1 An Overview

INDIAN AGRICULTURE: THE PUZZLE OF PROTECTION AND COMPARATIVE ADVANTAGE

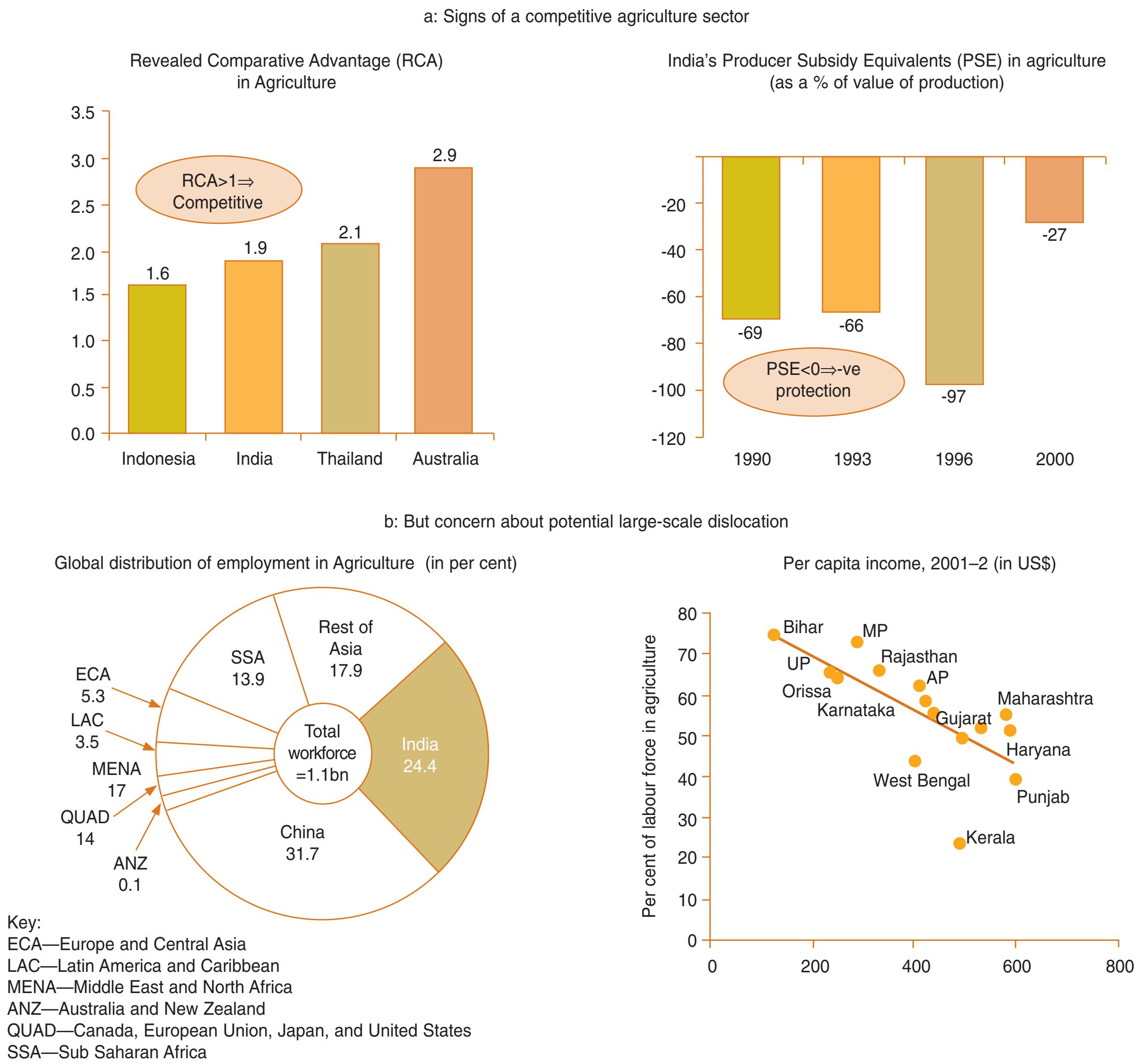
India's agricultural policy presents a puzzle. First of all, there is persuasive evidence that India has an overall comparative advantage in agriculture (Figure 1.1a). Second, government intervention has, in the aggregate, penalized rather than assisted Indian agriculture, even though certain inputs have been subsidized. These two observations suggest that India would take a strong aggressive position in international negotiations, and would push for the elimination of trade distorting policies both abroad and at home. But the truth is quite different: India's efforts have been directed largely towards retaining the right to protect its domestic agricultural sector, and in recent years, tariffs have actually been increased on certain products. Finding the solution to this puzzle is critical to developing a case and a strategy for both domestic reforms and proactive engagement in international negotiations.

The defensive position and actions have traditionally been explained by appealing to the fact that nearly 58 per cent of India's total labour force and 75 per cent of its people below the poverty line derive their livelihood from the agricultural sector (Figure 1.1b), and liberalization could have an adverse effect on these groups. While this broad argument for caution may be valid, it lacks analytical and empirical underpinnings. After all, if the sector as a whole is internationally competitive, and can be expected to expand output in an undistorted world, then that should lead to increased employment and income for those engaged in the sector. The poor can also be expected to benefit from such an outcome, unless we have other reasons to be skeptical about the distribution of benefits from trade.

Part of the solution to the puzzle may lie in two features of Indian agriculture: *heterogeneity* of production conditions and *segmentation* of the national market. Even though India may have a comparative advantage in agriculture as a whole, certain crops, regions, and holdings are not internationally competitive. The heterogeneity has persisted because low productivity regions have been shielded from competition by policy restrictions on, and the high transport costs of, the internal movement of agricultural produce. Given the low level of diversification and the large disparity in agricultural productivity and infrastructure across Indian states, there is concern that greater openness to international trade could involve large-scale dislocation in the sector and significant adjustment costs.

Formulating a strategy that strikes the right balance between efficiency and equity will require considerable information and analysis. It would

Figure 1.1: India's Agriculture Sector



Source: Aksoy and Beghin (2004), Gulati and Narayanan (2003), GEP (2002), and Martin (2003).

involve identifying the crops and the production regions that are already internationally competitive, and the crops and regions that are not, but could be, if certain constraints were overcome through policy reforms. The strategy would also require identification of crops and regions that are inherently uncompetitive, where farmers would have to switch to alternative crops or alternative occupations in the post-liberalization period, and the associated adjustment cost involved in such a transition. Finally, welfare gains from trade liberalization would need to be evaluated under different scenarios, that is, with and without adjustment costs, as well as with and without agricultural reforms in the industrialized countries.

This study addresses some of these larger questions in the context of the Indian horticulture sector. The decision to study the horticultural sector was made (in consultation with India's Ministry of

Commerce) for three reasons. First, the sector is already among the most dynamic in both Indian agriculture and world trade. Shifting food patterns at home and abroad, based on both increased incomes and greater nutritional awareness, are steadily increasing the importance of horticultural production and trade. Second, the problems that confront perishable horticultural products, particularly relating to transportation, represent in a particularly stark form those that affect the Indian agricultural sector as a whole. Finally, the horticulture sector may represent a 'picture of the future' for agriculture as a whole because it is a sector which is less restricted by measures such as subsidies and (arguably) tariffs, but sees an increasing demand for higher standards due to health, safety, and broader quality concerns. Thus the sector encompasses the major challenges that Indian agriculture faces in a world of increasing incomes, tougher delivery schedules, less restrictive conventional trade barriers, and more demanding product standards.

HORTICULTURE: POTENTIAL AND PROBLEMS

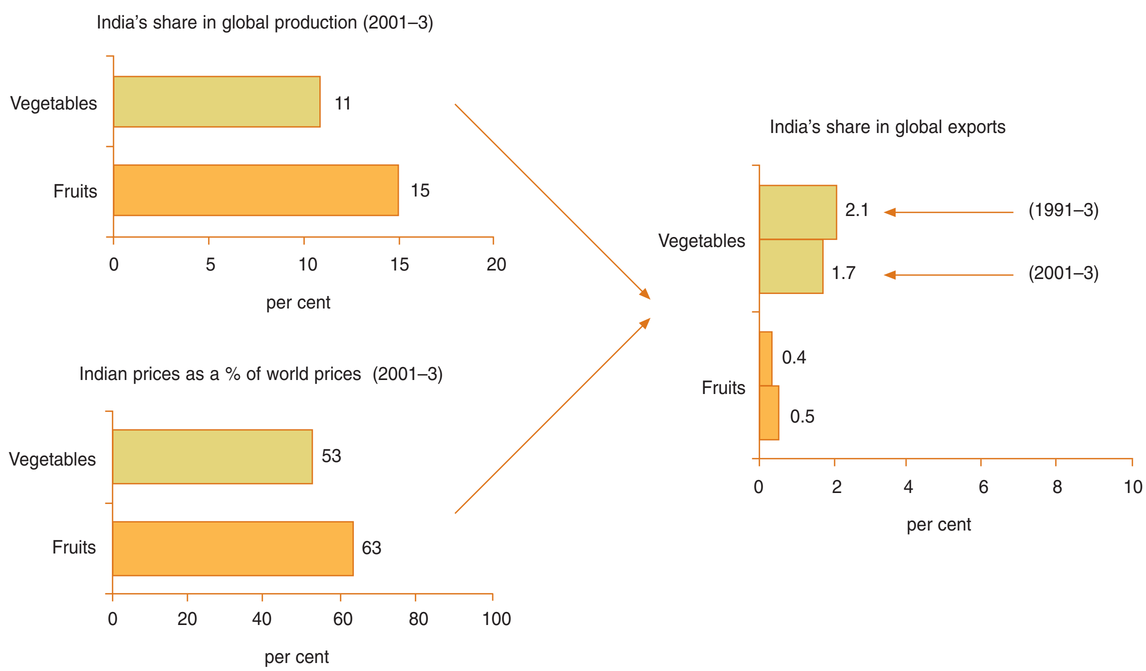
The performance of the Indian horticultural sector in the last decade has provoked dramatically differing assessments.[1] Some have described it as a 'golden revolution', presumably to distinguish it from the earlier 'green revolution' (Bannerjee 2005). Others have dismissed these views as a hyperbolic description of a fundamentally stagnant sector. We find that the truth from a trade perspective is more complex. The sector is beginning to come alive but it faces formidable constraints.

India is one of the largest and lowest cost producers of high value agricultural commodities and yet has a minuscule share in global trade. It produces nearly 11 per cent of all vegetables and 15 per cent of all fruits in the world (Figure 1.2). The unit values of its exports (free on board, FOB) are nearly half the corresponding world unit values. Yet its share in global exports of vegetables is only 1.7 per cent and in fruits a meagre 0.5 per cent. At the same time, its own market is heavily protected. Finding an explanation for this strange conjunction of low costs, low exports, and high protection is vital to any assessment of the competitiveness of Indian agriculture in a liberalized global trading environment.

Many economists and policy makers have, in the past, attributed India's poor export performance to an overvalued real exchange rate and the anti-export bias in its trade policy, the latter being a by-product of the Government of India's (GoI's) broader objective of achieving self-sufficiency and food security in agriculture. The gradual depreciation of the Indian currency since the mid-1980s, the large devaluations in 1991 and 1993, and the subsequent move to a flexible exchange rate regime corrected the overvaluation in the real exchange rate. During the last several years, a number of policies have been initiated to reduce the anti-export bias in India's trade policy. While these reforms have relaxed some of the constraints affecting the horticulture sector, the much anticipated surge in export is yet to materialize. While India's unit value of exports continues to be one of the lowest in the world, its share in global exports in recent years has been less than that in the early 1990s (Figure 1.2).

A complete understanding of India's competitiveness in high value agricultural commodities has proved elusive because the sector has not been subject to an integrated analysis—from farm to retail. Most studies have examined only a single stage of the supply chain, for example, productivity at the farm, efficiency of agricultural markets, or problems associated with poor infrastructure, in isolation of

Figure 1.2: India's Cost of Production and Market Share



Source: UN COMTRADE Statistics, Staff estimates.

the rest of the supply chain. The researchers were not in a position to assess how the problems they identified at the single stage of the supply chain compared with the (unidentified) problems in the rest of the chain.

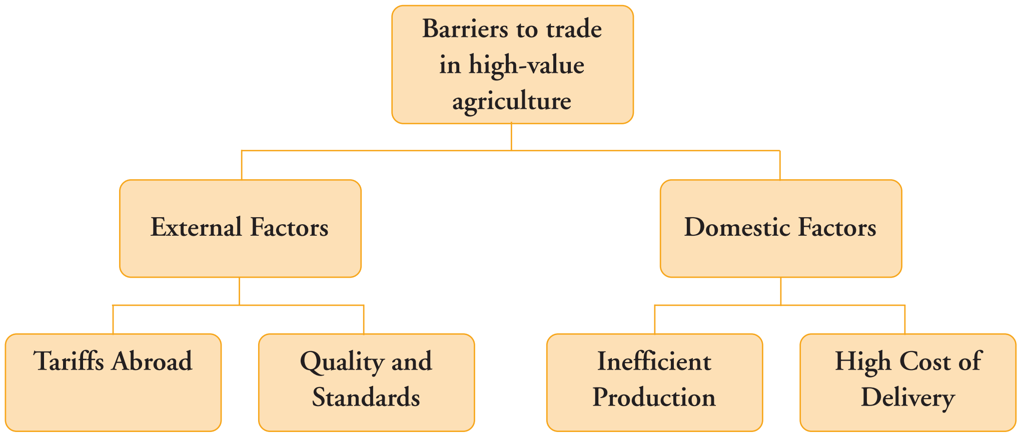
This study undertakes a supply chain analysis of thirteen high value agricultural commodities, based on primary surveys that covered 1400 farmers, 200 commission agents, and 65 exporters across fifteen different Indian states (see Appendix 2 for details). It adds to the existing literature by laying out the cost and price structure of all agents and all markets in the supply chain, thus providing an integrated view of the sector. It becomes possible to analyse the relative importance of the factors that put Indian produce at a disadvantage relative to that from other countries. This framework also enables us to simulate the potential costs and benefits of policy intervention at different stages of the supply chain and thereby help prioritize and formulate policies that would have the biggest impact on India's competitiveness.

WHAT IMPEDES EXPORTS?

The supply chain analysis indicates that from a purely cost perspective the biggest impediments to the competitiveness of India's horticultural exports lie outside the sector rather than inside it (Figure 1.3).[2]

Factors within the agriculture sector are found to have a limited bearing on competitiveness from a trade perspective, with the impact on final price seen to be much smaller than the factors outside the sector. For example, the average price at the farm-gate for a typical horticulture product is found to be only 12–15 per cent of the price at which the

Figure 1.3: Barriers to Trade: External vs Domestic Factors



Source: Bank Staff.

product is retailed in the destination market. This implies that a 20 per cent improvement in yields (which is huge, since yields have increased by only eight percentage points during the last 15 years!) will lead only to a 2.4–3 percentage points reduction in the final price. This is not to understate the importance for Indian farmers of developing better varieties of horticulture products that are internationally more competitive on the quality dimension. Improved agronomics and better technology that can enhance the quality of products in terms of their appearance, size, colour, taste, and shelf-life are of considerable significance if India's horticulture sector is to become competitive both at home and abroad. But since the production-related problems in agriculture are well-known and extensively researched,[3] they do not form the major focus of this study.

India's exports face three major impediments. The first is the 'logistical tax' imposed by high delivery costs which significantly erode the production cost advantage enjoyed by Indian farmers. The second is the gap between the high standards required by governments and buyers, especially in richer countries, and the low standards and weak conformity assessment mechanisms in India. The third problem is the trade policy barriers that Indian exporters face in foreign markets.

Comparing India to selected countries, across destination markets, modes of transport, and commodities traded indicates that, on average, India's international transportation costs are 20–30 per cent higher than those faced by other countries. Since transportation costs are found to account for nearly 45 per cent of retail price when air transport is used and 25 per cent in case of maritime transport, Indian products are 5 to 15 per cent more expensive than their foreign counterparts simply on account of high international transportation costs. Logistical cost is affected by two factors: geographical distance which cannot be remedied and logistical inefficiency which can but has not been remedied. Our estimates suggest that an improvement in the efficiency of the transportation and logistics system (both the domestic as well as the international transport costs) by 20 per cent could reduce final price by as much as twelve percentage points (that is, a saving of Rs 8 on a final price of Rs 62).

Poor quality has two dimensions: weak safety and health standards that legitimize prohibitive SPS barriers imposed by foreign governments; inadequate standardization of products that reduces attractiveness for foreign retailers. Our survey of exporters suggests that Indian products are not perceived to be of lower quality by Indian exporters. Furthermore, many Indian exporters have focused on regional markets and so far there have been limited encounters with the demanding standards of the industrial countries—described as a pattern of 'defensive commercialization' in a recent World Bank study on the impact of standards on horticultural trade. There is clear evidence that stringent industrial country standards have been a prohibitive barrier for some products such as mangoes. In the case of other products such as grapes, exporters have incurred temporary losses due to the rejection of consignments that do not meet standards. In general, producers who have had to make adjustments in response to higher standards have typically incurred significant consignment-specific or recurrent transactions costs. Meeting increasingly high standards will be a critical challenge in expanding exports to more profitable destinations.

Indian exporters face border protection regimes in foreign markets that are opaque, complex, and deceptively protectionist. Among the most pernicious forms of trade protection in horticulture are the systems of: (i) entry prices which discriminate against efficient delivery; (ii) tariff quotas that subjects imports above specified low levels to harsh tariffs; and (iii) SSGs, which are a source of considerable uncertainty for successful exporters. Furthermore, preferential access schemes and tariff escalation discriminate against, respectively, imports from certain sources and more advanced stages of processing. Subsidies in the form of direct payments to producers in developed countries, which have occupied centre stage in agricultural negotiations are, however, less important in horticulture. Given the other serious problems faced by Indian exporters, it is however difficult to establish how far external trade regimes are today a binding constraint on India's export expansion although there can be little doubt that these regimes would be a serious impediment if India were to emerge as a major exporter.

The three factors, tariffs, logistical costs, and quality, interact with each other and have a combined effect that is greater than the sum of the parts. Logistical costs and foreign tariffs penalize exporters multiplicatively, because the latter are imposed on a price that includes the former. Poor logistics (not just as a direct component of costs but through waste and delay) weaken the incentives for producers to improve quality. Limited standardization makes physical inspection a precondition for transactions, creating the need for cross-hauling from producer to regional hubs to consumers, thus adding further to transport costs. Domestic protection can increase the costs of transport for exporters, because low levels of imports imply that exporters must bear the cost not only of the outward journey, but also the unutilized capacity on the inward journey.

WHY ARE DOMESTIC TARIFFS SO HIGH?

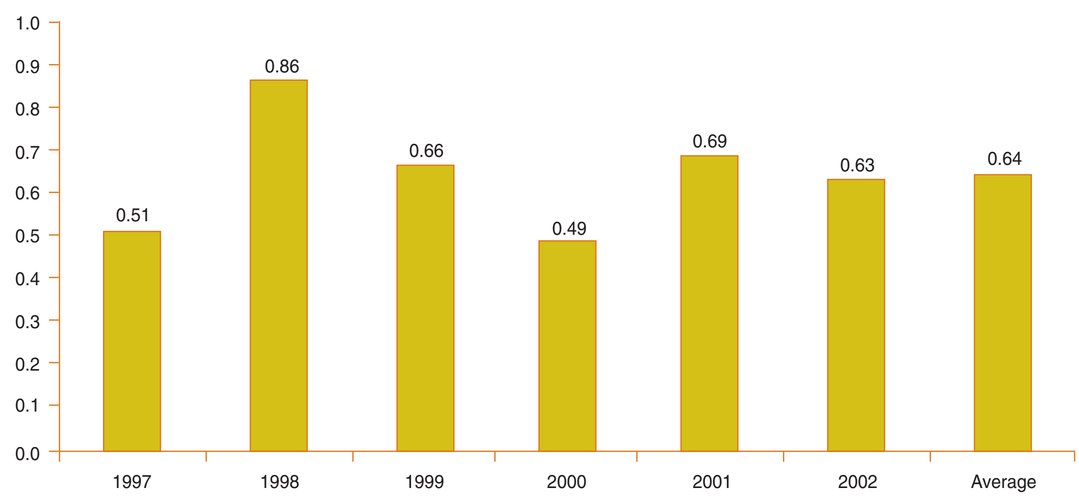
In order to assess the competitiveness of Indian horticulture, we estimated the NPC, which is the ratio of domestic to international prices (appropriately modified to take into account transport and other costs), at the all-India level, both separately and aggregated over all regions and over all months, for the period 1997–2002.

Addressing this question reveals the inadequacy of analyses based solely on aggregative data. For example, data limitations preclude effective control for differences in quality and for fine distinctions between varieties between foreign and domestic commodities. Nevertheless, our results support the findings of a number of previous studies that India's horticulture sector is competitive in terms of prices. As Figure 1.4 shows, the average NPC has been consistently below one between 1997 and 2002; there is some variation across products (discussed in Chapter 3). In the case of bananas, domestic prices on average are consistently less than half the price of imports when they arrive in local markets. Grapes and oranges have slightly higher NPCs, but both appear to be becoming more competitive over time. Apples and mangoes, however, appear to be borderline competitive. For mangoes, the NPC was significantly higher than one only in 1998, though it has been fluctuating close to that level. All vegetables are also competitive except for potatoes in some years.

Why then does India have such high tariffs for even the horticulture products that are clearly competitive? There could be several explanations for this. One is that the tariffs are purely precautionary, and meant to deal with circumstances where foreign suppliers benefit from a sudden reduction in costs, thanks to an act of God or government. However, we find that international unit prices of horticultural products have not displayed much variability, and governments have been remarkably restrained in subsidizing such produce. Another explanation is that the market for a product is not homogeneous but differentiated, either horizontally (that is, foreign and domestic products are different varieties) or vertically (that is, foreign and domestic products are of different quality), in which case the tariff can serve a protectionist purpose. While this explanation cannot be ruled out, our survey of exporters does not suggest that Indian products are significantly inferior to foreign products.

We attach greatest credence to a combination of two explanations: tariffs are intended to protect domestic produce in all regions and all seasons regardless of the variations in prices across space and time; and that the level of tariffs is not always

Figure 1.4: NPCs for Horticulture: All India, 1997–2002

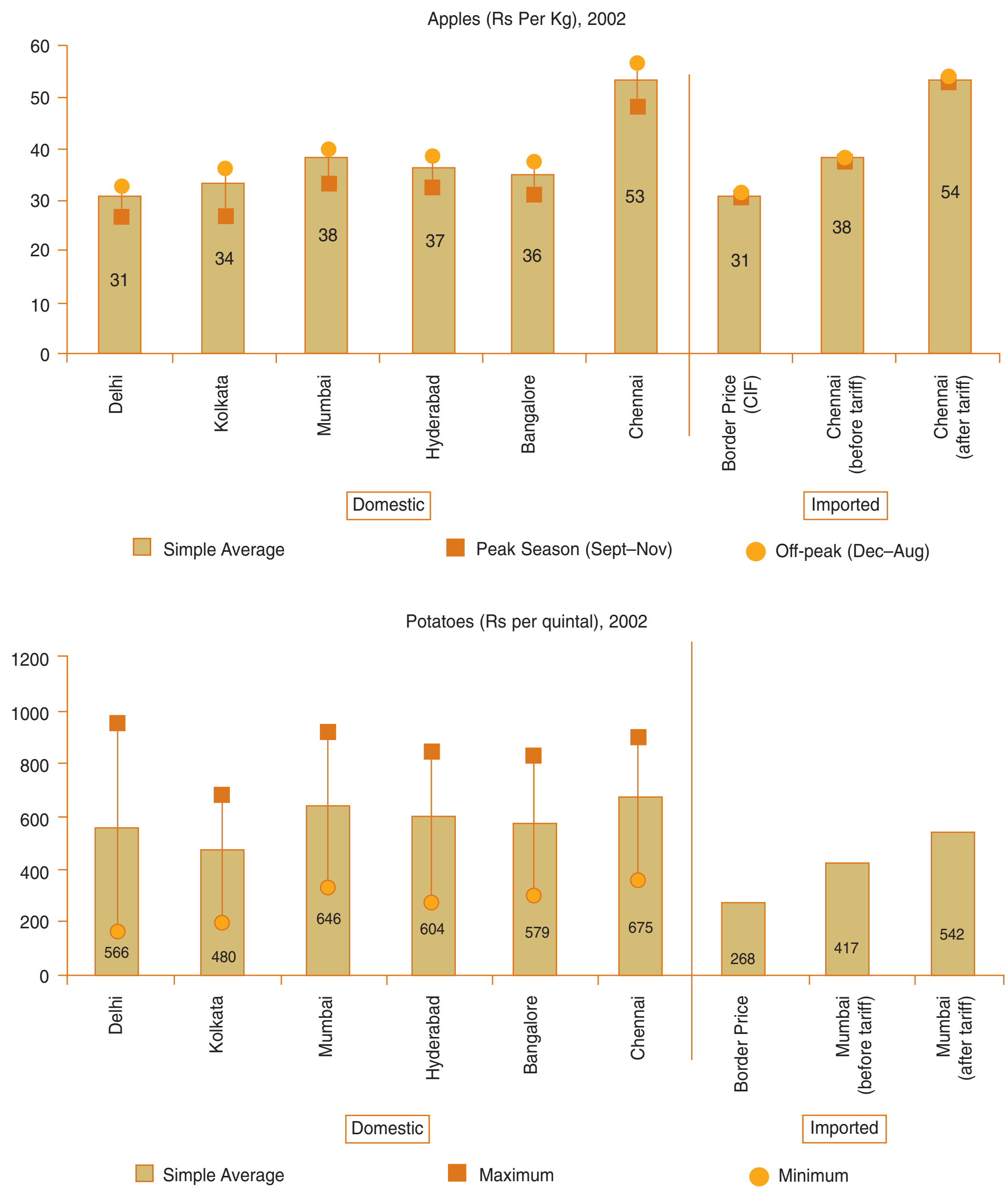


Source: Staff estimates (see Appendix for a discussion of the estimation methodology).

sensitive to the specific current circumstances of individual products, but is set at roughly similar, sometimes historically determined levels for a wide range of products—a form of policy hysteresis.

A better understanding of the aggregate numbers can be obtained by looking at the evidence across regions and over time (Figure 1.5). First of all, we find large regional variations in prices. This is a consequence of the vastness of India, where distances between growing and consuming regions are often quite large. These large distances become even more of an issue because of high domestic transportation costs, and high wastage when commodities are

Figure 1.5: Price Variation across Space and Seasons for Domestic and Imported Apples and Potatoes



Source: NHB Survey, Staff estimates.

moved, due in large part to poor infrastructure and the lack of cold storage infrastructure. Consider the case of apples. The major apple producing areas of the country are located in the north and north-eastern parts of India, and most apple trade happens through Delhi. Domestically grown apples are much cheaper than foreign apples in markets located near these regions. However the high cost of transporting and marketing these in the southern and western regions leads to very high prices in these markets, rendering domestic production uncompetitive. Apple prices in Chennai are almost 70 per cent higher than those in Delhi. Similarly, the largest potato growing states are Uttar Pradesh and West Bengal, together accounting for more than 70 per cent of production. There is a 40 per cent price differential between Kolkata in the east and Chennai in the south. This margin makes imported potatoes relatively more expensive in the north and east, but relatively cheaper in the western and southern regions.

There are also large variations in prices and availability across time because production of many horticultural commodities is seasonal in nature. In India, seasonality effects are further accentuated as storage facilities are both expensive and rare. Still, many of the products considered in our study were found to be competitive, were available throughout the year domestically and not imported at all, and would probably not be imported in large amounts even if tariffs on them were brought down to zero. These include products such as bananas, onions, and tomatoes. But in the case of some products, there were seasons in which prices soared above international levels or availability declined drastically. In Delhi, for example, potato prices ranged from Rs 2.91 per kg to Rs 9.53 per kg in a single year (2002). Regions also differ widely from each other in terms of availability. Apples are available almost throughout the year in Delhi, but are missing from Chennai markets for four months of the year. Grapes are available for eight months of the year in Delhi, but for only five months in Kolkata. In general, availability of fruits and vegetables tends to be better in the north, and worse in the south.

It would clearly be efficient to allow consumers in all regions and at all times to buy from the cheapest domestic or foreign source. Current high tariffs, however, penalize consumers in regions located far from production sources and in seasons far from the harvest season. While the net costs of protection are well understood, it is notable that tariffs restrict imports in places and during times which domestic products find difficult to reach. The existence of tariffs in such circumstances creates an incentive for inefficient transport and inefficient storage. The result is that tariffs hurt consumers, and they subsidize an inefficient distribution and storage system more than they subsidize producers. Therefore, the net welfare loss they create is even larger than usual.

To conclude this overview, the high costs of product delivery are today probably as big an impediment to exports as foreign protection and demanding standards, and could well be a bigger impediment than inefficient domestic farming. They also increase the cost of supplying the domestic market and are probably an important reason for the high protection that is granted to an otherwise competitive sector. A large part of the high costs is attributable to weaknesses in the transport, storage, and marketing infrastructure that only significant public and private investment can remedy. However, costs are also kept unnecessarily high by policy restrictions, particularly those that impede competitive supply of transport and distribution services. Remedying the acute inefficiencies of supporting service sectors will greatly strengthen both the political case and economic gains from further liberalization of Indian agriculture.

NOTES

1. For the purpose of this study, the horticultural sector is defined to include fruits and vegetables, which consist of the following four main categories: (i) fresh fruits; (ii) fresh vegetables; (iii) processed fruits; and (iv) processed vegetables. Fresh vegetables and fresh fruits include products that are only found in Chapters 7 and 8 respectively of the HS Nomenclature while 'processed' fruits and vegetables refer to products found only in Chapters 20 and 21.
2. The barriers to trade mentioned in Figure 1.3 are only a subset of factors affecting India's trade in high-value agriculture. For a more detailed discussion of potential barrier to trade, see World Bank (2005a).
3. See Gulati and Pursell (2003), Gulati, Pursell, and Mullen (2003), Kapila and Kapila (2002), and Umali-Deininger (2004).