighted averages; the weights are based on the unassisted value of production.

d. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of the NRAs of covered products.

Table 10.6. NRAs in Agriculture Relative to Nonagricultural Industries, India, 1965–2004
(percent)

Indicator	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Covered products ^a	-0.2	0.2	-5.5	1.9	24.9	1.8	0.6	15.8
Noncovered products ^b	-0.2	0.2	-5.5	1.9	24.9	1.8	0.6	15.8
All agricultural products ^c	-0.2	0.2	-5.5	1.9	24.9	1.8	0.6	15.8
Trade bias index ^d	-0.51	0.50	-0.63	-0.55	-0.48	-0.38	-0.28	-0.29
NRA, all agricultural tradables	-7.0	12.6	-7.4	4.1	67.5	2.0	-2.3	15.4
NRA, all nonagricultural tradables	113.0	83.1	64.8	59.3	48.6	15.9	12.6	5.2
RRA ^d	-56.3	-38.3	-43.8	-33.5	11.7	-12.1	-12.9	12.5

Source: Pursell, Gulati, and Gupta 2007.

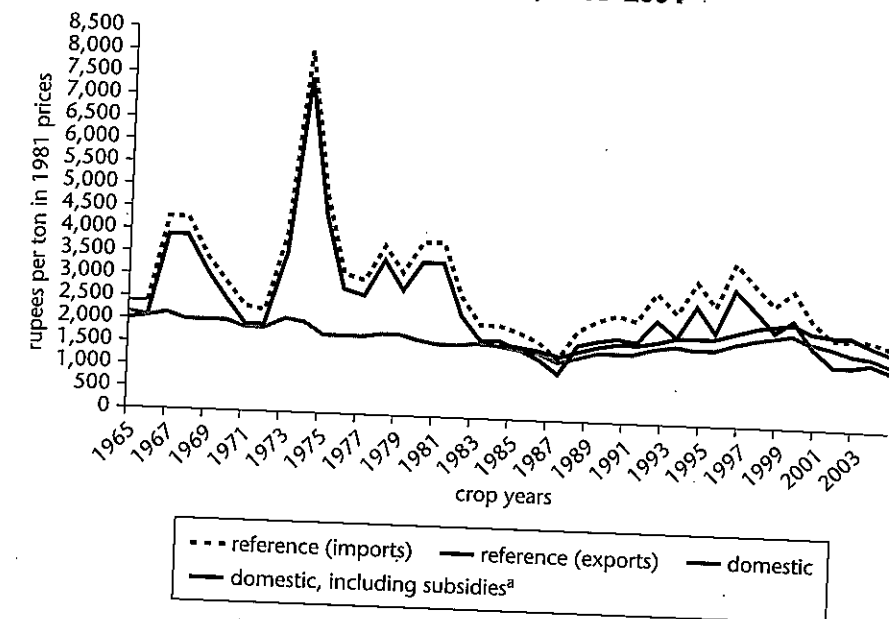
a. Including product-specific input subsidies and non-product-specific assistance (see table 10.5). Represents total assistance to primary factors and intermediate inputs, divided by the total value of primary agriculture production at undistorted prices.

b. Noncovered products—30 percent of the sector's value of production in 2000–04—are assumed to have the same average NRAs as covered products, as well as the same shares of production in the import-competing, exportable, and nontradable categories.

c. The trade bias index is defined as $(1 + NRA_{ag}/100)/(1 + NRA_{nonag}/100) - 1$, where NRA_{ag} and NRA_{nonag} are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector, respectively.

d. The RRA is defined as $100 \times (100 + NRA_{ag}) / (100 + NRA_{nonag}) - 1$, where NRA_{ag} and NRA_{nonag} are the percentage NRAs for the tradable parts of the agricultural and nonagricultural sectors, respectively. NRA_{nonag} in 1965–69 is an author's estimate.

Figure 10.4. Real Domestic Producer Prices and International Reference Prices, Rice, India, 1965–2004



Source: Pursell, Gulati, and Gupta 2007.

Note: To remove the effects of inflation from the analysis, rupee prices are expressed in constant 1981 rupees using the wholesale price index.

a. No data prior to 1984.

This insulating role of policy measures is especially clear in the country's main food staple, rice. The domestic price of rice has been kept stable in real terms over the past four decades (figure 10.4). For most of these years, export restrictions have generated an implicit export tax on rice that has varied substantially as international prices have changed. For example, in the 1990s, the annual average implicit export tax varied from zero to 31 percent to keep the real consumer price from fluctuating (Pursell, Gulati, and Gupta 2007). Figure 10.4 also shows that this insulating policy generated positive NRAs for rice in 2000–04. Had the data been available for more recent years, they would have revealed that, with the boost in the international price for rice in 2007–08, the country again imposed restrictions on rice exports, thereby implicitly taxing net sellers of rice for the benefit of net buyers of rice.

Sugar is another example. As in many other countries, sugar is still subject to sporadic government interventions in India, especially through trade policies. In 2007, for example, the relevant trade policies included de facto nontariff import controls, a 60 percent import tariff, the availability of export subsidies, and a complex initiative that allowed sugar mills with excess capacity to import unrefined

sugar duty-free for refining and then resell in the domestic market. These measures were implemented to insulate the domestic market from wide swings in international sugar prices, but also to help address domestic disequilibria resulting from weather conditions and from production cycles imposed by the highly politicized minimum sugarcane prices mandated by state governments. Likewise, in 2000–02, export subsidies were used to help dispose of large excess sugar stocks, whereas, in some years during the 1990s, imports were allowed duty-free to meet temporary domestic shortages.¹⁵ Similar to the case of rice, domestic sugar prices have been kept quite stable for long periods, but have steadily declined in real terms over time. Thus, between 1965 and 1982, they declined by about one-third, and, between 1981 and 2004, by one-quarter.

Fourth, the dispersion of NRAs across the products we cover has been wide, although it has narrowed considerably since the reforms began in the early 1990s. Shortly before then, the average annual standard deviation around the weighted mean NRA was 45, whereas, since 1990, the average has been less than half that (see near the bottom of table 10.5).

Fifth, the contribution of farm input subsidies in the NRAs for covered products have been steadily increasing, particularly fertilizers and electricity, which is used mainly in pumping irrigation water. In the later 1980s, input subsidies contributed 4 percentage points to the average NRA of 25 percent (data have not been compiled for earlier years), but, by 2000–05, they were contributing almost 10 percentage points (see near the bottom of table 10.5).¹⁶ Without input subsidies, the average NRA would have been negative in the 1990s, mainly because of the restrictions on exports of rice. (The weight of rice has been between around one-eighth and one-third over the past four decades; see Pursell, Gulati, and Gupta 2007.) Input subsidies helped reduce the gap between the benefits to rice producers and the export price of rice in the 1990s (figure 10.4).

Sixth, while the trade status of each crop product we cover has tended to change frequently over the past four decades, self-sufficiency in each product nonetheless remains close to 100 percent (table 10.7). Thus, in so far as government policies on food pricing and trade have been aimed at reducing the country's dependence on food imports, they have achieved their objective.

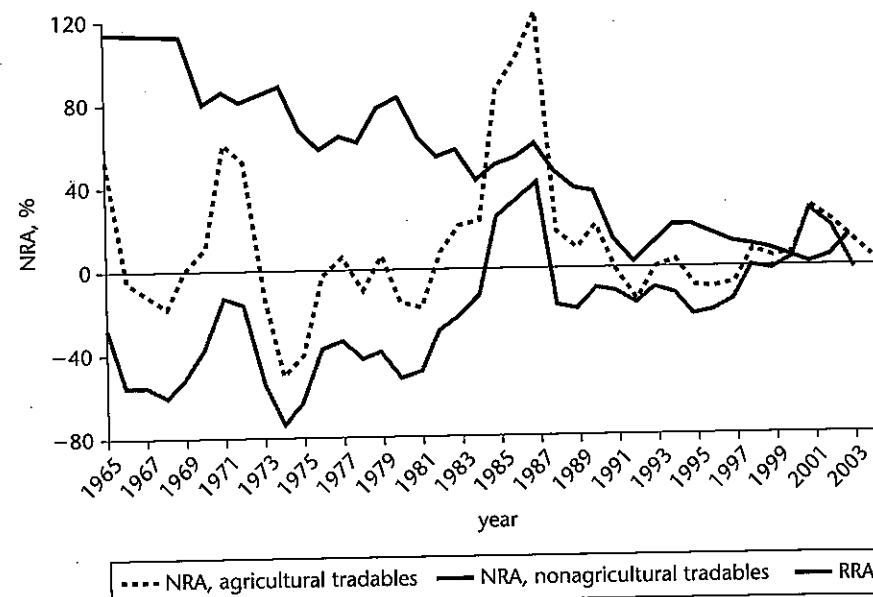
Assistance to producers of agricultural tradables relative to other tradables

In the absence of precise information, we have assumed that the average NRAs for covered products are the same as the corresponding NRAs for noncovered farm products, which accounted for 30 percent of total agricultural production in 2000–04. The incentives among farmers depend not only on agricultural NRAs,

Table 10.7. Self-Sufficiency Ratios, Selected Food Products, India, 1961–2004
(percent)

Product	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Milk	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Rice	0.99	0.98	0.97	1.01	1.05	1.04	1.04	1.05	1.02
Wheat	0.72	0.71	0.91	1.02	0.99	0.96	1.00	1.02	1.02
Maize	0.97	0.97	1.00	1.00	1.00	0.99	1.00	1.00	1.01
Sorghum	1.00	0.92	0.96	0.99	1.00	1.00	1.00	1.00	1.00
Groundnuts	1.01	0.99	1.02	1.03	1.02	1.02	1.02	1.04	1.02
Soybeans	0.96	0.89	1.02	1.03	1.07	0.95	0.98	1.15	0.94
Sunflower seeds	—	—	1.00	1.00	1.00	1.00	1.00	1.00	1.04

Sources: Author computation based on data in FAO Agricultural Trade Database 2008; FAOSTAT Database 2008; FAO SUA-FBS Database 2008.
Note: The table shows production as a proportion of consumption. — = no data are available.

Figure 10.5. NRAs for Agricultural and Nonagricultural Tradables and the RRA, India, 1965–2004

Source: Pursell, Gulati, and Gupta 2007.

Note: For the definition of the RRA, see table 10.6, note d.

however. They also depend on the way trade and other price-distorting policies affect the incentives among producers of other tradables. To help one understand the evolution of relative incentives, we compare, in figure 10.5 and table 10.6, the NRAs for agricultural tradables with estimates of the NRAs for nonagricultural tradables. We also indicate our estimates of RRAs (see table 10.6, note d). The NRAs for nonfarm activities are weighted averages of the estimated NRAs for the tradable parts of manufacturing and mining. In these NRAs, we thus assume that the services sector is nontradable, which has been a reasonable assumption until recently; even today, the tradables part of the services sector is small relative to the size of the goods sectors.

Until about 2004, average tariffs were not helpful indicators of the protection in the manufacturing sector. We have therefore used the results of a recent study by Pursell, Kishor, and Gupta (2007) on the implicit protection in manufacturing that covers 1970–2004. The study provides a time series that compares the annual weighted averages of the ex-factory prices of manufactured goods and the import prices of the same or similar goods.¹⁷ This measure plausibly describes the

economic history of the period. First, the extremely high implicit nominal protection of between 80 and 100 percent from the 1970s to the mid-1980s is consistent with what we know about the restrictive import licensing system of that period. Second, the steep decline in implicit nominal protection, from around 70 percent in 1987 to almost zero in 1992, is consistent with the real rupee devaluation of approximately 80 percent during the same period (see figure 10.2). The decreasing value of the rupee during these years pushed up the border prices of importable manufactured goods expressed in rupees, and these increases were far greater than the corresponding increases in the prices for domestically produced manufactured goods, which mirrored domestic inflation and other factors. Consequently, the average excess of the prices for domestically manufactured goods over the rupee border prices for the same goods consistently declined, and it seemed nearly to disappear altogether in 1992. After 1992, it increased for a while (between 1995 and 1997, though this may have reflected the low international prices associated with the Asian financial crisis), but, in most years, it was well below 20 percent; the average rate was only 12 percent between 1992 and 2004 (the latest year for which estimates are available). Until 2002, the apparent implicit protection rates were far below unweighted average industrial tariffs, for example, 45 percent in 1990 versus average tariffs of 129 percent, 9 percent in 1999 versus average tariffs of 39 percent, and 5 percent in 2002 versus average tariffs of 33 percent. This gap narrowed sharply in 2003, however, and the possibility that domestic prices would exceed international prices was reduced by the cuts in manufacturing tariffs in the March 2007 budget, which decreased the average tariff to below 10 percent.

The most important group of nonfarm tradable products other than manufactures are minerals, especially coal, iron ore, crude oil, and natural gas. These industries account for about 2.5 percent of GDP. The tariffs on these items are currently low (in 2007, mostly zero, 2 percent, 5 percent, or 10 percent, respectively); except for crude oil and petroleum products, there are no major quantitative restrictions on imports or exports. Trade in these products is considerable; there are substantial imports (for example, coal) and exports (for instance, iron ore). We have constructed for this study an NRA series that begins with an assessment of the situation in 2004. For coal, which accounted for about 62 percent of domestic mineral subsector output in 1970 and about 38 percent in 2004, these estimates assume that domestic prices were about equal to import reference prices in 2004 (NRA = 0); we have generated NRA estimates for earlier years using the coal wholesale price index for India and an index of coal export prices for Australia.¹⁸ The NRAs for coal are low in many earlier years, which is consistent with the depression of domestic coal prices, coal production, and, potentially, coal exports by Coal India, the parastatal monopoly that controls the industry. This changed during the late 1990s, when accelerating demand for coal pushed up

domestic prices to about the level of import prices. This eventually led to the current situation, wherein coal is being imported in large quantities, mostly at zero tariffs. The other principal components of the mining sector are petroleum, natural gas, and a catch-all category that includes all other minerals. In the absence of any recent studies on protection in these subsectors, we have assumed, based on limited information and other analysis, that the NRAs of these components were zero over the whole period. Based on this assumption and our estimates for coal, we have derived a weighted average NRA series for mining. The series comprises low NRAs up to about the mid-1980s, followed by NRAs in the vicinity of zero, indicating that average domestic mineral prices were about equal to world prices from 1985 to 2004.

In figure 10.5 and table 10.6, we do not show the NRAs for mining separately, but combine these with the NRAs for manufacturing to provide a series of weighted average NRAs for manufacturing and mining together, wherein the value added at distorted prices is used as weights.¹⁹ Our estimates for manufacturing and mining go back only to 1970. The average NRAs for 1965–69 (113 percent) are guesstimates based on the belief that, in those years, the average NRAs would have been somewhat higher than the average NRAs in 1970–74. NRAs at about the level of our estimates seem plausible in light of the economic situation during this period. (See our discussion elsewhere above on manufacturing trade policies prior to and following the 1966 devaluation.) For the rest of the years we cover and for which we give estimates, the share of the mineral subsector in combined value added ranged from 7 to 14 percent and averaged around 12–13 percent. The implicit taxation of the mining subsector during the 1970s and early 1980s pulled the combined weighted average NRAs below the corresponding NRAs for manufacturing alone. However, the combined rate, though declining, remained high during these years. Beginning in about 1993, however, and following the steep decline in the implicit protection for manufacturing that accompanied the 1985–93 rupee devaluations, the two series merged at much lower levels, leading to historically low assistance levels in these sectors in 2001–05.

It is clear from figure 10.5 and table 10.6 that, from the mid-1960s to the mid-1980s, the assistance going to producers of nonagricultural tradables far exceeded the assistance going to farmers. This is reflected in our calculations of the RRA, which is an indicator of the distortion to farm prices relative to nonfarm prices for tradables. In the 1960s and 1970s, the RRAs suggest, farmers effectively received less than half (average RRAs of –51 percent) the relative price for their products that they would have received under free markets. Because of the drop in international food prices in the mid-1980s, the extent of the implicit export tax on rice and other exportable farm goods fell markedly, generating a rise in the NRAs for farm and nonfarm tradables to the same level so that RRAs were above zero in

1985–87. After the return to trend international food prices in the 1990s, the agricultural NRAs fell to close to zero so that, even though the NRAs for nonfarm industries were reduced by more than half, the RRAs returned to negative values (averaging –13 percent during the decade). Although protection in manufacturing fell dramatically during the 1985–93 devaluations, the devaluations also pushed up agricultural reference prices and reduced agricultural NRAs. Hence, following the devaluations and associated reforms, the antiagricultural bias in the system continued, but it was now far less marked. Then, beginning around 2000, more reductions in the protection for manufacturing, combined with a rise in agricultural input subsidies, boosted agricultural NRAs above the NRAs for nonfarm tradables once more.

Where Are Indian Policies Heading?

Protection levels in most Indian manufacturing and also in the mining subsector are now constrained by low tariffs. Even in a few of the industries protected by high tariffs, such as textile fabrics, garments, and auto assembly, expanding exports and domestic competition suggest that prices are unlikely to rise much above world prices in the foreseeable future. In contrast, most tariffs and other formal instruments protecting the agricultural sector are much higher than the implicit protection rates, and, if they are maintained at current levels, they will not stop domestic prices from rising well above world prices.

Is it probable that the government will follow a high-protection, high-subsidy path in agriculture as the Indian economy develops? The political economy of this issue is complex. Some forces and some arguments appear to make it likely that a high-protection path in agriculture will be followed, while others argue against this outcome.

The politically important considerations favoring protection over open trade policies are as follows: the high share of employment in the rural sector (still around 60 percent), the desire to insulate farmers from the large price fluctuations that occur in world agricultural markets, and the feeling that the country should be self-sufficient or nearly self-sufficient in the production of basic foods and other agricultural commodities. (The last argument is based on the notion that demand is too substantial to rely on world markets for supplies in the event of serious crop failures or other disruptions to supplies.) These general arguments for protection reinforce the economic interests of farmer groups that are highly organized and politically effective at lobbying with the states and the central government. Within the central government, the Ministry of Agriculture represents farmer interests and ensures that these views are heard in policy discussions. These are the basic reasons for the exclusion of agriculture and the food processing

industries from the liberalizing trade policy reforms in 1991, for fixing high tariff bindings during the Uruguay Round multilateral negotiations, and for leaving agriculture out of the unilateral tariff reduction program that started in 2003. They also explain the currently high agricultural tariffs, which have been deliberately set at prohibitive levels to keep out imports in case there is a dip in world prices or the opening of a niche market opportunity for imports.

In contrast, because of the high share of food in household budgets in India, there is strong pressure to keep agricultural prices down. For many years, this goal dominated agricultural policies and was compatible with expanding agricultural production and national self-sufficiency largely because of the successful adoption of Green Revolution technologies in crop agriculture, in conjunction with large-scale government investment in irrigation and other rural infrastructure. Between 1965 and 1988, domestic rice and wheat prices declined by 44 and 52 percent in real terms, respectively. Because of steadily increasing farm productivity, this major long-term benefit to consumers was compatible with rising farmer prosperity, especially in northwestern India. There were also additional benefits arising among low-income households from subsidized rice and wheat supplied through the public distribution system. Moreover, the trade policy regime of the period kept the prices of the principal food grains low—directly through export restrictions and indirectly through the exchange rate overvaluations that were generated by the high-protection import-substitution policies in place in manufacturing. In the case of rice, an export ban was in force in 1965–88, and average domestic rice prices were about 23 percent below export parity prices and were lower still in relation to export prices under counterfactual simulations of the exchange rate under free trade.²⁰ In these ways, food consumers benefited at the expense of farmers during the license Raj, although they lost as consumers of manufactured goods and, much more importantly, as a consequence of the missed opportunities for more rapid overall economic growth that was forgone because of these policies.

There are no organized groups representing the interests of food consumers. Nonetheless, politicians and bureaucrats are sensitive to consumer concerns over food prices, which are a major topic in public debates, especially debates on the efficacy of the supply of below-poverty-line groups with subsidized wheat, rice, and sugar through the public distribution system. In these ways, consumer interests remain important counterforces to the producer lobbyists pressing for higher agricultural prices, usually through increases in support prices.

However, a number of factors limit the extent to which public concerns over consumer welfare constrain lobbying groups in favor of farmers and other producers.

First, politicians and government bureaucrats are mainly sensitive to increases in the retail prices of mass consumption staple foods, including wheat, rice, sugar,

edible oils, milk, pulses, and selected vegetables such as onions. They are less concerned about the prices for other food products, especially fresh fruits, other vegetables, and spices because consumers have long been accustomed to fluctuating prices in retail and wholesale markets for these products.

Second, as in other countries, producer lobbying groups can be at least partially placated through increases in input subsidies without incurring the political pain that may follow output price increases. This explains the rapid rise in fertilizer and electricity subsidies since 1985, the long-term decline in canal irrigation fees for water, and subsidized credit for farmers supplied through government banks. It also explains the government's reaction to the 2007–08 boom in world agricultural and fertilizer prices, which included a ban on rice exports that was aimed at protecting domestic consumers, but also raised subsidies to keep domestic fertilizer prices below world prices; the latter was aimed at placating farmers. However, there were limits to increases in these subsidies. For example, no additional subsidy was possible if electricity was being supplied free of charge, which was the case in a number of Indian states. The subsidies had other consequences, notably, the effects of the farm electricity subsidies on state government budgets and the viability and operating efficiency of state electricity boards and the effects of the fertilizer subsidies on the central government budget (Gulati and Narayanan 2003). Until around 2005, there were signs that these limits and consequences may have checked the rate of growth in farm subsidies.

Third, the objective of national food self-sufficiency sometimes trumped the concerns about consumer welfare. The clearest example is the unsuccessful attempt to replace palm oil imports by domestic production through import restrictions initially and through high tariffs currently (85 percent). Over long periods, dairy import policies also involved high consumer prices without generating much debate on behalf of consumers. In both cases, the interests pushing for the import-substitution policies dominated public discussions, and there seems to have been little, if any, public awareness that lower prices were a realistic alternative.

Fourth, the political concern about the prices for staple foods was mainly an issue of price stability, rather than about price level. If prices unexpectedly decline, producers become worried; consumers worry if prices unexpectedly increase. Although organized commodity markets and trade associations were reporting on international commodity prices, there was little public interest in the divergence between domestic prices and world prices. Thus, as long as there are no sudden large price changes in the current context of high redundant tariffs, it is quite plausible that domestic food prices might steadily rise and diverge from international prices, especially if general inflation is low and the exchange rate appreciates.

Fifth, producers have discovered they can be effective in blocking imports without attracting much opposition if they act quickly and early before the

imports achieve much domestic market penetration. There is minimal established importer and consumer interest to overcome if this is the approach. If imports are blocked early, there is no or little subsequent consumer and political awareness of imports as a lower-cost alternative to domestic production. Increases in tariffs on chicken parts and garlic (from 35 to 108 percent in 2001 and in 2003, respectively) are recent examples of this strategy, and the same strategy might be applied to other products if imports threaten to overcome the already comprehensive protective barriers.

This all suggests that the political interest in low consumer prices is unlikely to represent an obstacle to increases in agricultural protection, while domestic and external conditions could conceivably create strong producer pressure for agricultural protection. Medium- or long-term scenarios that would favor a boost in protection might include a loss in the ability of the domestic production of major crops such as rice and wheat to respond to domestic demand, leading to pressure for increases in prices or in input subsidies to maintain self-sufficiency; a fall in world prices in a context of stable or slowly rising domestic prices in real terms; a real exchange rate appreciation that reduces rupee border prices, while domestic prices remain about the same or only slowly increase; or limited progress in achieving a reduction in agricultural protection in developed countries through negotiations at the World Trade Organization. This last would reinforce the already strong resistance to liberalization in the government's agricultural trade policies on the argument, first, that tariff concessions should be held in reserve as a bargaining chip to exchange for substantial concessions by developed countries and, second, that continuing the isolation of the domestic markets in developed countries perpetuates price instability in world markets, and the government's trade policies should therefore continue to insulate domestic markets in India from world market conditions.²¹

Scenarios that might ease the pressures for greater protection include stable world prices in a long-run rising trend; productivity increases, especially in yields and in transport, storage, and marketing, that might partially or fully offset other factors tending to raise domestic prices relative to border prices; productivity and production increases that lead to exportable surpluses and growing pressure to cut production if export subsidies are needed to profitably export surpluses; successful negotiations with the World Trade Organization on reductions in the protection and the subsidies (especially export subsidies) in developed countries; greater willingness in India to implement more open agricultural trade policies; and successful negotiations through the World Trade Organization to close or tighten loopholes permitting export subsidies and more active enforcement by other countries so as to facilitate the Indian government's no-export-subsidy commitment under the Uruguay Round Agreement on Agriculture.²²

A distinction needs to be made between changes in implicit protection and changes in the formal protective instruments such as tariffs. Under a scenario of greater protection, domestic prices would rise relative to world prices. However, because of the considerable redundancy in the level of formal protection, big increases could occur without a boost in tariffs or tighter protection. If tariffs and other formal protective instruments are to be reduced, the initiative must come through the World Trade Organization; there appears to be little or no domestic pressure to achieve such a reduction.

Notes

1. Unless otherwise indicated, throughout the paper, the years are Indian financial years. For example, 1996 is 1996/97, that is, the financial year from April 1, 1996 to March 31, 1997. This includes the various time series, except for some series that are based on crop years (for example, sugar and sugarcane).

2. Agriculture is used here and in other places in the chapter in a broad sense to include crop agriculture, horticulture, livestock activities, inland and ocean fisheries, and forestry activities. This broad use of the term should be apparent from the context. However, our computations of rates of assistance in agriculture include livestock, but not fisheries or forestry, which is consistent with the usage throughout the volumes in this World Bank research project.

3. In this and the following section, the discussion of policies before 1990 relies to a large extent on Pursell (1992). More information on the earlier years, especially the 1960s and 1970s, may be found in the references cited there.

4. The techniques included modest general tariff increases through the use of para-tariff measures and customs duties in 1997–2001; prohibitively high tariff bindings that, under the Uruguay Round Agreement on Agriculture, may be applied to products freely within a wide range (100, 150, or 300 percent); specific tariffs on most textile fabrics and garments that were implemented beginning in 2001 and that are sufficiently severe to discourage any imports of these products from entering the domestic market; local-content rules in the auto industry that were introduced in 1995 and dropped in 2002 following objections by other World Trade Organization members; the widespread use of antidumping measures that were undertaken in the early 1990s and have been applied mainly to manufactured intermediates; the use of state trading enterprises to control imports of cereals, fertilizers, and petroleum products; the use of tariff rate quotas to protect local producers of edible oils and powdered milk; new rules on technical standards introduced in 2000 within the administration of the Bureau of Indian Standards; new sanitary and phytosanitary rules applicable to imports of nearly all agricultural, livestock, and food products under the general supervision of the Ministry of Agriculture; ad hoc export subsidies that are used periodically to dispose of agricultural surpluses (for example, in wheat and sugar) and that are certainly inconsistent with the spirit and, possibly, also with the letter of the government's no-export subsidy commitments under the Uruguay Round Agreement on Agriculture; and, starting in 2005, a subsidy scheme for exports of fruits, vegetables, dairy products, and poultry (NIAM, various). Within India, the predominant view appears to be that technical barriers to trade rules and sanitary and phytosanitary measures, in addition to the legitimate roles sanctioned by the World Trade Organization, are instruments that may be activated or withdrawn according to whether individual industries are in need of nontariff protection against imports.

5. The information has been calculated from data on tariffs and other import taxes published annually in Goyal (various). These publications also provide detailed information on quantitative import restrictions, sanitary and phytosanitary measures, rules on technical barriers to trade, bilateral and regional trade agreements, and other trade policy instruments. Additional reductions in industrial tariffs appeared in the 2008 budget.

6. The main exceptions to the low industrial tariffs are specific duties on most textile fabrics and garments and a 60 percent tariff protecting the auto industry. However, there is evidence of considerable tariff redundancy in these industries, whereby typical domestic ex-factory prices are about equal to or even below the import prices. There are also nontariff barriers protecting domestic urea producers, and the domestic prices for products derived from some of these plants are high relative to world prices.

7. Two exceptions are the rice imports of Bangladesh from India and India's imports of raw jute from Bangladesh, both of which are subject to low tariffs.

8. A World Bank study (2006) of the likely consequences of a free trade agreement between Bangladesh and India finds that the prices for many agricultural products and processed foods are higher in Bangladesh than in India. It concludes that, under a bilateral free trade agreement, there appear to be few possibilities for expanded agricultural and processed food exports from Bangladesh to India, but considerable potential for increased Indian agricultural exports to Bangladesh. The latter would involve trade diversion costs for Bangladesh, including lost customs revenue, resulting from the replacement of duty-paying imports from the rest of the world by duty-free imports from India.

9. A comprehensive account of the Indian government's macroeconomic policies, including exchange rate policies, between 1964 and 1991 is offered by Joshi and Little (1994).

10. One major role of state trading enterprises in import and domestic policies was eliminated in June 2006, when it was announced that cereal imports would no longer be a monopoly of the Food Corporation of India. It was also announced that this entity would no longer buy wheat and rice at procurement prices, but, instead, would rely on competitive wholesale markets to purchase the supplies needed for the public distribution system and general food security stocks. However, in 2006, wheat and rice tariffs, at 50 and 70–80 percent, respectively, were prohibitive.

11. Reductions in agricultural tariffs are often undertaken through special partial or complete exemptions on a particular occasion or for a particular importing organization, while the most-favored-nation tariff is formally left unchanged. Between 2001 and 2005, substantial export subsidies were paid to make it worthwhile for private traders to help dispose of large excess wheat stocks. In February 2006, it was announced that, in view of the inadequate stocks, the Food Corporation of India would import 0.5 million tons of wheat at zero duty. Sugar trade policies have been especially opportunistic. There have been significant changes in sugar tariffs over the last 15 years or so, and, between 2001 and 2004, when about 4.3 million tons were exported, export subsidies were used extensively (Pursell 2007).

12. For the reasons discussed in appendix A, tariffs have been irrelevant as indicators of the actual differences between domestic and prevailing world prices for nearly all primary and processed agricultural products. Our estimates of the actual rates of assistance must therefore rely on painstaking direct product-by-product comparisons of domestic prices and border prices, adjusted by port, handling, and domestic transport costs and supplemented by information on the subsidies and rates of protection for inputs.

13. The trade status of each product in a given year is endogenously determined in the analysis depending on whether the domestic price was greater than the import reference price (import-competing), less than the export reference price (exportable), or between these two (nontradable). The import reference price (also often called the *import parity price*) is the cost, insurance, and freight price, plus port, handling, transport, and other charges. The export reference price (also known as the *export parity price*) is the free on board price, minus transport, handling, and other charges incurred in getting the product to the free on board stage. The trade status is the same in at least two-thirds of all years for only 3 of the 13 product groups Pursell, Gulati, and Gupta (2007) cover in their analysis (see their appendix table A4).

14. On the complexities of calculating input subsidies in the Indian context, see Gulati and Narayanan (2003). There are implicit taxes on other tradable farm inputs because of import licensing and tariffs, but, in the second half of the 1980s, these taxes were quite small relative to fertilizer and electricity subsidies (Gulati, Hanson, and Pursell 1990; Pursell and Gupta 1998; Gulati and Kelley 1999). The implicit taxes declined, along with the decline in protection in manufacturing, during the rupee devaluations in 1985–93. By 2007, most tariffs on nearly all manufactured farm inputs and also

on trucks and specialized handling, storage, and agroprocessing equipment had declined to 7.5 percent. Hence, excluding these generates an upward bias in the estimated contribution of input subsidies in crop NRAs probably by less than 1 percentage point.

Indian farmers also benefit from subsidized credit and are exempt from income taxes, but these subsidies are small relative to fertilizer and electricity subsidies. More importantly, farmers receive subsidized water through canal irrigation schemes that charge fees well below the costs of operation and maintenance. Moreover, farmers do not contribute to the capital costs of the dams, canals, and other public infrastructure from which they are the principal beneficiaries. The resource allocation consequences of the canal irrigation subsidies are especially problematic because the water supplied through canal irrigation is rationed. Thus, an increase in water fees would only transfer economic rents from farmers to the recipients of the fees (mainly state governments) without directly affecting the production of the irrigated crops. For this reason, we do not cover canal irrigation subsidies in our study.

15. Over long periods, sugar prices in India have been much lower than sugar prices in Bangladesh, where prices have been well supported, through quantitative restrictions initially and, later, through customs duties and various para-tariff measures. The price differences in the two countries have generated a regular legal export trade from India to Bangladesh, as well as substantial unrecorded smuggling in exports across the porous land border to Bangladesh (Pursell 2007; see also chapter 9 in this volume). However, the quantities exported, though constituting large shares of the market in Bangladesh, have not been sufficient to have much impact on domestic prices in India. If the government of Bangladesh were to remove or substantially reduce sugar tariffs, a principal initial impact would probably be to divert a considerable portion of the smuggled imports from India into legal channels. Sugar prices in Pakistan are at about the same general level as Indian prices, and there is considerable potential for welfare-improving trade in both directions (especially across the land border) that would help reduce seasonal and cyclical disturbances. However, except for the occasional ad hoc relaxation of restrictions, the highly restrictive bilateral trade relationship between the two countries prevents this from happening.

16. The total input subsidy and subsidy rate appeared to have reached a plateau in 2001–05, but, since 2007, there have been large increases in the fertilizer subsidy; the government thus partially insulated farmers from steep rises in world fertilizer prices.

17. We have used only import reference prices in measuring the rates of assistance in manufacturing and aggregating them across manufacturing subsectors. Export reference prices have not been considered directly partly because manufactured exports have constituted a small share of total manufacturing production in India, but principally because the gaps between free on board and cost, insurance, and freight prices and export-import reference prices are generally quite small in the case of the prices for manufactured goods.

18. We cross-checked the resulting NRA series by applying the same price indexes to estimates of the coal protection rates in 1982 derived from an early study. The resulting series was broadly similar, although the NRAs were somewhat lower.

19. We use GDP-share value added weights because they provide a better indication of the relative size of the manufacturing and mining sectors than do output weights. Ideally, to take account of input-output relationships, especially in manufacturing, the effective protection of the two sectors should be averaged in a calculation that relies on the value added in world prices as weights. However, there is only one known estimate of aggregate effective protection in manufacturing (for 1986/87), but there is no time series, and no estimates or time series exist for the mineral subsectors. In our judgment, the use of this procedure—if it were possible to use it—would probably not change the general level or trend of the nonagricultural NRA series much. On the one hand, the average would be reduced, especially for the 1970s and 1980s, owing to the increased weight of the mineral subsectors, but, on the other hand, it would probably be increased owing to the likely excess of effective protection rates over the nominal rates of protection in the manufacturing sector.

20. This does not mean that domestic rice prices would have been an average 23 percent higher without the export ban. This is so because Indian supply would have depressed world prices.

21. It has been suggested that one reason the government set such high agricultural tariffs was the proposal of the United States that applied tariffs rather than tariff bindings should be the starting point for negotiations on tariff reductions (Gulati 2004).

22. Some export subsidies in India have been justified under the World Trade Organization rule that allows developing countries to subsidize the transport and marketing costs of agricultural exports.

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