

NRPPD Discussion Paper

12

**COMPETITIVE STRUCTURE OF PLANTATION
COMMODITY EXPORTS: INDIA'S TEA AND
COFFEE EXPORTS IN A COMPARATIVE
PERSPECTIVE**

C. Veeramani

2012

**COMPETITIVE STRUCTURE OF PLANTATION
COMMODITY EXPORTS: INDIA'S TEA AND COFFEE
EXPORTS IN A COMPARATIVE PERSPECTIVE**

C. Veeramani

2012

ABSTRACT

A few countries produce most of the world's output of tea and coffee. Therefore, the major exporting countries are likely to exercise market power, which implies that exporters have some control over the prices that they receive. Does India exercise market power in the export markets for tea and coffee or is she simply a price taker? The present paper explores this question by estimating the pricing-to-market (PTM) model for India and other selected exporting countries. The results are generally consistent with the price discriminating behaviour in the export market, which implies that the major exporters indeed hold market power. The analysis suggests significant market power for India and Sri Lanka in 'bulk black tea'. In the case of 'black tea in immediate packing', a more value added category, Sri Lanka exercises a much greater market power than India. That the exporters of plantation products, like tea and coffee, are not passive price takers in the international market but are capable of influencing the prices that they receive is a finding that has important implications for policy. The government may find a strategic motivation for intervening in support of exporters engaged in (imperfect) competition with foreign suppliers. The government and commodity boards may initiate policies and institutional structures (for example, promotion of geographical indication of origin as a tool of product differentiation, innovative marketing, promotional campaigns, branding, labelling, advertising etc) with a view to maintaining and strengthening the market power of Indian tea and coffee in the export markets

1. Introduction

Plantation commodities such as jute, tea, tobacco, cotton, spices etc dominated India's export basket at the time of independence. The dominance of primary commodities in the export basket provided justification to the assumption of "export pessimism" and to the post-independence strategy of import substitution based industrialisation. The well known Singer-Prebisch thesis maintains that the world demands for primary commodities are income and price inelastic, and therefore the productivity gains in the commodity exporting countries are likely to be passed on to importing countries via change in the terms of trade favourable to the latter. It is also held that the primary commodity exporters are price takers in the international markets – implying that they cannot exercise market power – and that the export prospects for primary commodities are determined mainly by the long term pattern of world demand leaving little room for supply-side policies to achieve export success.

The price taker assumption is plausible when the exporter holds a negligible share in the world market. However, in many plantation commodities, world exports are highly concentrated (that is, few countries account for the major shares of the world exports), suggesting the possibility of imperfect competition in the export markets. It is of interest to analyse if the plantation commodity exporters exercise market power. If there is evidence suggesting market power, the usual trade policy implications based on the assumption that primary commodity exporters

are price takers need to be revisited. It may no longer be the case that commodity exporting countries have no control over their export prospects. An exporting country may rather strive to achieve superior performance by adopting active supply-side policies. In particular, the government may find a strategic motivation for intervening in support of exporters engaged in (imperfect) global competition with foreign rivals.

Tests of imperfect competition in international trade can be based on the observed pricing decisions of the exporters. Exporters may exercise market power by adjusting prices to different export destinations, resulting in price discrimination based on pricing-to-market and incomplete pass-through of exchange rate movements to export prices (Krugman, 1987). In a perfectly competitive market, export prices (in terms of domestic currency) do not react to currency movements and there will be complete pass-through of exchange rate changes into the import prices (in terms of foreign currency). However, the pass-through may be incomplete if exporters enjoy market power, which in turn, implies that exchange rates may influence the prices (in local currency) that exporters receive.

A number of empirical studies have analysed the pricing-to-market (PTM) hypothesis that exporters, in order to maintain their competitiveness, may adjust destination-specific prices to the fluctuations in bilateral exchange rates [see Goldberg and Knetter (1997) for a survey]. The PTM model can be used to investigate whether there is any evidence of market power in international trade by analysing the sensitivity of export prices to exchange rate fluctuations. However, the PTM phenomenon has been largely neglected in agricultural trade analysis, particularly in the context of developing countries. Given the high export shares of the tropical countries in some of the plantation commodities, pricing decisions by these exporters should be examined for behaviour consistent with PTM.

The present paper analyses the Indian exporters PTM behaviour in selected plantation commodities – tea, and coffee. A few countries produce most of the world's output of tea and coffee, and therefore the major exporting countries are likely to exercise market power. To put the results for India in a comparative perspective, the analysis of the PTM behavior has been carried out also for selected countries that account for the major share in the export market for each commodity.

The rest of the paper is organised as follows. Section 2 provides a broad overview of the trade policy regime pertaining to India's agriculture sector. Section 3 presents a descriptive analysis of India's export performance in tea and coffee. Section 4 analyses the PTM behaviour of exports for India and other selected countries in each commodity at the disaggregated level. Finally, Section 5 concludes the paper.

2. Agriculture Trade Policy Regime: A Brief Overview

Agriculture, which employs over one-half of India's workforce, is the most important sector of the Indian economy from the perspective of poverty alleviation. India's resource endowments offer tremendous potentials in agriculture production: the country has the world's second largest arable land base (after the U.S) and the second largest irrigated area (after China).

Yet, influenced by the doctrine of 'export pessimism', government policies since independence have sought to insulate India's agriculture from international markets. Over valued exchange rates and heavy industrial protection, during the import substitution period, resulted in a net disprotection of agriculture and a general bias against exports. In spite of the various export promotion schemes adopted in the 1970s and 1980s, profitability in the heavily protected domestic market remained significantly higher than that in the export market (Kathuria, 1996). Overall, the import substitution policies exerted a deleterious effect on exports in general and agriculture production in particular.

The government used a variety of trade policy instruments to control export as well as imports of agricultural products. Non tariff barriers in the form of monopolisation (canalisation) of trade by state enterprises and quantitative restrictions (QRs) have been far more significant than tariffs (Srinivasan, 2000). During the 1950s and 1960s, traditional agricultural exports – tea, coffee, spices and jute – were subjected to export taxes. However, unlike in the case of most agricultural goods, exports of traditional commodities were not subjected to quantitative restrictions.

The process of trade liberalisation since 1991 left India's agriculture sector relatively untouched, except for the removal of export controls in some of the products. In 2001, to comply with WTO rules, India replaced quantitative restrictions on imports of all agricultural products with import tariffs. However, a wide gap between applied and bound tariff rates exists for most of the products. These gaps provide India with the discretionary ability to adjust tariffs creating uncertainty about agricultural trade policy.

It can be seen that, in both tea and coffee, the average MFN tariff rates were as high as 100% in 1990, which were brought down considerably over the subsequent years of the 1990s (Figure 1). However, imports of these commodities were subjected to QRs throughout the 1990s (Mehta, 2000; Goldar, 2005). While the QRs were lifted in 2000 and 2001 (due to India's WTO commitments), the MFN tariff rates were increased significantly during the early 2000s and remained high thereafter. Further, during 1997-2009, the bound tariff rates have been as high as 150% for tea and above 100% for coffee.

India's trade policy with respect to agriculture has been primarily driven by short-term domestic price trends. There is as yet no long-term liberalised trade in agriculture (Srinivasan, 2008). However, it must be noted that, while there have been no significant reforms directly affecting agriculture, the sector was indirectly affected by other macro reforms,

particularly the devaluation of exchange rate and reduction of protection to industry¹.

It is held that that a more realistic market determined exchange rate would make exporting activities more attractive. In 1994, India adopted full current account convertibility making the exchange rate dependent on the demand for and supply of foreign exchange in the market². While a market determined exchange rate may eliminate the bias against exports (including agricultural exports), the fluctuation in the exchange rates may influence the prices that exporters receive for their products. This is the policy context in which we analyze the PTM behavior of Indian tea and coffee exports. As discussed above, exporters may engage in PTM behavior by adjusting the local currency (Rupee) denominated export prices to exchange rate fluctuations.

3. General Trends and Patterns of Exports

3.1. Value, Quantity and Prices of Exports

Using the trade data from the FAOSTAT, the database from the Food and Agriculture Organisation (FAO), Figures 2A and 2B depict the long term (1961-2009) trends in values, quantities and unit values (value divided by quantity) of India's tea and coffee exports, respectively. The quantity of aggregate tea exports from India remains virtually constant throughout the period while the value show a major increase during the

-
1. Thus, reforms may reduce the disprotection to agriculture. Overall, however, agriculture remains disprotected even during the post-reform period (Srinivasan, 2000; Orden et al., 2007).
 2. The government introduced a major downward adjustment in the rupee exchange rate against the major international currencies in July 1991. In February 1992, a dual exchange rate system was introduced, which allowed exporters to sell 60% of their foreign exchange earnings at the free market rate and 40% to the government at the lower official rate. In April 1993, a further move towards the deregulation of the external sector took place when the government adopted full convertibility on trade account by unifying the official exchange rate with the market rate. These steps culminated in India adopting full current account convertibility in August 1994.

second half of the 1970s but recorded cycles in the subsequent years. India exported 205 thousand tonnes of tea in 1961 accounting for 35% of world exports. During the subsequent years, however, the country failed in exploiting the available trade possibilities. Between 1961 to 2009, the quantity of India's tea exports remained, with fluctuation, in the range of 150-200 thousand tonnes. Clearly, lack of world demand is not to be blamed for this stagnation for the world exports of tea increased steadily from 592 thousand tonnes in 1961 to 1775 thousand tonnes in 2009. India's share in world tea exports steadily declined from 35% in 1961 to 13% in 1993 and fluctuated in the range of 10% to 14% since then.

While the export quantity of tea remains constant throughout the period, export quantity of coffee show a broadly increasing trend with some notable sub-period variations. As in the case of tea, the value of coffee exports recorded a major increase during the second half of the 1970s with cycles during the later years. The figures reveal a strong comovement between aggregate export values and unit export values with the simple correlation between the logarithms of the two being as high as 0.94 for tea and 0.84 for coffee. Thus, it is beyond doubt that price (proxied by unit value) is the crucial factor affecting the dollar value of export earnings in the two commodities.

Focusing on the more recent period, Table 1 shows India's average annual growth rates of exports, during 1991-2010, across the major product groups within tea and coffee. The growth rates have been reported for the entire period (1991-2010) as well as for the two sub-periods: 1991-2000 and 2001 to 2010. In general, the second sub-period witnessed a faster growth rates in export unit values compared to the first period in both tea and coffee. Within tea, all the individual product groups (with the exception of 'black tea in immediate packing') experienced relatively higher growth rate in value during the second period, which has been mainly driven by the higher unit values. However,

the higher growth rate of export unit values (about 11% per annum) in 'black tea in immediate packing' did not translate into higher growth rate of value because of negative growth rate in quantity during 2001-2010.

The quantity of coffee exports experienced negative growth rate during the second period. However, this has been compensated by a higher growth rate in unit values and hence the growth rate of value remained mostly unchanged during the second period. Overall, Table 1 confirms the crucial importance of prices in determining the growth of export values in both tea and coffee.

Figure 3A and 3B provides a comparison of India's export prices (proxied by export unit values) with that of the rest of the world in tea and green coffee, respectively. It is clear that the Indian export unit values for tea are generally higher than that of the rest of the world. As far as green coffee is concerned, however, the Indian unit values are marginally lower than that of the rest of the world³.

Table 2 presents a disaggregated profile of unit values for India and rest of the world across different product groups within tea. The picture that emerges from the aggregate behaviour of export prices, as shown in Figure 3A, is reflected in the behaviour of prices across most of the product groups. In general, India's export unit values are higher than that of the rest of the world (except in the case of 'black tea in immediate packings')⁴. In particular, India's unit value realisation is significantly

-
3. Indian unit values are generally lower than that of the rest of the world in the case of coffee extracts as well (these values are not reported in the interest of space).
 4. In the case of 'extracts of tea / mate', the estimates of unit values are influenced by the difference in the composition of exports from India and the rest of the world. Note that this category includes 'mate', which is considerably cheaper than tea. Thus, the unit values in this category are downward biased for the rest of the world due to the higher share of mate tea in the export of this category from the rest of the world than from India.

higher than the rest of the world in ‘green tea in immediate packings’⁵. In terms of the average annual growth rate of unit value realisation, during 1993-2010, India’s growth rates are higher than the rest of the world in ‘green tea in immediate packings’ and ‘black tea in immediate packings’. In the case of other categories, the growth rates are similar for India and rest of the world.

The comparison of export prices shows that as expected the Indian prices and world prices generally move together. However, in general the Indian tea has been fetching a premium in the international markets while her export prices of coffee are generally lower than the world prices. India’s lower unit value of coffee is not surprising since the relatively lower-priced Robusta variety (rather than the higher-priced Arabica variety) constitutes the larger share of India’s coffee exports. In general, the possibility of exercising market power is higher if exporter fetches a price premium due to product differentiation or other factors.

3.2. World Market Shares

The extent to which an exporter can exercise market power may depend, *inter alia*, on the world market shares of the exporter in the commodity under consideration. Figure 4A shows the changes in the world export market shares of India in tea and coffee. During the first half of 1960’s (i.e., 1961-64), India accounted for about 37% to 39% of the world export values (in US\$) of tea, but her share had declined significantly during the second half (1965-1969) with India accounting for only 28% of world market share in 1970. India’s share remained above 25% until 1977. However, except for a relatively better

5. The unit value realisation in ‘green tea for immediate packing’ is generally higher than that in ‘green tea, bulk’ both for India and World. This is expected since the former is a higher value added item compared to the latter. However, since 2003, the price gap has increased significantly for India and it may be important to analyse the factors responsible for this growing gap. This issue assumes particular importance in the context of the assertion that a few big firms with established brand images in the packet segments appropriate a disproportionately higher share of the total value addition in tea and coffee (George and Joseph, 2005).

performance in two years (1980 and 1981), the country's share fluctuated in the range of 19-25% during the period 1978-1991. India's world market share had been in the range of 13-16% during 1992-2001 and further declined in the range of 10-12% during 2002-2009. The long term trend clearly shows a marked decline in India's share of world tea exports. Nevertheless, in terms of volume, India remains as one of the major tea exporting countries of the world.

The FAOSTAT provides trade data at the disaggregate level for coffee but only at the aggregate level for tea. Therefore, we make use of the disaggregated data pertaining to tea exports (at the 5-digit level of SITC Rev 3) from the UN-COMTRADE database⁶. Figure 4B shows India's world market shares of four different product groups belonging to tea. It is clear that the market share of 'bulk black tea' (SITC 07414), the major export item from India, remains more or less constant throughout the period 1993-2010. Other items ('black tea in immediate packings', 'tea/mate extracts' and 'green tea') are responsible for the decline in India's aggregate market share from about 12% in 1993 to 10% in 2010.

Compared to tea, India is a minor player in the world export market for coffee. However, the long term trend indicates slow but definite increase in India's world market share of coffee exports⁷. During the

-
6. While estimating the value of world exports, it is important to keep in mind that the number of countries that report data to the UN vary from year to year. In order to make sure that the world export values are strictly comparable overtime, we must use data from a consistent set of reporting countries. We use 'mirror export data', which has been constructed on the basis of imports reported by different countries. The 'mirror data', rather than own country reported data, has been used because some of the major tea exporting countries do not report data consistently for all the years. It has been noticed that import data according to SITC Rev 3 is available for a consistent set of 67 countries for every year in the period 1993-2010.
 7. Though India's world market share of coffee is significantly less than that of tea, the share of the former in India's aggregate export value of the two commodities has been growing considerably overtime. During 1962-72, the average share of coffee in the aggregate export value of the two commodities was about 10%, which was increased to 28% during 1973-1993 and further to 46% during 1994-2009.

period 1961-72, India's share remained broadly constant in the range of 0.8% to 1.2% (Figure 4A). During 1973-1979, the country's share marginally improved but fluctuated in the range of 1.2% to 1.6%. A further increase to about 2% can be noticed during the early 1980s (i.e. during 1980-82), but then the share was declined and remained mostly below 2% until 1992. The first half of the 1990s witnessed a significant increase in India's market share. The share has been declining since 1995 but remains above 2% for most of the years.

Figure 4C depicts the changes in the market shares of different items within coffee. India's market shares in 'green coffee' and 'coffee extracts' show a general increasing trend over the years with relatively greater fluctuations in the latter category. Since 1992, India's market share in the higher value added coffee extracts has been higher than that in green coffee. The share of the former in the value of India's total coffee exports increased steadily from about 10% in 1995 to as high as 36% in 2009. India's world market share in roasted coffee remains negligible throughout.

Table 3A reports the shares of the leading exporting countries in the total world exports of different product groups within tea (disaggregated at the 6-digit Harmonised System (HS) level)⁸. The world markets shares of the leading exporting countries are reported for 1996 and 2010⁹. The leading exporters have been identified as those having at least 0.5% of the total world exports of the particular 6-digit category in 2010.

8. The world export has been estimated using mirror data of a consistent group of 91 countries that had reported import data, according to HS nomenclature, both for 1996 and 2010.

9. The year 1996 has been selected to make sure that Russia, a major importer of tea, is included in the set of countries whose mirror data are used for estimating the world exports. The year 1996 is the earliest year for which Russia's import data are available.

It is evident that India ranks as the third largest exporter of black tea (HS 090230 and HS 090240) in the year 2010. Within the category of black tea, Kenya accounts for the largest world market share in HS 090240 (bulk black tea) followed by Sri Lanka while the latter accounts for the largest share in HS 090230 (black tea in immediate packings) followed by UK. As far as green tea (HS 090210 and HS 090220) is concerned, China is the leading exporter while India is relatively a smaller exporter. It is evident that the developed countries (USA, Ireland, Canada and Germany) are the dominant exporters of the more processed and higher value added category of ‘tea extracts’ (HS 210120).

Table 3B presents the world market shares of different countries in the two major 6-digit level categories within coffee, namely HS 090111 (‘coffee, not roasted or decaffeinated’/‘green coffee’), and HS 210110 (‘coffee extracts’). It is evident that India is relatively a small player in the world market for coffee in all categories, including ‘green coffee’. The leading exporters of HS 090111 include Brazil, Columbia and Vietnam. In 2010, these three countries accounted for 53% of world export in this category while India’s share was just 2%. Developed countries dominate the export markets for the more processed and higher valued added HS 210110. Just 4 developed countries (Switzerland, Germany, Netherlands and France) account for one-half of the world export in this category while India’s share is a paltry 0.8%.

India’s market shares in other 3 product groups within coffee (HS 090112, HS 090121, and HS 090122) are negligible (much below 0.5%). Developed countries dominate the export markets in these relatively higher value added product groups¹⁰.

10. The world market shares of different countries in these categories are not reported. In 2010, just 2 countries (Germany and Spain) account for 51% of the world market share in HS 090112 (decaffeinated coffee, not roasted); 4 countries (Switzerland, Germany, Italy, USA) account for 60% in HS 090121 (roasted coffee, not decaffeinated), 5 countries (Switzerland, Canada, Germany, Italy and USA) hold 75% share in HS 090122 (roasted decaffeinated coffee).

3.3 *Composition and Direction of Exports*

Table 4 shows the changes in the composition of India's tea and coffee exports. Black tea accounted for 97% of India's total tea exports in 1991, and this share was declined to 92% in 2010. Within black tea, the share of bulk tea declined from 64% in 1991 to 50% in 2001 and then increased significantly to 79% in 2010. It is evident from Table 1 that the decline in the share of 'bulk black tea' in 2001 is primarily due to the negative growth rate in export quantity during 1991-2001. The subsequent increase in the share of this item in 2010 has been driven by higher growth rate in unit value and quantity during 2001-2010. The share of the relatively higher value added 'black tea in immediate packing' declined from 46% in 2001 to 12% in 2010, which is entirely due to the negative growth rate in quantity during this period. The shares of green tea show some marginal increase over the years, driven by the growth rate in unit value as well as quantity.

Within coffee, HS 090111 ('coffee, not roasted or decaffeinated') accounts for 88% of total exports in 1991, but its share had declined gradually to 66% in 2001 and then marginally increased to 69% in 2010. Correspondingly, the share of HS 210110 ('coffee extract and essences') increased its share from a paltry 4% in 1991 to 33% in 2001 and then marginally declined to 30% in 2010. The significant increase in the export share of this category had been brought about by an impressive growth rate in quantity (about 32% per annum) during 1991-2000.

The changes in the destination of India's exports across the major product categories are shown in Table 5. In 2010, Southern and Western Europe accounts for about 2/3rd of India's exports of HS 090111 ('coffee, not roasted or decaffeinated'). However, the share of Western Europe has been declining over the years while the share of Southern Europe has been increasing consistently. Other leading markets for India in this product group include Western Asia and Eastern Europe.

In general, India's export markets for tea are more diversified than for coffee. In the case of HS 090240 (bulk black tea), the major markets for India include different regions in Europe, and Southern & Western Asia. The increasing importance of Western Asia as a market for Indian tea and coffee is a notable development. It may also be noted that while Southern Europe accounts for the major share in India's coffee exports, its share in tea is negligible.

Table 5 also reports the values of India's trade intensity indices with different regions and across the different product groups. The trade intensity index is defined as: $TI = S_{jk} / S_{wk}$

where s_{jk} denotes the share of destination k in country j 's (India in our case) total exports and s_{wk} represents the share of destination k in the total exports from the rest of the world (w)¹¹. Thus, the TI index is a ratio of two shares. The value of the index indicates whether or not India exports more to a given destination (region or country) than the world does on average. A value greater than one indicates an 'intense' trade relationship of India with the given destination and in the given product group while a value less than one would imply opportunities for trade expansion with the given destination. The index has been computed using the mirror data (bilateral import) of 91 countries that had consistently reported import data both in 1996 and 2010.¹²

It is evident that in the case of HS 090111 ('coffee not roasted or decaffeinated'), India holds an intense export relationship with Southern Europe, Western Asia and Australia & New Zealand, and increasingly so. In 1996, India recorded the highest trade intensity with Eastern Europe, but this has declined considerably during the subsequent years.

11. The trade intensity index has been used in a number of studies. See, for example, Drysdale and Garnaut (1982).

12. The number of countries reporting the data varies from year to year. It is important to use data from a consistent set of countries so that the results are not sensitive to the reporting patterns.

India's trade intensity with most regions in Asia (except Western Asia), Africa (except Northern Africa) and America is relatively small. Thus, there exists some potential for intensifying exports to these regions.

In the case of HS 090240 (bulk black tea), India holds intense export relationship with different regions in Europe (East, West and North). However, the trade intensity with these regions, especially Western and Eastern Europe, has been declining over the years. It is important to reverse this trend as well as to diversify into other markets in Asia, America and Africa. In the case of HS 090230 (black tea in immediate packing), the TI index show greater changes in India's export market orientation. In 1996, India recorded a TI value of greater than one with just one region (Eastern Europe). However, TI index was greater than one with as many as six regions in 2010 (Australia & New Zealand, Eastern Asia, North America, South-Eastern Asia, Southern Africa, Western Asia). As far as HS 090220 (bulk green tea) is concerned, India's trade intensity is generally high with Western Asia, Western Europe, Northern America and Northern Europe.

4. Pricing to Market Behaviour

The analysis in Section 3 shows that the movement in prices is the key factor that determines the long term trends in export revenue. For example, as evident from Figure 2A, the quantity of tea exports remained more or less constant for nearly five decades, while the value of exports fluctuated depending upon the movements in prices. A strong long term correlation between prices and exports values has also been observed in the case of coffee. Therefore, it is important to analyse the pricing behaviour of India's tea and coffee exports. Using the PTM model, we analyse some specific questions as follows.

First, does India exercise some market power in the export markets for tea and coffee or is it simply a price taker? Second, compared to India, do other major exporting countries behave differently or similarly?

Third, does the extent to which a country exercises market power vary with the level of processing or value addition of the commodity? It is important to ask these questions because the usual policy implications based on perfectly competitive market structure should be modified if we find evidence in support of the PTM behaviour.

There are at least two reasons to expect the PTM behaviour in commodities such as tea and coffee. First, it is well known that these commodities are differentiated by the country of origin in terms of several attributes (such as variety, plucking method, fermentation, processing, taste and the form in which it is sold). Second, the world market for these commodities are characterised by a high degree of export concentration by a handful of countries.

In what follows, we first sets out the PTM model and then empirically test it to understand the pricing behaviour by India and other major countries in three major export categories from India: ‘bulk black tea’ (HS 090240), ‘black tea in immediate packing’ (HS 090230), and ‘coffee, not roasted or decaffeinated’ (HS 090111). The analysis has been carried out for India and two other leading exporters in the respective category – that is, Kenya and Sri Lanka for HS 090240, United Kingdom and Sri Lanka for HS 090230 and Brazil and Columbia for HS 090111. It can be seen that the selected countries account for the largest shares in the world exports of the respective category (Table 3A and 3B).

4.1. The Model

The competitive structure of a market can be analysed based on the extent of pass-through of changes in the exchange rate to import prices. If the export market is perfectly competitive, prices (P) will be equal to marginal cost (MC), and there will be complete pass-through of exchange rate movements into import prices. For example, suppose that the exchange rate of dollar got appreciated from INR 40 per US \$1 in period one to INR 50 per US \$1 in period two. Suppose further that

Indian exporters had received INR 80 per kilogram of tea exported to the U.S. in period one. Ignoring transport costs and trade barriers, the price of tea in the US market would have been \$2 (=INR 80) in period one. What will be price of the Indian tea in the US market in period two? Complete pass-through implies that the US market price will decline to \$1.6 (=INR 80) in period two. This means that, if the market is perfectly competitive, the exporter does not react to currency movements (that is, the export price in INR remains constant). However, there will be incomplete pass through if the export market is imperfectly competitive (i.e., $P > MC$) and the exporter enjoys market power. In such cases, exporters adjust the markups over MC to accommodate changes in exchange rates.

The idea that the exporter can adjust destination specific markups to accommodate changes in exchange rates was termed PTM. The PTM model is connected to the notion of mark-up pricing over MC (and thus imperfect competition) and tests whether an exporting country can differentiate export prices according to the conditions in each importing country.

The PTM model proposed by Knetter (1989) and Goldberg and Knetter (1997) can be used to distinguish between a competitive market and two alternative models that are consistent with imperfectly competitive behaviour. The exporter is assumed to export to N different markets with individual import demand in each market, $i = 1 \dots N$, expressed as:

$$(1) \quad q_{it} = f_i(s_{it}p_{it})v_{it},$$

where q_{it} is the quantity demanded in importing country i in year t ; p_{it} is export price to market i in the exporter's currency in year t ; s_{it} is the exchange rate in time t (units of the importer's currency per unit of the exporter's currency), and v_{it} is a demand shifter. The cost structure for the exporter is a function of the total quantity exported and a cost function shifter δ_t :

$$(2) \quad C_t = C \left(\sum q_{it} \right) \delta_t$$

Given (1) and (2), the profit maximisation problem is:

$$(3) \quad \text{Max } \pi = \sum_{i=1}^N (p_{it} q_{it}) - C_t$$

The first order condition for profit maximization implies that the firm equates the marginal revenue from sales in each market to the common MC. Alternatively, the export price to each destination market is the product of the common marginal cost and the destination specific markup:

$$(4) \quad p_{it} = c_t \left[\frac{-\eta_{it}}{-\eta_{it} + 1} \right] \text{ for all } i = 1, \dots, N, \text{ and } t = 1, \dots, T ;$$

where c_t is the exporter's common MC in year t , and η_{it} is the absolute value of the elasticity of demand in the destination market with respect to changes in price. Expression (4) represents the optimal profit maximising conditions for the price-discriminating monopolist, equating MC to marginal revenue in each market.

When the exporter behaves as a perfect competitor, demand elasticities are infinite, and do not vary across destinations. Then, prices are equal to marginal cost ($p_{it} = c_t$) and do not vary across destination markets. But, if the market is imperfectly competitive, elasticities are finite and can vary across importing countries and hence the exporter may practice price discrimination. In general, prices in the relatively inelastic markets will be higher than that in the elastic market.

In this model, with imperfect competition, the response of the export price to the change in exchange rate depends on two factors: (i) any change in MC and (ii) the changes in the demand elasticity with respect to the change in price (i.e., $\partial \eta_{it} / \partial p_{it}$). The former channel will affect prices to all destination markets, while latter may be destination-specific.

For the empirical analysis of the PTM model, Knetter (1989) proposes the following fixed-effects regression of export prices across destinations for a given commodity.

$$(5) \quad \ln p_{it} = \theta_t + \lambda_i + \beta_i \ln s_{it} + u_{it} ,$$

where p_{it} is price in units of the exporter's currency measured at the port of export, θ_t is the time effect, λ_i is the destination country effect, and u_{it} is the error term. This model can be used to distinguish between different pricing behaviour under alternative market structures.

In a competitive and integrated world market, the export prices to all destinations must equal a common MC. In the regression model, the time effects captured by θ_t will measure the common price in each year, which is a measure of MC. This hypothesis implies that λ and β are zero for all destinations since all the export prices are equal. Changes in the bilateral exchange rates will not affect bilateral export prices.

However, when markets are imperfectly competitive and price discrimination is possible, two alternative scenarios are plausible depending upon the change in the demand elasticity with respect to the change in price. First, assume that each destination market is characterised by constant elasticity of demand with respect to the domestic currency price (i.e., $\partial\eta_{it}/\partial p_{it} = 0$). Under this scenario, price charged to each destination market is a fixed mark up over marginal cost (the markup is fixed because of constant elasticity of demand). Because the elasticity of demand is destination-specific, export price may vary across destinations, implying $\lambda \neq 0$. However, since demand elasticities do not vary in response to price changes, shifts in bilateral exchange rates do not affect export prices, implying $\beta = 0$ for all destinations.

Second, under the assumption of varying elasticity of demand, (i.e., $\partial\eta_{it}/\partial p_{it} \neq 0$) prices would still vary across destinations ($\lambda \neq 0$). Further, bilateral exchange rate changes would affect export prices

because demand elasticities can either increase or decrease as a result of changes in price. Consider a depreciation of the importer's currency relative to the exporter currency. The price faced by the domestic consumers in the importing country then increases. If the demand elasticities remain constant, the first scenario discussed above will happen (i.e., $\beta = 0$ and $\lambda \neq 0$). However, if demand elasticities change, then the optimal mark up over marginal cost will change and export price will thus depend on exchange rates. This scenario is referred to as PTM because the optimal markup by price discriminating monopolist will vary across destinations and with changes in bilateral exchange rates, which implies that $\lambda \neq 0$ and $\beta \neq 0$.

4.2. Data

Equation (5) has been estimated for each of the two categories of tea ('bulk black tea' and 'black tea in immediate packings') and one category of coffee ('coffee not roasted or decaffeinated'). Bilateral export data on quantities and values, at the 6-digit HS level, by India and other selected countries on an annual basis have been used to estimate prices (unit values), p_{it} . The prices are on f.o.b (free on board) basis, which exclude the cost of loading or any other charges or transportation costs beyond the port of exportation. For each of the selected product category, separate regression analysis has been carried out for India and two other countries that account for the largest shares in the world exports of the given product category. The regression analysis for each exporting country covers their major markets – that is, those countries that account for an average annual share of at least 0.5% in the total export of the given category by a country during the five year period 2006-2010¹³.

13. Note that the lists of importing countries are not uniform for all the exporting countries - each exporting country has its own list of the major markets though there exists a considerable overlap.

Nominal exchange rates have been obtained from the IMF's International Financial Statistics, which have been converted into real values by using the importing country's CPI as deflator. For each commodity a pooled cross-sectional-time series model was specified with $T \times N$ observations. There are $T-1$ time dummy effects (θ_t) and $N-1$ country dummy effects (λ_i). For estimating λ_i , we chose to exclude a given country (Egypt) in all the regressions¹⁴. The β coefficients have been estimated for each of the importing countries, included in the regression analysis. The period of analysis for India is 1988-2009 but varies for other countries depending upon the availability of data at the 6-digit HS level.¹⁵

4.3. Regression Analysis

Table 6A summarises the results for 'bulk black tea' (HS 090240) for the three major exporting countries – India, Kenya and Sri Lanka – in this category. It may be noted that these three countries together accounts for more than 60% of the total world exports in this category in 2010, with the shares of the individual countries being 26% for Kenya, 18% for Sri Lanka and 17% for India (see Table 3A). Table 6A reports the country effects (λ_i) and the exchange rate coefficients (β_i). The time dummies are included in all the specifications, but, in the interest of space, their coefficients (θ_t) are not reported.

-
14. This choice is arbitrary. Egypt has been in the list of the major markets for the Indian export of tea and coffee. However, for the sake of comparison, Egypt has been included arbitrarily in the regressions for other exporting countries as well whether or not it is a major market for the given exporting country.
 15. 1988 is the earliest year for which data are available according to the HS nomenclature. Note that in all regressions we have used the own-country reported data since the export prices must be on f.o.b. basis. The mirror data is not appropriate for the present purpose since imports are recorded on c.i.f basis and therefore the prices will include the cost of transportation, insurance etc.

A significant relationship between export prices and the bilateral exchange rate implies a rejection of the constant elasticity model. A negative coefficient of bilateral exchange rate implies that the exporting firms adjust prices in export markets to offset local exchange rate movements. Positive coefficients imply that exporters adjust prices upward as the local currency appreciates, exacerbating the impact of exchange rate movements.

Overall the results in Table 6A, particularly for India and Sri Lanka, reject the perfect competition as well as the constant elasticity model. The results suggest that India and Sri Lanka exercise market power and engage in price discriminating behaviour in the export market for 'bulk black tea'. For India, the exchange rate coefficient differed significantly from zero at the 1% level for eight markets (USA, France, Netherlands, Australia, Pakistan, Kenya, Kazakhstan and Russia) at the 5% level for Germany and at the 10% level for Afghanistan. The β_i coefficient values are negative and significant for five markets and positive and significant for the remaining five. The table also show statistically significant country effects for India with respect to six of its markets for 'bulk black tea'.

The results for Sri Lanka provide even stronger support for its market power and price discriminating behaviour in the international market for 'bulk black tea'. These results suggest that the bilateral exchange rate coefficient is statistically significant for ten countries (Japan, Finland, Iran, Iraq, India, Kuwait, Saudi Arabia, Syria, Hong Kong and Tunisia) and there are as many as twelve country effects that are significantly different from zero.

The results pertaining to Kenya, however, are significantly different from that of India and Sri Lanka. Only three exchange rate coefficients and three country effects are significantly different from zero for Kenya. Overall, the results suggest a lower extent of market power being exercised by Kenya in the international market for 'bulk black tea' compared to India and Sri Lanka.

It may be noted that black teas are processed in either of the two ways, CTC (Crush, Tear, Curl) or orthodox. While India and Kenya mainly produce the CTC variety, Sri Lanka specialises in the orthodox variety. Kenya's relatively low market power could be related to the fact that the domestic market for tea in that country is very small and that it depends hugely on the export market to sell the produce. While close to 100% of the tea produced in Kenya is being exported, the share of exports in India's total production is only 20%.

Therefore, compared to Kenya, the large domestic market may provide India with a greater leverage in the international markets, which, in turn, may enable the latter to exercise greater market power than the former in the CTC variety of black tea. Sri Lanka, however, has been able to exercise high market power despite its small domestic market and its high dependence on the export market. This high market power of Sri Lanka could be due to its concentration on the production of orthodox tea, which enhances its quality image, as most of quality teas are produced by the orthodox method (Ali et al 1997).

Table 6B show the results for the relatively more value added 'black tea in immediate packing' (HS 090230). In terms of world market share, the leading countries in this category are Sri Lanka (25%), followed by U.K (19%) and India (9%), and the regression analysis has been carried out for these 3 countries. The results again provide strong support for the PTM behaviour by Sri Lanka. Both exchange rate and country effects are significantly different from zero for as many as 18 destination countries of Sri Lanka. In contrast to this result, the number of significant coefficients for India is few; the exchange rate coefficient is significant in seven cases while the country effects are significant only in two cases. The U.K. also does not seem to be exercising as much market power as does Sri Lanka.

India's low market power compared to Sri Lanka in this category is consistent with some observations. First, as noted above, Sri Lanka

specialises in orthodox tea and most of the premium quality teas in this category (HS 090230) are produced by the orthodox method while India mainly produces the CTC variety. Second, unlike in other categories within tea, India's unit value realisation in HS 090230 has been generally lower than that of the rest of the world (see Table 2). Third, Sri Lanka remains as the world leader in this category, with 25% of the world market share, while India's world market share has declined significantly from 19% in 1996 to 9% in 2010 (see Table 3A).

We now turn to discuss the results for 'coffee, not roasted or decaffeinated' (HS 090111), which is the major category of coffee exported from India. In 2010, Brazil accounted for 30% of the world exports in this category followed by Colombia (12%) and Vietnam (11%). Compared to the major exporters, India's world market share in this category is small (2%).

Considerable differences exist with respect to the varieties of coffee exported by different countries. Broadly, there are two important types of coffee that can be distinguished, namely Arabica (which accounts for the major share of the world production) and Robusta. The best known varieties of Arabica are Unwashed Arabicas (mainly from Brazil), Colombian Mild Arabicas (mainly from Colombia), and other Mild Arabicas (mainly from other Latin American countries), whereas Robusta coffee is mainly grown in African countries and South-East Asia (see Otero and Milar, 2001). India exports both the varieties with the share of Robusta variety being higher.

The results of the regression analysis, carried out for India, Brazil and Colombia, are reported in Table 6C. Overall, the results provide evidence in favour of the PTM hypothesis for India and Colombia, but surprisingly the evidence is weaker for Brazil. The regression for India yield significant β coefficient in the case of 10 countries (USA, Belgium, France, Italy, Netherlands, Norway, Switzerland, Israel, Jordan, and Libya). The country effects are also significant in most of these cases.

The β coefficients are negative and significant in the case of nine destinations for Columbia. By contrast, the number of significant β coefficients for Brazil is just three and the number of significant country effect is just one.

Despite India being a relatively small player in the international market for coffee, we find that the country is able to exercise significant market power. This may suggest that India has been able to differentiate its product by marketing its shade-grown 'mild' variety of coffee and create a niche for itself.

5. Conclusions and Policy Implications

Descriptive analysis of India's export performance in tea and coffee shows that the movements in prices is the key factor in determining the long term trends in export revenue. Therefore, it is important to analyse the dynamics of price formation in the international markets for these commodities. A few countries produce most of the world's output of tea and coffee. Therefore, the major exporting countries are likely to exercise market power, which implies that exporters have some control over the prices that they receive.

Exporters may exercise market power by adjusting prices to different export destinations, resulting in price discrimination based on pricing-to-market and incomplete pass-through of exchange rate movements to export prices. This pricing-to-market (PTM) behaviour pertains to decisions by exporters to maintain or even increase export prices when facing currency depreciation relative to the importers currency.

The important question that we have addressed in the present paper is: Does India exercise market power in the export markets for tea and coffee or is she simply a price taker? To put the results for India in a comparative perspective, the analysis had been carried out also for selected countries that account for the major shares in the export market for each

commodity. We empirically tested the PTM model to understand the pricing behaviour by India and other major countries in three major export categories: 'bulk black tea' (HS 090240), 'black tea in immediate packing' (HS 090230), and 'coffee, not roasted or decaffeinated' (HS 090111).

The regression results are generally consistent with the price discriminating behaviour in the export market, which implies that the major exporters indeed hold market power. The analysis suggests significant market power for India and Sri Lanka in 'bulk black tea'. In the case of 'black tea in immediate packing', a more value added category, Sri Lanka exercises a much greater market power than India. Though India does not hold a major share in the world export of coffee, our results provide evidence in support of India practicing price discrimination in 'coffee, not roasted or decaffeinated', which is the major export category from India.

The major policy implications that may be derived from the results reported above are summarised below.

(i) That the exporters of plantation products, like tea and coffee, are not passive price takers in the international market but are capable of influencing the prices that they receive is a finding that has important implications for policy. The usual trade policy implications based on the assumption that primary commodity exporters are price takers need to be revisited. It is no longer the case that commodity exporting countries have no control over their export prospects. Instead the governments in the exporting countries can strive to achieve superior performance by adopting active supply-side policies.

(ii) Since the international markets for plantation commodities are characterised by imperfect competition, the government may find a strategic motivation for intervening in support of exporters engaged in global competition with foreign suppliers. The government and commodity boards may initiate policies and institutional structures (for example, promotion of

geographical indication of origin as a tool of product differentiation, innovative marketing, promotional campaigns, branding, labelling, advertising etc) with a view to maintaining and strengthening the market power of Indian tea and coffee in the export markets.

(iii) That the companies from the exporting countries are able to exercise market power, however, does not necessarily mean that the small growers in these countries have control over the price that they receive for their products at the farm gate. Export trade is mostly undertaken by a handful of multinational companies and the extent of farm gate price realisation for the growers would depend on several factors including the complexity of the supply chain, transaction costs and the relative bargaining position of different actors in the supply chain.

In the case of tea, the value chain comprises several stages from green leaf production and primary processing through conversion into bulk and packaged products available for blending and sale to consumers. At the beginning of the value chain is the workers and small holders who pick and collect the tea leaves and at the end of the chain are the companies (usually multinational) that are involved in blending, packing and marketing. Tea is usually exported at a relatively early stage in the supply chain. Plucking and primary processing is usually carried out in producing countries while the more value added (and profitable) downstream activities such as blending, packing and marketing are mostly carried out by the companies in the buyer countries.

In order to ensure an efficient price transmission from retail markets to the farm gate, it is important that the small growers are well integrated into national and global value chains and that the transaction costs and inefficiencies at different stages of the value chain be kept to the minimum. The government may undertake appropriate policy measures and institutional reforms to strengthen the relationship between small growers, processing factories and exporting companies. In addition, the government may provide direct technical and marketing assistance to

small and marginalised farmers. These measures are very important since small holders are increasingly becoming important for tea production while the plantation companies are moving out of primary production and concentrating in the downstream stages of the value chain.

(iv) Compared to Sri Lanka, India is a minor player in the more value added downstream activities of blending, packaging, branding, distribution and marketing of tea. Sri Lanka is the world leader in the more value added 'black tea in immediate packing', with 25% of the world market share, while India has been losing its market share in this category. Our analysis confirms significantly high market power for Sri Lanka than India in this category. It is important to address the factors that hinder the growth of value added downstream activities in India.

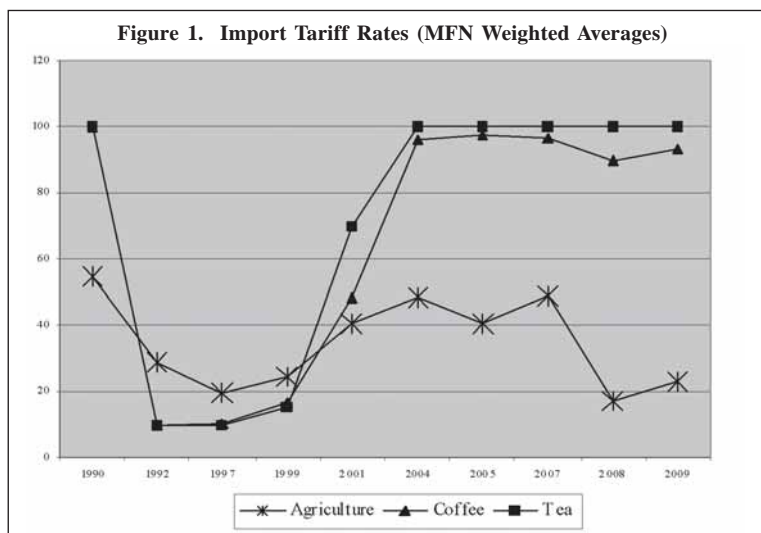
The government should create a policy environment that is conducive for entrepreneurs to invest in value added downstream activities. Among other things, it is imperative to ensure that the domestic industry achieves a deep integration with the vertically integrated global supply chains. To this end, India should eliminate its exorbitantly high tariff rates in tea and coffee and open up its multi brand retail sector for foreign direct investments¹⁶. A level playing field should be created for different types of business entities – domestic, foreign and joint ventures. The domestic market for tea and coffee should be as contestable as is the export market for competing suppliers from around the world. By improving their relative bargaining position, small growers and workers are likely to benefit more from a vibrant, efficient and globally integrated domestic industry than from their counterparts that enjoy both a monopsony power in buying and a monopoly power in selling in the domestic market.

16 India's import tariff rates in tea and coffee are one of the highest in the world (i.e., 100% for tea and 93% for coffee in 2009). The tariff rates for tea in both Sri Lanka and Kenya are much smaller – that is 30% in Sri Lanka and 25% in Kenya.

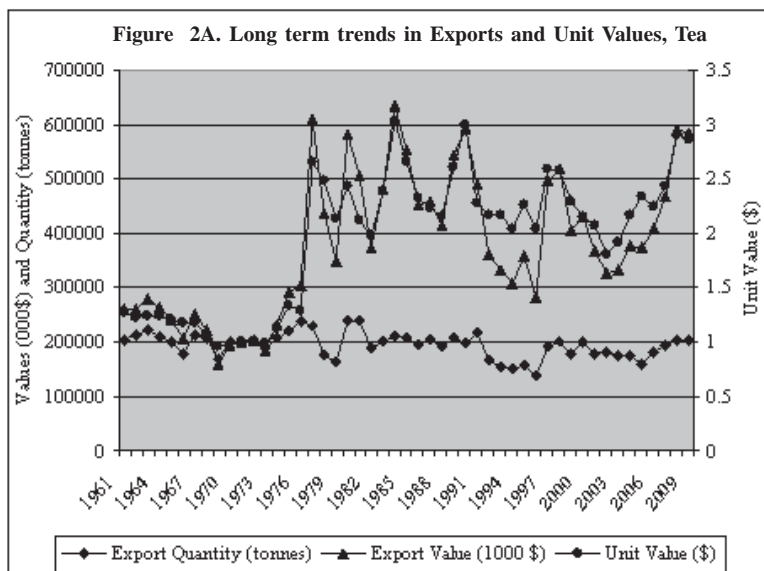
Acknowledgements

This paper is an outcome of an award of work to prepare a status paper under the National Research Programme on Plantation Development (NRPPD). I am thankful to the NRPPD for this award and to Professor K. J. Joseph (Member Convener, NRPPD) for helpful comments on this paper. An earlier version of the paper was presented at the Seminar on *Building Competitiveness in a Globalised World: Experience of India's Plantation Sector*, held at Centre for Development Studies, Thiruvananthapuram, January, 2012. I thank Professor D. Narayana and other participants for helpful comments and Sanjith R. Nair (UPASI) for discussions.

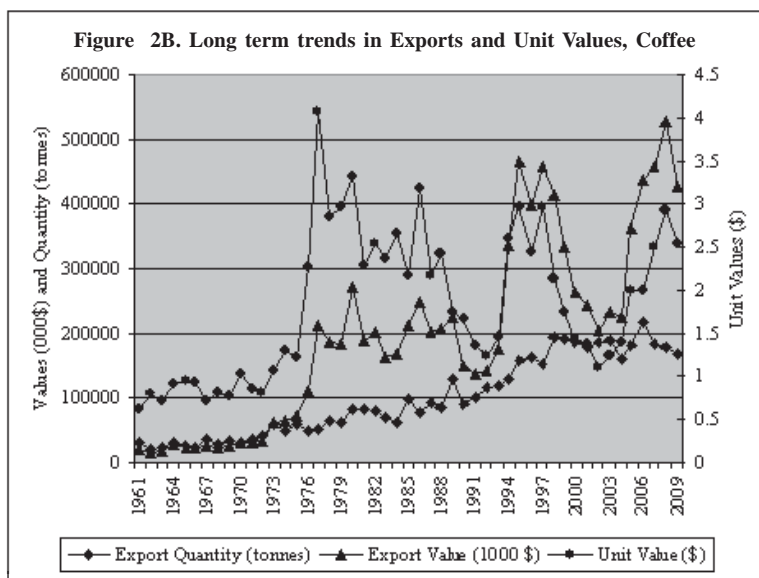
Dr. C. Veeramani is an Associate Professor at the Indira Gandhi Institute of Development Research (IGIDR), Mumbai. He carried out his Ph.D research at the Centre for Development Studies, Thiruvananthapuram.



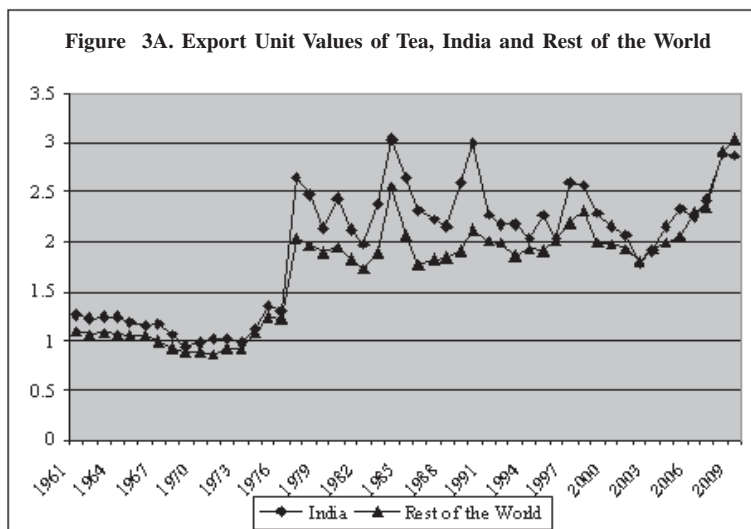
Source: TRAINS – WITS



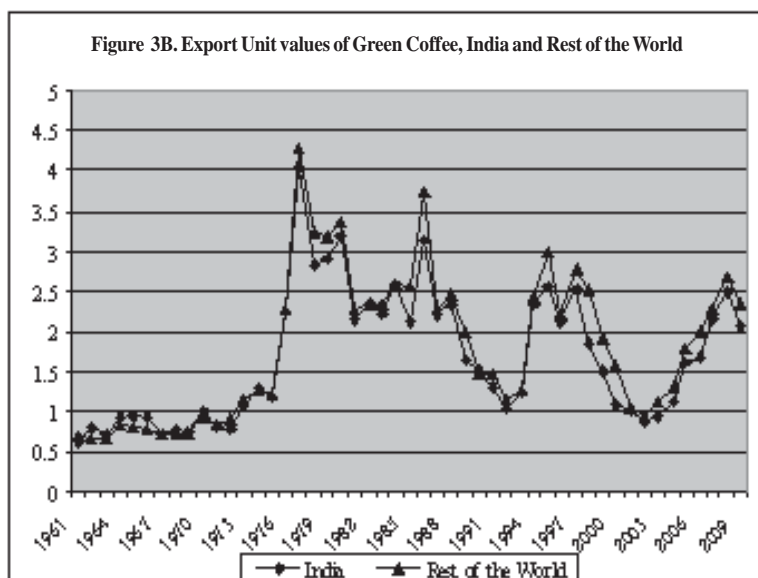
Source: Author's estimation using FAOSTAT data



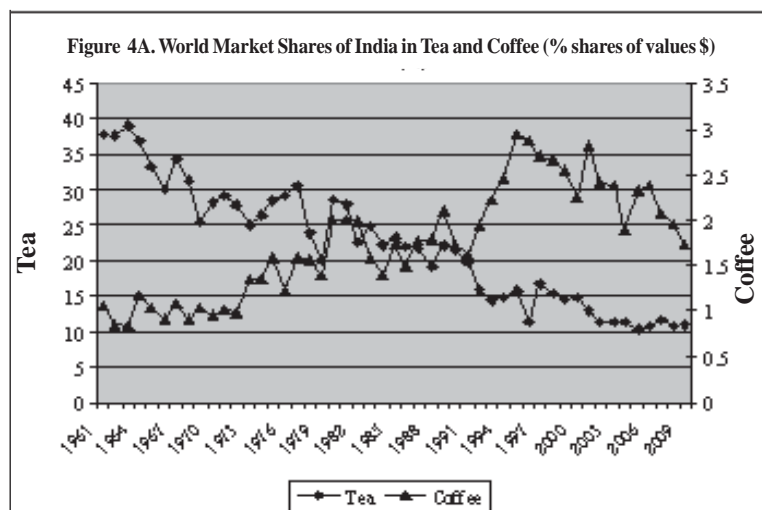
Source: Author's estimation using FAOSTAT data



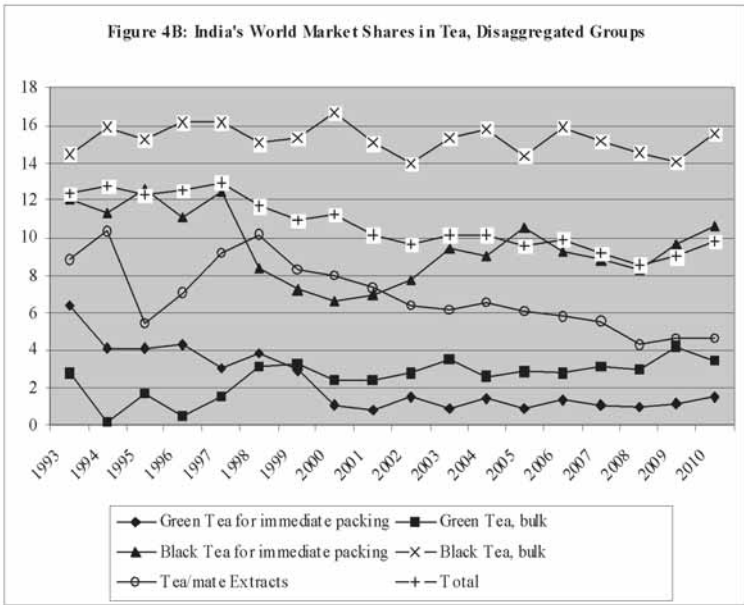
Source: Author's estimation using FAOSTAT data



Source: Author's estimation using FAOSTAT data

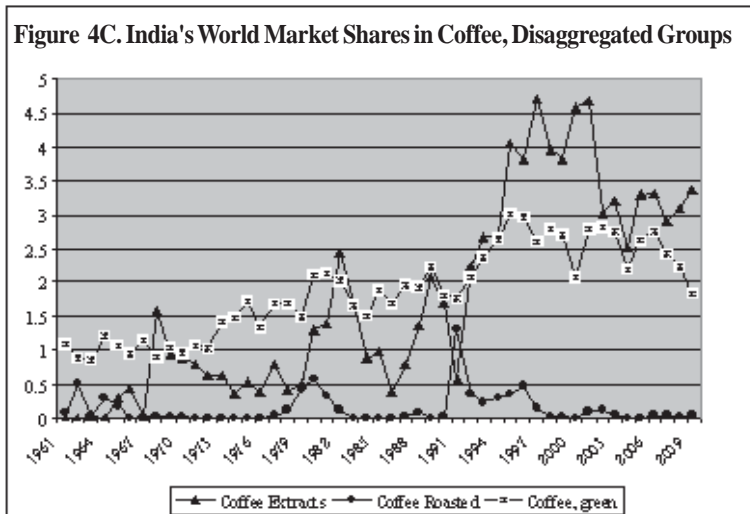


Source: Author's estimation using FAOSTAT data



Source: Author's estimation using COMTRADE-WITS data

Note: estimated using mirror (import) data reported by 67 countries



Source: Author's estimation using FAOSTAT data TABLES

Table 1: Average Annual Growth Rates of Exports, Value (\$), Quantity and Price, 1991-2010

Commodity	HS code	Period	Value	Quantity	Unit Value
Coffee	090111(coffee, not roasted or decaffeinated)	1991-2010	2.9	1.8	1.1
		1991-2000	9.1	6.4	2.5
		2001-2010	11.7	-2.5	14.5
	210110 (extracts, essences, concentrates of coffee)	1991-2010	10.4	12.0	-1.5
		1991-2000	26.3	31.7	-4.1
		2001-2010	11.3	1.5	9.7
	Total Coffee	1991-2010	4.1	2.2	1.9
		1991-2000	11.0	6.9	3.8
		2001-2010	11.5	-2.0	13.8
Green Tea	090210 (green tea in immediate packings)	1991-2010	1.3	-1.4	2.8
		1991-2000	-11.0	-12.9	2.2
		2001-2010	33.2	24.0	7.4
	090220 (green tea, n.e.s.)	1991-2010	9.9	5.9	3.8
		1991-2000	12.1	6.1	5.6
		2001-2010	46.4	39.6	4.8
Black Tea	090230 (black tea fermented and partly fermented in immediate packing)	1991-2010	-2.9	-5.6	2.9
		1991-2000	4.0	4.7	-0.7
		2001-2010	-3.1	-12.6	10.9
	090240 (bulk black tea fermented and partly fermented)	1991-2010	4.0	3.1	0.9
		1991-2000	-1.3	-2.7	1.4
		2001-2010	10.5	4.7	5.5
Tea / Mate Extracts	210120 (extracts, essences, concentrates of tea and mate)	1991-2010	9.7	9.0	0.6
		1991-2000	6.6	11.0	-4.0
		2001-2010	8.2	5.0	3.0
Total Tea	1991-2010	2.2	1.0	1.2	
	1991-2000	1.0	0.4	0.5	
	2001-2010	7.3	1.5	5.7	

Note: (i) Growth rates are calculated using semi-logarithmic regressions.

Source: Author's estimation using COMTRADE-WITS data.

Table 2: Export Unit Values, India and Rest of the World (\$), Tea

Years	Green tea in immediate packing (HS 090210)		Bulk green tea (HS 090220)		Black tea in immediate packing (HS 090230)		Bulk black tea (HS 090240)		Extracts and essence of tea/mate (HS 210120)	
	India	Rest of the World	India	Rest of the World	India	Rest of the World	India	Rest of the World	India	Rest of the World
1993	3.9	4.0	2.3	2.2	3.6	6.1	2.6	1.8	5.8	1.5
1994	3.2	3.3	2.9	2.0	3.6	6.3	2.3	1.8	6.1	2.3
1995	3.9	3.1	2.6	2.0	3.0	5.6	2.7	1.9	5.9	2.0
1996	4.0	2.8	3.3	2.4	4.2	6.6	2.7	1.9	6.3	2.7
1997	3.9	2.7	4.2	2.1	3.7	6.3	2.8	1.9	6.7	2.7
1998	3.6	2.8	4.1	2.1	5.1	6.5	3.0	2.0	6.6	2.6
1999	3.3	2.8	3.9	2.2	5.7	6.3	2.9	1.8	6.0	2.3
2000	5.8	2.6	4.0	2.2	5.4	5.6	2.6	1.8	6.4	1.8
2001	3.7	2.5	3.6	2.1	5.0	5.0	2.3	1.7	6.5	1.8
2002	3.9	2.3	3.8	2.0	4.5	4.9	2.2	1.6	5.2	1.8
2003	8.2	2.4	4.2	2.0	4.7	5.3	2.4	1.6	6.1	1.6
2004	6.3	2.8	3.2	2.2	5.0	6.0	2.3	1.7	7.0	1.7
2005	5.6	3.0	3.2	2.4	5.1	6.0	2.7	1.7	6.5	1.6
2006	8.4	3.3	3.6	2.6	6.0	7.0	2.3	1.9	6.1	1.7
2007	9.1	3.6	3.6	2.7	6.4	7.1	2.9	1.8	7.2	1.9
2008	10.4	4.1	4.0	2.8	4.7	3.6	3.2	2.2	8.1	2.6
2009	11.9	4.0	4.6	2.9	6.7	6.1	3.3	2.2	6.6	2.9
2010	12.9	4.2	4.1	2.8	7.2	8.9	3.2	2.4	8.4	4.3
Average Growth Rate	8.2	1.3	2.0	1.9	3.7	0.1	0.8	0.8	1.3	1.2

Note: (i) Unit values are estimated using the mirror data from a consistent set of 67 countries; (ii) Growth rates are calculated using semi-logarithmic regressions.

Source: Author's estimation using COMTRADE-WITS data.

Table 3A: World Market Shares of the Leading Exporters of Tea

	HS 090210		HS 090220		HS 090230		HS 090240		HS 210120					
	1996	2010	1996	2010	1996	2010	1996	2010	1996	2010				
China	56.8	45.5	China	75.7	60.1	Sri Lanka	25.4	24.7	Kenya	22.8	25.9	USA	21.2	20.1
U.K	3.3	8.4	Germany	2.4	9.4	U.K	19.5	18.9	Sri Lanka	12.4	18.1	Ireland	4.7	20.1
Japan	4.8	8.4	Japan	2.1	6.5	India	18.9	9.4	India	16.0	17.2	Canada	11.6	9.6
Sri Lanka	1.0	5.6	Indonesia	2.0	3.2	China	7.3	5.8	China	15.3	7.2	China	5.4	7.9
Germany	2.0	5.2	Vietnam	3.5	3.0	Poland	0.3	5.1	Indonesia	8.2	6.7	Germany	10.8	7.5
U.S.A	2.2	3.1	India	1.6	2.8	Germany	3.4	4.9	Argentina	3.3	4.9	Kenya	7.4	4.4
Poland	0.3	2.9	U.K	0.5	2.4	Belgium	0.0	4.6	Vietnam	0.6	3.2	India	6.8	4.1
Belgium	0.0	2.5	Sri Lanka	1.1	1.5	Russia	0.1	4.4	Malawi	2.2	3.1	Netherlands	3.4	4.0
Canada	0.1	2.5	Netherlands	0.1	1.4	U.A.E	0.0	3.2	Germany	3.6	2.6	Chile	4.8	2.8
France	1.1	1.6	Kenya	0.2	1.1	Canada	0.2	2.8	U.K	2.3	2.5	Japan	1.0	1.9
India	4.0	1.5	U.S.A	1.8	0.8	U.S.A	1.7	2.1	Tanzania	0.5	1.1	Sri Lanka	3.3	1.7
Russia	0.0	1.4	Australia	0.0	0.7	France	2.9	1.2	Nepal	0.0	0.8	Switzerland	1.1	1.6
Morocco	0.0	1.4	Brazil	1.7	0.7	Netherlands	2.9	1.0	Netherlands	1.1	0.7	UK	3.7	1.3
Austria	0.2	1.1	Thailand	0.0	0.5	Kenya	0.6	1.0	Zimbabwe	0.6	0.6	Italy	1.4	1.2
Hong Kong	2.1	0.8	Argentina	0.0	0.5	Azerbaijan	0.0	1.0	South Africa	1.4	0.6	Poland	2.5	1.0
U.A.E	4.4	0.7				Indonesia	2.1	0.9	U.A.E	0.3	0.5	Spain	0.6	0.9
Spain	0.1	0.6				Sweden	0.5	0.7	Iran	0.0	0.5	Malaysia	0.6	0.8
Netherlands	0.6	0.6				Hungary	0.3	0.7				Mexico	0.1	0.7
Hungary	0.0	0.6				Ireland	0.3	0.7				France	2.3	0.6
Czech Rep	0.0	0.5				Austria	0.2	0.6				Austria	0.9	0.5
												Indonesia	0.2	0.5

Description of the HS codes: 090210 (green tea in immediate packings); 090220 (green tea n.e.c.); 090230 (black tea in immediate packings); 090240 (bulk black tea); 210120 (tea / mate extracts, essences).

Source: Author's estimation using COMTRADE-WITS data.

Table 3B: World Market Shares of Leading Exporters of Coffee

HS 090111			HS 210110		
	1996	2010		1996	2010
Brazil	15.2	29.9	Switzerland	3.3	19.8
Colombia	16.8	11.6	Germany	21.8	14.3
Vietnam	3.9	11.4	Netherlands	11.4	9.1
Peru	2.5	5.5	France	4.6	6.9
Indonesia	6.3	5.3	Brazil	8.8	6.7
Guatemala	5.8	4.9	UK	9.4	6.6
Honduras	2.9	4.1	Spain	2.0	6.1
Ethiopia	2.4	3.3	USA	3.0	5.1
Nicaragua	1.3	2.3	Belgium	0.0	3.8
Germany	0.7	2.2	Colombia	8.4	3.6
India	3.4	2.1	Ecuador	2.4	2.4
Mexico	5.8	2.0	Italy	1.5	2.2
Costa Rica	3.9	1.8	Hungary	0.7	1.4
Uganda	4.2	1.6	Poland	0.4	1.3
El Salvador	3.8	1.4	Malaysia	0.1	1.2
Kenya	3.0	1.4	Czech Rep	0.0	1.1
Papua New Guinea	1.7	1.3	Cote d'Ivoire	8.7	1.0
Belgium	0.0	1.1	India	0.7	0.8
Cote d'Ivoire	2.5	1.0	Greece	0.1	0.6
Tanzania	1.2	0.8	Korea, Rep.	0.5	0.6
China	0.0	0.6	Mexico	0.8	0.5
Cameroon	1.4	0.5	Morocco	0.5	0.5

Description of HS codes: 090111 (coffee, not roasted or decaffeinated); 210110 (coffee extracts, essences).

Source: Author's estimation using COMTRADE-WITS data.

Table 4: Composition of India's Tea Exports (% shares)

HS codes	Description	1991	2001	2010
Tea				
090210	Green tea in immediate packings	1.2	0.3	3.6
090220	Bulk green tea	0.5	0.1	1.7
090230	Black tea in immediate packing	32.7	45.9	11.9
090240	Bulk black tea	64.3	50.2	79.3
210120	Tea/mate extracts, essences	1.3	3.4	3.5
	Total	100	100	100
Coffee				
090111	Coffee not roasted or decaffeinated	88.4	65.9	69.4
090112	Decaffeinated coffee, not roasted	0.0	0.7	0.0
090121	Roasted coffee, not decaffeinated	4.0	0.2	0.2
090122	Roasted, decaffeinated coffee	3.4	0.1	0.0
090130	Coffee husks and skins	0.2	0.0	0.0
210110	Coffee extracts, essences	4.1	33.2	30.3
	Total	100	100	100

Source: Author's estimation using COMTRADE-WITS data.

Table 6A: Country and Exchange Rate Effects for 'bulk black tea' (HS 090240)

countries	Exporting country: India			Exporting country: Kenya			Exporting country: Sri Lanka			
	λ_i	t	β_i	λ_i	t	β_i	λ_i	t	β_i	t
USA	-1.64 [†]	-2.97	-0.17 [†]	-2.85	-1.14	-0.49	-0.29	-0.68	-0.09	-1.67
UK	-0.26	-0.47	0.02	0.41	0.82	0.23	0.62	1.51	0.01	0.25
France	-0.52	-0.89	-0.11 [†]	-3.35	-2.4	-0.87 [®]	1.12 [†]	4.01	0.06	1.58
Germany	0.84 ^ψ	1.64	0.07 [®]	2.06	0.28	0.06	0.56 ^ψ	1.63	0.00	0.02
Netherlands	-0.92 ^ψ	-1.63	-0.11 [†]	-2.62	0.06	0.01	1.73 [†]	6.18	0.24 [†]	4.12
Canada	-0.97 ^ψ	-1.74	-0.06	-1.04	0.2	0.01	1.23 [†]	3.98	0.07 [†]	2.64
Japan	0.03	0.05	-0.04	-0.68	-0.42	-0.05	0.06	0.16	-0.06	-1.16
Finland	0.31	0.43	0.08	0.98	1.59	0.29	-0.01	-0.01	-0.10	-0.25
Ireland	-0.48	-0.85	-0.01	-0.09	0.62	0.13	0.60 ^ψ	1.6	-0.06 [†]	-2.01
Australia	-2.35 [†]	-3.39	-0.26 [†]	-3.07	0.99	0.17	0.42	1.08	0.03 [®]	2.25
Iran	-0.36	-0.59	-0.05	-1.26	0.34	0.09	2.42 [†]	2.8	0.39 [®]	2.36
Iraq	-0.50	-0.83	0.01	0.21	2.41	0.23 [®]	0.72 [†]	2.46	0.07	1.03
Qatar	0.49	0.52	0.07	0.53	0.35	0.04	0.49	1.46	0.01	0.11
Saudi Arabia	0.79	0.93	0.17	1.49	1.18	0.13	2.09 ^ψ	1.76	0.16	0.99
Afghanistan	1.87	1.17	0.57 ^ψ	1.75	1.62	0.17 ^ψ	-0.28	-0.32	-0.08	-0.75
Cambodia	-0.07	-0.09	1.25	1.1	0.48	0.07	3.36 [†]	6.13	0.28 [†]	4.36
Sri Lanka	-0.62	-0.99	-0.02	-0.18	-0.39	-0.06	3.50 [†]	5.8	0.38 [†]	4.38
Pakistan	0.71	1.27	0.38 [†]	4.13			-0.06	-0.21	-0.08 [®]	-1.93
Kenya	0.30	0.45	0.31 [†]	3.1			2.06 [†]	6.72	0.21 [†]	3.9
Tunisia	-1.98 [®]	-2.43	-0.15	-1.43			3.05 [†]	8.17	0.33 [†]	5.45
Kazakhstan	-0.93	-1.6	-0.15 [†]	-2.65						
Russia	0.07	0.12	0.14 [†]	2.67						
Poland	-0.28	-0.5	0.07	1.45						
Egypt			0.12	1.19						
Observations	597			224			315			
R ²	0.90			0.64			0.95			
Period	1988-2009			1997-2010			1990-2010			

Notes: (i) τ , φ and ψ stand for significance at 1%, 5% and 10%, respectively (ii) t-statistics are robust to heteroskedasticity.

Table 6B: Country and Exchange Rate Effects for 'black tea in immediate packing' (HS 090230)

Importing countries	Exporting country: India			Exporting country: Sri Lanka			Exporting country: UK				
	λ_i	β_i	t	λ_i	β_i	t	λ_i	β_i	t		
USA	-0.56	-0.52	-0.02	USA	0.35 ⁺	2.98	USA	2.44	1.14	0.54	1.18
UK	1.60	1.31	0.24 ⁺	UK	-0.94	-0.84	Belgium	4.01	0.92	1.15	1.16
Germany	-0.50	-0.38	-0.04	France	1.54 ⁺	4.59	France	0.16	0.14	0.04	0.53
Netherlands	-0.38	-0.33	-0.01	Germany	2.96 ⁺	4.93	Germany	1.28	1.02	0.32 ⁺	2.86
Canada	-0.08	-0.07	0.02	Netherlands	2.68 ⁺	4.62	Italy	0.29	0.25	-0.07 ⁺	-4.08
Japan	1.20	1.17	0.34 ⁺	Canada	3.57 ⁺	4.74	Norway	0.97	0.79	0.26	1.06
Ireland	3.37	1.53	0.44	Japan	3.56 ⁺	4.54	Sweden	-0.12	-0.09	-0.05	-0.13
Australia	0.42	0.36	0.07	Finland	3.03 ⁺	6.93	Switzerland	1.98	0.82	0.51	0.9
Iran	-0.43	-0.4	-0.12	Finland	1.28 ⁺	3.84	Canada	-2.51 ^v	-1.61	-0.68 ^{vv}	-2.38
Iraq	-1.01	-0.9	-0.04 ^o	Greece	0.48	0.81	Turkey	0.35	0.27	0.33	0.4
Israel	4.26	1.4	0.65	Australia	0.49	0.96	Finland	-0.52	-0.44	-0.31 ⁺	-5.03
Kuwait	0.34	0.31	0.06	New Zealand	0.41	0.67	Ireland	0.16	0.1	0.15	0.49
Qatar	-0.21	-0.18	-0.01	Iran	1.36 ⁺	3.74	Malta	-1.16	-0.52	-0.13	-0.35
Saudi Arabia	0.36	0.36	0.10	Iraq	1.07 ⁺	2.82	Spain	-0.07	-0.06	0.01	0.12
Afghanistan	9.26 ⁺	2.55	2.19 ⁺	Israel	1.02 ^v	1.71	Turkey	2.06	1.56	0.55 ⁺	3.09
Cambodia	-0.80	-0.73	-1.24 ⁺	Jordan	0.43	0.63	Australia	2.79 ^o	2.13	0.70 ⁺	3.62
Sri Lanka	-1.08	-0.59	-0.11	Kuwait	2.07 ⁺	5.43	Cyprus	6.95	1.37	1.51	1.41
Hong Kong	-0.57	-0.4	-0.07	Lebanon	3.57 ⁺	3.6	Saudi Arabia	1.22	0.28	0.31	0.21
Pakistan	-0.85	-0.55	0.02	Saudi Arabia	2.48 ⁺	5.93	India	-0.37	-0.31	0.78	0.62
Thailand	-0.04	-0.04	0.03	Syria	0.64 ^v	1.85	Russia	-0.33	-0.28	-1.03 ⁺	-5.8
Kazakhstan	-1.49	-1.25	-0.31 ^v	Hong Kong	3.14 ⁺	6.51	Egypt				
Russia	-1.40	-1.16	-0.20	India	0.54	0.49					
Poland	-1.87 ^v	-1.74	-0.22 ^o	Libya	-1.49 ^v	-1.68					
Egypt			0.10	Russia	0.62 ^v	2.00					
Observations	432			Lithuania	0.36	0.79					
R2	0.66			Poland	0.66	1.11					
Period	1988-2009			Egypt	0.96						
				1990-2010	393						
				1993-2010	0.59						

Notes: (i) τ , φ and ψ stand for significance at 1%, 5% and 10%, respectively, (ii) t-statistics are robust to heteroskedasticity.

Table 6C: Country and exchange rate effects for Coffee, not roasted or decaffeinated (HS 090111)

Importing countries	Exporting country: India			Exporting country: Brazil			Exporting country: Columbia					
	λ_i	t	β_i	λ_i	t	β_i	λ_i	t	β_i	t		
USA	-0.60	-1.2	-0.09 ^v	-1.77	-0.22	-1.26	-0.05	-1.1	-1.04	-0.05 ^o	-2.29	
UK	1.00	1.45	0.09	1.13	0.07	0.26	-0.01	-0.2	-0.70	-0.74	-1.11	
Belgium	-1.22 ^v	-1.75	-0.16 ^o	-2.23	0.07	0.39	-0.01	-0.41	-8.58 ^t	-2.63	-0.65 ^t	-2.64
France	0.54	1.47	0.05 ^o	2.32	-0.06	-0.46	-0.05	-1.11	-0.37	-0.41	0.1	0.3
Germany	-0.14	-0.21	-0.04	-0.65	-0.01	-0.07	-0.03	-1.37	-0.71	-0.79	-0.03 ^o	-1.93
Italy	0.22	0.6	0.01 ^o	1.94	0.01	0.04	-0.02	-0.73	-0.41	-0.45	-0.01 ^v	-1.79
Netherlands	1.08 ^t	2.48	0.10 ^t	2.59	0.14	0.76	-0.01	-0.95	-0.51	-0.56	-0.01	-0.82
Norway	0.95 ^o	2.08	0.11 ^v	1.87	-0.22	-1.45	-0.07 ^o	-2.08	-0.41	-0.45	-0.01	-0.2
Switzerland	1.54 ^t	3.38	0.15 ^t	3.08	-0.08	-0.64	-0.07	-1.52	-0.60	-0.65	-0.01	-0.89
Canada	0.83	1.52	0.10	1.57	-0.04	-0.32	-0.05	-1.0	-0.84	-0.91	-0.04 ^v	-1.87
Japan	0.50	1.23	0.06	0.81	-0.36	-1.44	-0.09	-1.6	-0.97	-1.07	-0.09 ^t	-3.43
Greece	0.02	0.06	0.01	0.54	0.16	0.88	-0.10 ^v	-1.73	-0.46	-0.51	-0.01	-0.91
Portugal	0.14	0.37	0.01	1.15	0.14	0.86	-0.01	-0.2	-0.45	-0.49	-0.01 ^v	-1.86
Spain	0.06	0.17	0.01	0.18	0.01	0	0.01	0.83	-1.14	-1.24	-0.07 ^t	-3.10
Australia	0.78 ^v	1.65	0.07	1.38	0.04	0.25	-0.01	-1.24	-1.72 ^v	-1.75	-0.13 ^t	-2.89
Israel	2.04 ^t	3.02	0.27 ^t	2.84	0.20	1.17	0.05	1.07	-0.53	-0.59	-0.04	-1.48
Jordan	-1.33 ^t	-2.58	-0.18 ^t	-3.31	-0.04	-0.26	-0.05	-1.03			0.03	0.33
Kuwait	1.07 ^v	1.75	0.06	1.05	-0.17	-0.51	-0.04	-0.47				
Saudi Arabia	0.56	0.9	0.02	0.22	-0.04	-0.26	-0.05	-1.03				
Syria	0.11	0.23	-0.03	-0.42	-0.17	-0.17	0.06	0.12				
Algeria	0.78	0.46	0.20	0.49	-0.03	-0.17	0.01	0.16				
Libya	-2.86 ^t	-2.51	-0.36 ^t	-2.75	-1.48	-0.48	-0.88	-0.48				
Russia	1.04 ^o	1.97	0.14 ^v	1.62	0.27	0.97	-0.07	-1.35				
Croatia	0.32	0.6	0.05	0.79	0.29	1.21	0.05	0.72				
Slovenia	-0.05	-0.14	-0.01	-0.49	-0.08	-0.36	-0.01	-1.26				
Egypt			-0.01	-0.12			0.01	0.15				
Observations	516				389							
R2	0.95				0.98							
Period	1988-2009				1994-2010							
					1991-2010							

Notes: (i) τ , ϕ and ψ stand for significance at 1%, 5% and 10%, respectively (ii) t -statistics are robust to heteroskedasticity.

References

- Ali, Ridwan Yusuf A Choudhry and Douglas W Lister (1997): 'Sri Lanka's Tea Industry: Succeeding in the Global Market', *World Bank Discussion Paper No. 368*, The World Bank, Washington DC.
- Drysdale, Peter and Ross Garnaut (1982): 'Trade Intensities and the Analysis of Bilateral Trade Flows in a Many Country World: A Survey', *Hitotsubashi Journal of Economics*, 2 (2): 62-84.
- George Tharian, K and Joby Joseph (2005): 'Value Addition or Value Acquisition? Travails of the Plantation Sector in the Era of Globalisation', *Economic and Political Weekly*, Vol. 40 (26), 2681-2687.
- Goldar, B N (2005): 'Impact on India of Tariff and Quantitative Restrictions under WTO', *Working Paper 172*, Indian Council for Research on International Economic Relations, New Delhi.
- Goldberg P K and Knetter, M (1997): 'Goods Prices and Exchange Rates: What have we Learned?', *Journal of Economic Literature*, Vol. 35(3), pp. 1243-1272.
- Kathuria, S (1996): 'Export Incentives: The Impact of Recent Policy Changes in India' *Indian Economic Review*, Vol. 31 (1): 109-126.
- Knetter, M (1989): 'Price Discrimination by US and German Exporters', *American Economic Review*, 79(1), 198-210.
- Krugman, Paul (1987): 'Pricing to Market when the Exchange Rate Changes', in Sven W Arndt and J David Richardson (eds) *Real Financial Linkages among Open Economies*, Cambridge, MIT Press, pp 49-70.
- Mehta, R (2000): 'Removal of QRs and Its Impact on India's Imports', *Economic and Political Weekly*, Vol. XLIV (38): 11-15.
- Orden, David, Fuzhi Cheng, Hoa Nguyen, Ulrike Grote, Marcelle Thomas, Kathleen Mullen, and Dongsheng Sun (2007):

'Agricultural Producer Support Estimates for Developing Countries: Measurement Issues and Evidence from India, Indonesia, China, and Vietnam', *Research Report 152*, International Food Policy Research Institute, Washington D C.

Otero, Jesus and Milas, Costas (2001): 'Modeling the Spot Prices of Various Coffee Types', *Economic Modelling*, Vol. 18 (4): 625-641.

Pick, D H and Park, T A (1991): 'The Competitive Structure of U.S Agricultural Exports', *American Journal of Agricultural Economics*, 73(1), pp. 133-141.

Srinivasan, T N (2000): *Eight Lectures on India's Economic Reforms*, Oxford University Press, New Delhi.

Srinivasan, T N (2008): 'Development Strategy, the State and Agriculture since Independence', Valedictory Address, Conference on Money and Finance, January 18-19, 2008, Indira Gandhi Institute of Development Research, Mumbai.