

## REVEALED COMPARATIVE ADVANTAGE ANALYSIS OF PAKISTAN'S AGRICULTURAL EXPORTS

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This paper attempts to look at actual export performance by employing revealed comparative advantage approach pioneered by Balassa in contrast to several previous studies of Pakistan's ex-ante comparative advantage in export of agricultural products. Detailed trade information from SITC data was used to study relative export performance for a broad range of agricultural products. The results indicate that Pakistan has strong revealed comparative advantage in cereals exports, and that the country capitalized on this during international commodity price boom, especially for rice exports. However, actual performance was weak for high value products such as livestock and dairy, and was erratic for vegetables. Only mango and citrus show a high revealed comparative advantage, although the country grows a large variety of fruits.

### I. Introduction

Agriculture is the second largest sector of Pakistan's economy contributing 21 per cent to GDP and employs 45 per cent of the labor force. Moreover, 62 per cent of the country's population lives in rural areas and is indirectly dependent on agriculture for livelihood. Agricultural products play an important role in generating export earnings. Food exports account for 17 per cent of all exports of the country. More importantly, 53 per cent of Pakistan's total exports comprise textile products which use cotton as raw material, The share of raw cotton exports is small at 1.2 per cent.

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Poverty is much more pronounced in rural areas of Pakistan. The rural poverty head count ratio has been higher compared to the urban areas. Sustained agricultural growth driven by exports of agricultural products, especially high-value fruit and livestock products, can reduce poverty among farm households. It can also lower poverty rates among the rural non-farm poor through growth linkages with rural non-farm sector. Agricultural trade liberalization under WTO attempts to create a level playing field among exporters and offers Pakistan possibilities for increasing its agricultural exports. However, there are also risks associated with the new regime that could see Pakistan lose market share to competitors who are more efficient and in better compliance with SPS protocols. In this changed context, actual export performance rather than ex-ante comparative advantage has become an important issue.<sup>1</sup>

A few studies in Pakistan have investigated actual export performance but most of this work has focused on industrial or non-agricultural products, e.g., Yousuf (2008), and Mahmood (1994). Research on Pakistan's comparative advantage in agricultural was almost entirely undertaken using the Domestic Resource Costs (DRC) methodology that measure potential rather actual comparative advantage. For example, see AERC (1991), Ahmed (1993), Appleyard (1987), Longmire and Debord (1993), Maan and Khawaja (1993) and Mahmood (1991). There are very few papers that have investigated Revealed Comparative Advantage (RCA) for Pakistan's agricultural exports, and even these are limited to a few broad agricultural product categories. [Samaratunga, et al. (2007) and CARIS (2008)]. The present study attempts to fill this gap by focusing on RCA by presenting RCA indices for two dozen product categories, at various levels of aggregation.

### *Revealed Comparative Advantage*

Trade theories assume comparative advantage arises from differences in factor endowments (Heckscher-Ohlin model) or technologies (Ricardian Model). Both models rely on relative price differential among countries to explain trade flows. However, pre-trade relative prices are not observable, making it difficult to test models based on comparative advantage.

The first empirical study to attempt to address this difficulty was Liesner (1958), who measured comparative advantage as a ratio of a country's exports of a specific product to total exports of that product in a reference market (possibly consisting of several countries, e.g., the EU). In other words, actual trade flows rather than the underlying relative prices were used to empirically implement the concept.

Later, Balassa (1965) argued that measurement of comparative advantage may not involve all constituents affecting it, rather observed trade flows 'reveal' country's

comparative advantage. The Revealed Comparative Advantage index, also known as Balassa's Index, looks at a country's comparative advantage, based on its 'actual' export performance. This is in contrast with several other measures such as the domestic resource costs coefficients (DRCs) that aim to capture 'potential' comparative advantage.

Balassa's Index has been widely adopted by researchers. For product  $j$  exported from country  $i$  Balassa revealed comparative advantage index ( $RCA_{ji}$ ), is given by:

$$RCA_{ji} = (X_{ji}/X_{jw}) / (X_i/X_w) \quad (1)$$

where

- $X_{ji}$  = exports of product  $j$  from country  $i$ ,
- $X_{jw}$  = world exports of the product  $j$ ,
- $X_i$  = exports of country  $i$ , and,
- $X_w$  = world exports.

The value of RCA index greater or equal to one means the existence of revealed comparative advantage. On the other hand, a value below one implies comparative disadvantage. A limitation of the RCA index is that it provides a good measure of a country's comparative advantage when trade is relatively free. However, tariffs, quotas and other trade barriers may distort country's actual export performance.<sup>2</sup>

A common usage of the index has been to as 'demarcation between countries that reveal a comparative advantage and those that do not' [Benedictis and Tambari (2004)]. But it also allows quantifying degrees of comparative advantage in a specific product enjoyed by two countries, and constructing cross-sector rankings for a given country (Balance et al. (1987)]. The latter aspect is the main focus of this paper, which aims at examining Pakistan's exports performance in world markets for selected agricultural products.

The conceptual index defined by equation (1) above is quite flexible in terms of both product definition, as well as geographic coverage of the markets considered. Various definitions of the 'product' can be used to compute the value of the index. For the purposes of this study, the Standard International Trade Classification (SITC), Revision 3, is used because it allows the product to be defined at various levels of aggregation. The index is computed at alternative levels of aggregation as discussed below. The flexibility with respect to geographic coverage means that relative export performance may be studied at global or at regional levels. The RCA

<sup>2</sup>The author is grateful to an anonymous referee for comments.

formula (1), which is used to compute indices reported in this study, assumes that performance is measured in the world market.<sup>3</sup>

The focus of this study is on agricultural trade. It aims to identify products where Pakistan has demonstrated – read revealed – comparative advantage, and to understand factors that at present limit the possibilities for further enhancement of the relative export performance. Agricultural export data based on SITC classification was obtained for the ten year period from 1999-2008 from IMF's trade database.

## II. Pakistan's Agricultural Exports

The paper start with a working definition of the country's agricultural exports. For the purposes of this study, Pakistan's agricultural exports are taken to be products listed under SITC 'Food and live animals' category. Not all of the sub-categories of products listed under this code are equally important from the perspective of analyzing Pakistan's relative export performance in agricultural trade. The following categories are selected at SITC 2-digit level:

- Meat and meat preparations.
- Dairy products and birds' eggs.
- Cereals and cereal preparations.
- Vegetables and fruit.

In this research, some agricultural products have been excluded due to their small share in the agriculture exports market, although they are important in the domestic market. These include cotton, which is key cash crop in Pakistan, as well as fish, hides and skins, and cut flowers.<sup>4</sup>

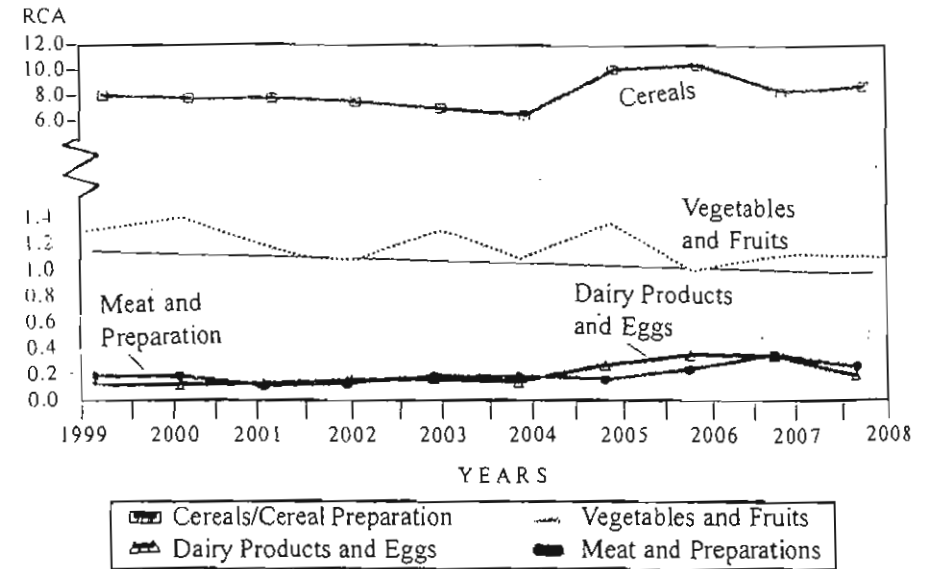
## III. Patterns of Revealed Comparative advantage

- a) *Livestock sector contributes more than half of agricultural value-added but the country does not possess revealed comparative advantage in livestock products.*

In Pakistan significant land and water resources are committed for maintaining the large bovine population. The value added in the livestock sector is 52 per cent of value-added in the agriculture sector [Government of Pakistan (2009)]. But exports

<sup>3</sup> However, this assumption will be relaxed in our future research to allow measurement of Pakistan's relative export performance in the selected regional/country markets.

<sup>4</sup> These products would be considered in a more detailed study in future. The case of cotton is particu-



Source: SITC data and author's calculations.

FIGURE 1

Pakistan's Revealed Comparative Advantage (Balassa) in main Agricultural Products

of livestock products did not enjoy revealed comparative advantage during 1999-2008. The RCA index for 'meat and preparations,' and for 'dairy products and eggs', did not exceed 0.4, which is significantly lower than the threshold level of one (see Figure 1).

A more disaggregated analysis of this group was conducted for selected products at three digit level. The products were: 'beef, fresh/chld/froz' (011), and 'meat nes, fresh/chld/froz' (012). The RCA index for meat (012) remained very low throughout the decade with highest value not exceeding 0.4 (see Table 1). The relative

larly interesting. As figure A1 (in Appendix-1) shows, cotton exports declined very drastically over time as Pakistani textile sector absorbed progressively large share of domestic production of the commodity. However, moving up the value addition chain is only part of the more complex cotton situation in Pakistan. The other and perhaps more revealing aspect is that export performance deteriorated because cotton output stagnated, and even declined in some years, leading to progressively smaller and eventually vanishing exportable surpluses. The main reasons behind output stagnation were the leaf curl virus and other pest attacks, and country's slow and unregulated adoption of BT cotton. Therefore, a more detailed study of Pakistan's export performance should include cotton.

TABLE 1

Revealed Comparative Index (Balassa):  
Meat products

Year	Beef, fresh/ chilled/frozen (SITC code 011)	Meat nes, fresh/ chilled/frozen (SITC code 012)
2000	0.0	0.2
2001	0.0	0.1
2002	0.1	0.1
2003	0.1	0.2
2004	0.1	0.3
2005	0.1	0.2
2006	0.2	0.3
2007	0.6	0.4
2008	0.6	0.2
2005	0.1	0.2
2006	0.2	0.3
2007	0.6	0.4
2008	0.6	0.2

Source: SITC data and author's calculations.

export performance of the beef products (011) was also quite similar for most of the period under review. A modest improvement was observed in the last two years, there was a significant up-tick when the RCA index values rose to 0.6.

For the category 'eggs, albumin' (025), the findings are presented in Appendix-II. The revealed comparative advantage index had low values except during the early part of the decade when the index reached a level of 0.8 (in 2002). But later, this momentum was lost as RCA index dropped to almost zero by 2008. The picture is somewhat more optimistic with respect to the other sub-category, 'milk and cream and milk products other than butter or cheese' (022), where the latter half of the decade saw RCA index reaching 0.7

*b) Pakistan capitalized on its traditionally strong revealed comparative advantage in rice during the recent commodity price boom.*

Pakistan enjoys significant revealed comparative advantage in cereals (see Figure 1) but it is necessary to look separately at comparative advantage patterns

TABLE 2

Revealed Comparative Advantage Index  
(Balassa): Rice

Year	Rice (SITC code 042)
1999	48.9
2000	56.3
2001	49.3
2002	44.8
2003	54.0
2004	50.8
2005	70.6
2006	75.5
2007	65.1
2008	146.0

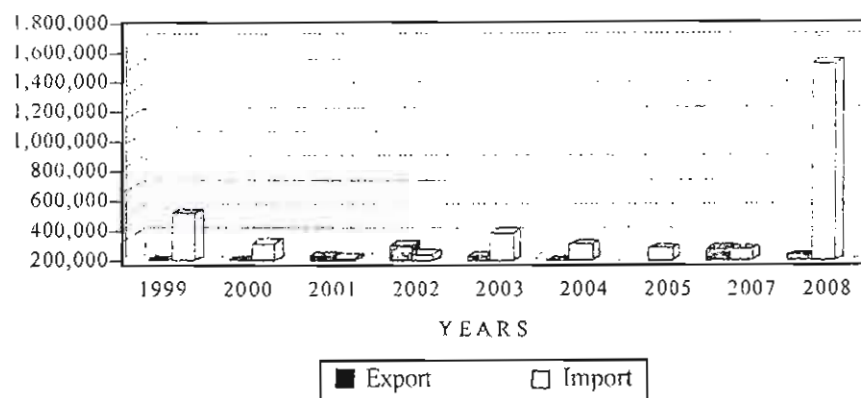
Source: SITC data and author's calculations.

of the two main staple foods, wheat and rice, and to separate asymmetric effects of domestic demand on their respective export performance.

Relative export performance of Pakistani rice (042) was very good with the RCA index varying between 45 and 146 during the decade (see Table 2). The latter value was for the year 2008. In general, the very high values occurred towards the end of the decade – a period marked by international commodity price boom. The significant feature of this period was the restrictions on rice exports by many exporting countries to protect domestic consumers. Since the main staple food in Pakistan is wheat, increases in domestic rice prices did not quite have the same implications for the Government of Pakistan as it did for other governments in mainly rice consuming countries. Consequently, Pakistan was able to increase its share in the thin international rice market as fewer supplies were available from competitors.

*c) The relative export performance of wheat products is erratic, and is strongly influenced by domestic agricultural policies.*

The relative export performance of wheat and wheat products is more complex. Pakistan imported wheat in more years than it exported (see Figure 2). The



Source: SITC data and author's calculations. Data for 2006 was not available.

FIGURE 2

Pakistan's Wheat Trade (\$000)

big spike in the value of wheat imports in the year 2008 was at least partly due to tripling of international wheat prices.

Despite this erratic export performance, for many years, the RCA index was significantly above one, with the highest value of 5.6 recorded for the year 2002 (see Table 2). Thus, Pakistan's revealed comparative advantage in wheat is significant but very unstable. The reason is that although the country is a fairly large producer of the commodity<sup>5</sup> it also has a large population (170 million). Even a relatively small discrepancy in supply and demand can not only significantly change the value of revealed comparative advantage index but reverse trade flows altogether.

The other important issue is the largely undocumented wheat shipments to Afghanistan. Wheat is routinely smuggled to Afghanistan from Pakistan in addition to official exports. Last year, because the gap between Pakistani domestic and international prices of wheat was very large, sizable flows of wheat to neighboring countries took place. In view of this, RCA estimates that rely on official figures only underestimate the relative export performance of Pakistan's wheat sector. Sustained increase in wheat yields would be required to consolidate the revealed comparative advantage in this commodity.

In addition to grain, wheat flour is also exported. In the sub-category Flour/

<sup>5</sup> Provisional estimates reported in Pakistan Economic Survey, wheat production in Pakistan was 21 million tons in 2007-08. For comparison, 2008 wheat production in Australia was 21.3 million tonnes according to FAOSTAT (<http://faostat.fao.org>).

TABLE 3

Revealed Comparative Advantage Index:  
Wheat & wheat products

Year	Wheat /Meslin (SITC code 041)	Flour/M Meal wheat/meslin (SITC code 046)
2000	0.0	0.2
2000	0.2	2.1
2001	1.8	15.3
2002	5.6	19.4
2003	1.6	15.2
2004	0	14.9
2005	-	25.6
2006	-	34.3
2007	2.4	20.5
2008	0.5	0.3

Source: SITC data and author's calculations.

meal wheat/meslin (SITC code 046) Pakistan enjoys a huge revealed comparative advantage. Except for 2008, wheat flour exports consistently had value of RCA index 1. In fact, in nearly all years the value of RCA index for this sub-category was 15 or higher; the highest value was 34.3 in 2003.

When considered together with export performance of wheat grains, this is an interesting result. For wheat flour to have greater revealed comparative advantage than wheat grains, either the wheat milling sector has to be very efficient, or there has to be market distortions that influence trade flows. Pakistan's wheat milling sector is over capitalized. So it cannot be considered very efficient. Mills do receive wheat at officially controlled release prices that may involve element of subsidy. The relative export performance of wheat flour appears linked to policy-induced distortions in the domestic market than a consequence of the existence of genuine comparative advantage.

*d) Export potential of vegetables is not fully realized because of high variability in relative export performance.*

At 3-digit level, the average RCA index for vegetables (SITC code 054) was 1.2 during the decade. However, the export performance...

In almost half of the years in the decade, the value of RCA index was less than one (see Annex-2).

On the other hand, Pakistan has a clear competitive advantage in fruits. The analysis of this category is performed at a disaggregated level to determine which specific fruit products enjoy comparative advantage.

*e) Only two or three types of fruits, mostly produced in the irrigated Indus plains, dominate Pakistan exports. But the country produces a much wider range of fruits in its diverse agro ecological conditions.*

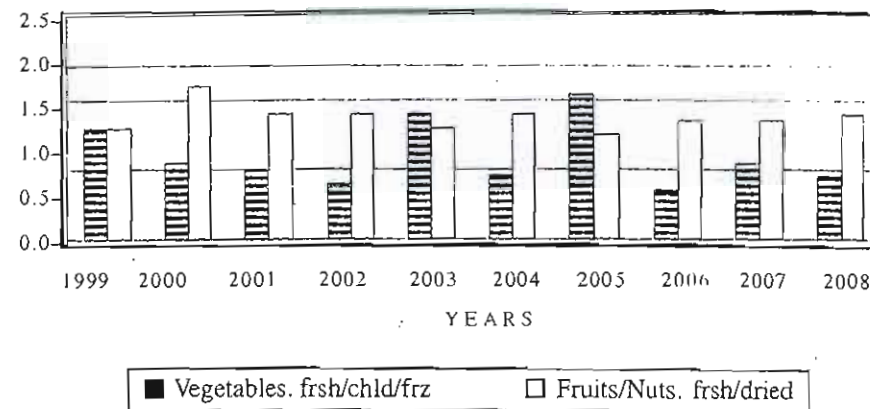
Pakistan's major fruits include citrus, mangos, dates, guava, apples, banana, apricots and grapes. The production of citrus and mango exceeds that of other fruits. Both of them along with Guava are grown in the irrigated part of the Indus Basin. Over the 1999-08 period, average annual production of citrus and mangos was, respectively, 1.9 and 1.3 million tonnes. But the production of other fruits was much lower. For example, the average annual guava production was around 0.5 million tonnes and that of apples was 0.4 million tonnes. The combined annual average production of banana, apricot, and grapes during 1999-08 was 0.4 million tonnes.

One of the reasons for this state of affairs is that modern marketing networks do not exist in many regions of Pakistan. Due to inadequate road infrastructure, access to markets for farmers in mountainous regions in KPK and Balochistan is severely limited. Moreover, adequate cold storage and fruit packaging and processing facilities are not available, and farmers have modest knowledge of post harvest technologies. Finally, there is insufficient support from public research and extension establishments in terms of variety improvements that could increase yields. All these factors provide disincentives for expanding fruit production and ensuring compliance with SPS requirements for exports.

Citrus and mango dominate Pakistan's fruit exports. Many citrus varieties including sweet oranges (Succri, Mausami, Washington Navel, Jaffa, Red Blood, Ruby Red and Valencia Late) and mandarins (Early Feutrells and Kinnow).<sup>6</sup> However, Kinnow mandarins constitute the bulk of citrus exports. Table 4 clearly shows that the relative export performance of citrus varieties other than (Kinnow) mandarins has been poor. Kinnow, on the other hand, had very high RCA index ranging from 4.5 to 29. The values in the more recent years have been higher, indicating growing prospects for trade expansion.

The other important fruit products of Pakistan are mango and guava. Although SITC system does not provide separate codes for mango, guava, and avocados,

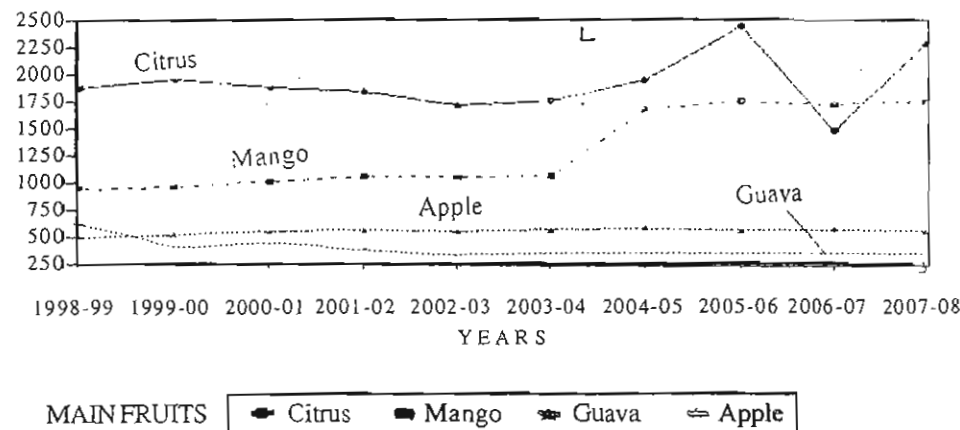
<sup>6</sup> See, [http://www.pakissan.com/english/allabout/orchards/citrus/citrus.basicmajor.citrus.growing\\_areas.shtml](http://www.pakissan.com/english/allabout/orchards/citrus/citrus.basicmajor.citrus.growing_areas.shtml)



Source: SITC data and author's calculations.

FIGURE 3

Revealed Comparative Advantage Index (Balassa): vegetables and fruits



Source: SITC data.

FIGURE 4

Exports of Major Fruits (tons 000)

Pakistani exports under this category consist largely of mangos. In this sub-group relative export performance was very strong. The value if revealed comparative index was always above the threshold level of 1.0 during the decade under consideration. In fact in most years, the value of this index exceeded 10. The highest value of index was 17 in year 2008.

*f) Dates, the only agricultural product where Pakistan enjoys strong comparative advantage and which is produced in all four provinces, offers possibilities of promoting regionally more balanced growth.*

Dates are another agricultural product where Pakistan enjoys overwhelming revealed comparative advantage. The country is the 4<sup>th</sup> largest producer, and the 2<sup>nd</sup> largest exporter, of dates in the world.<sup>7</sup> Dates are grown in all provinces. Aseel, Karbala, Fasli, and Kupro date varieties are found in Sindh. Balochistan's varieties

TABLE 4

Revealed Comparative Advantage Index (Balassa): Selected Fruits

Year	Oranges	Mandarins etc	Dates	Mango/ Guava/Avocado
	fresh or dried SITC (code 05711)	fresh or dried SITC (code 05712)	fresh or dried SITC (code 05796)	fresh SITC (code 5797)
1999	0.3	4.5	81.3	8.3
2000	0.2	6.5	109.2	13.4
2001	0.1	7.6	71.8	13.3
2002	0.0	9.2	78.8	11.1
2003	0.1	7.5	56.6	11.8
2004	0.0	9.6	60.9	12.9
2005	0.0	5.4	46.2	11.4
2006	0.0	12.1	57.2	7.3
2007	0.0	8.4	54.3	10.1
2008	0.0	29.9	56.2	17.0

Source: SITC data and author's calculations.

<sup>7</sup> Jalhani, 2003. Dates: The chief of all fruits in the world

include Begum Jangi, Muzawati, Jann Swore, Kehraba and Rabai, while Dhakki and Gulistan are from KPK.

During 1999-2008 the value of RCA index for dates ranged between 46.2 and 109.2. As dates are produced in all provinces, they offer possibilities for regionally balanced growth. Even within the relatively more prosperous Punjab province, dates are grown in the south which lags behind the rest of the province in several socio-economic indicators. In as much as access to export markets provide higher incomes to farmers, raising productivity of dates production, reducing post harvest losses, and providing modern cleaning and packaging facilities can go a long way in achieving the objectives of poverty alleviation and development of remote areas.

#### IV. Conclusions and Recommendations

##### a) Summary of Findings

Pakistan had strong comparative advantage in export of cereals and cereal preparations (SITC code 04) during the period 1999-08. The value of RCA index for this category was above 8.0 during the 1999-08 period. There was also revealed comparative advantage in export of vegetables and fruits (SITC code 05) as the RCA index for these exports varied between 1.0 and 1.5 during the same period. In contrast to this, exports of meat and meat preparations (SITC code 01), and dairy products and bird's eggs (SITC code 02), did not reveal comparative advantage. The values of RCA indices for both product groups were much below the threshold level of 1.0 throughout the decade.

The robust relative export performance of cereals was led by rice exports (SITC code 042) that had a very high average RCA index value of 66.1. During the second half of the decade, the global food price escalation and Pakistan's ability to export rice at a time when its competitors banned its export, led to further strengthening of the country's relative export performance which was reflected in a very high RCA index value of 146.0 in 2008.

Wheat exports were intermittent because in many years consumption exceeded domestic production. But for most years in which wheat was exported, the RCA index tended to reach levels well above 1.0. Compared to this, the product category 'wheat flour/meal wheat/meslin' (SITC 046) had altogether a different pattern of relative export performance. The RCA index for the category remained at or above 15 in all except 2 years in the decade.

Pakistan's strong comparative advantage in vegetables and fruits category was based on sound relative export performance of both the individual product categories, namely, 'vegetables fresh, chilled and frozen' (SITC code 054) and 'fruit/nuts, fresh/dried' (SITC code 057). Their average RCA indices were, respectively 1.2 and 1.75. The export performance in fruits was dominated by dates, citrus fruits

and mango. The average RCA index for dates was 67.2 during the 1999-08 period. On the other hand, mango exports had average RCA index value of 11.7. The RCA index for the exports of Mandarin (SITC code 05712), locally known as *Kinnow*, was 10.07. The other types of citrus, e.g., oranges (SITC code 05711) had RCA index values that were very close to zero in nearly all years.

### b) Recommendations

Based on the analysis of the paper the following recommendations are made:

1. Relative export competitiveness can be improved through enhancement of yields by introducing new varieties of crops and better breeds of livestock.
  - a) Attempts should be made to increase yields of all major crops, especially wheat rice and cotton, so that exportable surpluses are generated and export competitiveness is improved.
  - b) Priority should be given to developing a commercial seed industry in the country and creating institutional capacities for regulating it.
  - c) More productive livestock breeds that can adjust to local environment should be introduced to boost milk production and exports. Given constraints on area that can be allocated to fodders and on the capacity of rangelands, Pakistan should aim at producing more milk from fewer, high-yielding, well-nourished, and healthy animals.
  - d) Seedless Kinnow mandarins varieties should be developed so that the market in high income countries are penetrated and efforts made to diversify towards other varieties of citrus.
2. Successful strategy for boosting agricultural exports would involve measures aimed at ensuring compliance with SPS requirements, and quality control.
  - a) Pakistan should make serious efforts to ensure adoption of global Good Agricultural Practices (GAP) by the growers of mango, citrus, and other fruits.
  - b) To ensure meeting hygienic standards in meat exports modern abattoirs should be established and development of private meat packing industry encouraged.
  - c) Initially, some disease free areas should be established for livestock. Later animal health coverage should be improved to cover entire animal population.
  - d) Cotton crop should be protected from leaf curl virus that has caused huge loss of export earnings from cotton and cotton products.
  - e) A system of inspections should be put in place to ensure product quality before shipment is made.
  - f) Special efforts need to be made for disseminating post harvest technologies for

3. Agricultural pricing policies should keep domestic prices broadly in line with international prices while at the same time ensuring a degree of price stabilization.
  - a) Rice trades in thin international markets, so there is need for stabilization in the face of international price variability.
  - b) Wheat flour exports are driven by inconsistencies in domestic price policy that subsidize the inefficient wheat milling sector. These policies need to be rationalized.
4. There is need for making more effective export promotion efforts in developed country markets as well as establishing modern domestic marketing networks for producers in remote areas of Pakistan.
  - a) Brand name marketing should be pursued for rice, especially Basmati, and for mango in North American and European markets. For this purpose, linkages with food retailers should be established in the target markets.
  - b) A measure of economic diplomacy maybe used to resolve domestic origin issues in rice.
5. Pakistan exports a limited range of agricultural products that involve low levels of value added. Efforts should be made to move up the value chain and achieve product diversification.
  - a) Greater diversification should be achieved in fruit exports. Instead of exporting only fresh fruits, exports of products involving higher value addition such as juices, pulp, nectar etc should be encouraged.
  - b) Exports of processes dairy products such as powdered butter, cheese, powdered milk should be increased. This requires technical improvements in the food processing sector as well as better adherence to SPS standards.
  - c) Network of cool chains should be established throughout the country to ensure product quality during transportation and handling of perishable products.
  - d) Post harvest technologies for fruits such as dates, apples, pears, figs etc should be disseminated among producers, especially focusing on training women.
  - e) Producers of apples, peaches, grapes etc in Balochistan and other remote areas of the country should be linked through modern marketing channels to major domestic markets.

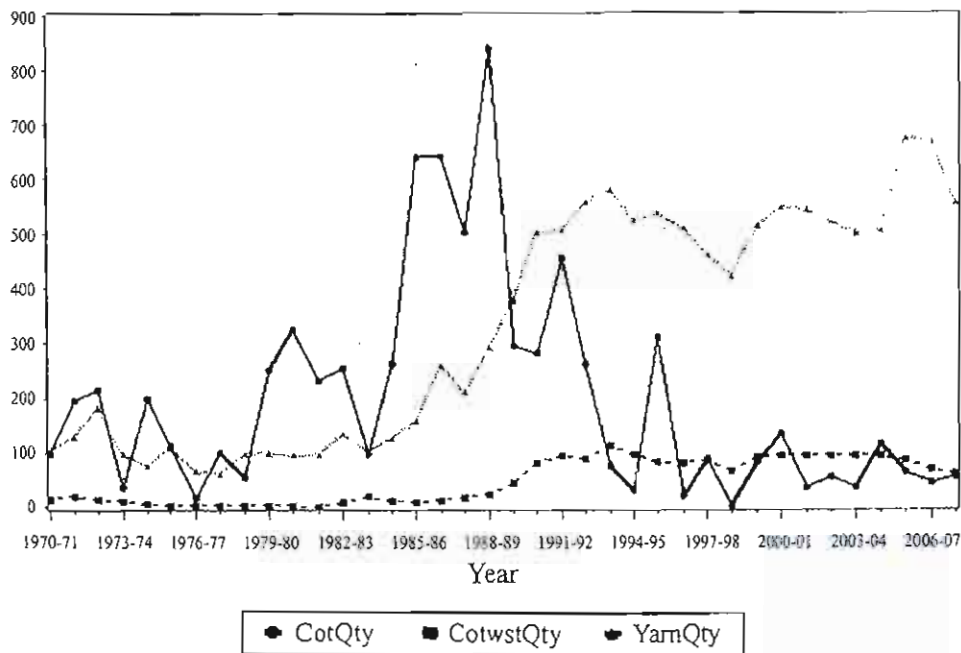


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## APPENDIX-I



Note: CotQty = Cotton quantity (000 metric tons). CotwstQty = Quantity of cotton waste (million kg).

YarnQty = Quantity of cotton yarn (million kg).

Source: Pakistan Economic Survey 2007-08

FIGURE A-1

Pakistan Exports of Cotton and Cotton Products

## APPENDIX-II

A complete listing of RCA Index Values for detailed Product Codes used in this study

Year	Product	Product Name	RCA Index
<u>SITC 2-Digit Products</u>			
1999	01	Meat & preparations	0.1
2000	01	Meat & preparations	0.1
2001	01	Meat & preparations	0.1
2002	01	Meat & preparations	0.1
2003	01	Meat & preparations	0.2
2004	01	Meat & preparations	0.2
2005	01	Meat & preparations	0.2
2006	01	Meat & preparations	0.3
2007	01	Meat & preparations	0.4
2008	01	Meat & preparations	0.3
1999	02	Dairy products & eggs	0.0
2000	02	Dairy products & eggs	0.0
2001	02	Dairy products & eggs	0.1
2002	02	Dairy products & eggs	0.1
2003	02	Dairy products & eggs	0.1
2004	02	Dairy products & eggs	0.1
2005	02	Dairy products & eggs	0.3
2006	02	Dairy products & eggs	0.4
2007	02	Dairy products & eggs	0.4
2008	02	Dairy products & eggs	0.2
1999	04	Cereals/cereal preparatn	7.6
2000	04	Cereals/cereal preparatn	7.6
2001	04	Cereals/cereal preparatn	7.7
2002	04	Cereals/cereal preparatn	7.7
2003	04	Cereals/cereal preparatn	7.3
2004	04	Cereals/cereal preparatn	7.0
2005	04	Cereals/cereal preparatn	10.6

**APPENDIX-II**

(continued)

A complete listing of RCA Index Values for detailed  
Product Codes used in this study

Year	Pro- duct	Product Name	RCA Index
2006	04	Cereals/cereal preparatn	11.1
2007	04	Cereals/cereal preparatn	9.3
2008	04	Cereals/cereal preparatn	9.8
1999	05	Vegetables and fruit	1.2
2000	05	Vegetables and fruit	1.3
2001	05	Vegetables and fruit	1.1
2002	05	Vegetables and fruit	1.0
2003	05	Vegetables and fruit	1.2
2004	05	Vegetables and fruit	1.0
2005	05	Vegetables and fruit	1.3
2006	05	Vegetables and fruit	1.0
2007	05	Vegetables and fruit	1.1
2008	05	Vegetables and fruit	1.1
<u>SITC 3-Digit Products</u>			
1999	011	Beef, fresh/chlld/frozn	0.0
2000	011	Beef, fresh/chlld/frozn	0.0
2001	011	Beef, fresh/chlld/frozn	0.0
2002	011	Beef, fresh/chlld/frozn	0.1
2003	011	Beef, fresh/chlld/frozn	0.1
2004	011	Beef, fresh/chlld/frozn	0.1
2005	011	Beef, fresh/chlld/frozn	0.1
2006	011	Beef, fresh/chlld/frozn	0.2
2007	011	Beef, fresh/chlld/frozn	0.6
2008	011	Beef, fresh/chlld/frozn	0.6
1999	012	Meat nes,fresh/chld/froz	0.1
2000	012	Meat nes,fresh/chld/froz	0.2
2001	012	Meat nes,fresh/chld/froz	0.1

(continued)

**APPENDIX-II**

(continued)

A complete listing of RCA Index Values for detailed  
Product Codes used in this study

Year	Pro- duct	Product Name	RCA Index
2002	012	Meat nes,fresh/chld/froz	0.1
2003	012	Meat nes,fresh/chld/froz	0.2
2004	012	Meat nes,fresh/chld/froz	0.3
2005	012	Meat nes,fresh/chld/froz	0.2
2006	012	Meat nes,fresh/chld/froz	0.3
2007	012	Meat nes,fresh/chld/froz	0.4
2008	012	Meat nes,fresh/chld/froz	0.2
1999	022	Milk pr exc buttr/cheese	0.0
2000	022	Milk pr exc buttr/cheese	0.1
2001	022	Milk pr exc buttr/cheese	0.1
2002	022	Milk pr exc buttr/cheese	0.1
2003	022	Milk pr exc buttr/cheese	0.2
2004	022	Milk pr exc buttr/cheese	0.2
2005	022	Milk pr exc buttr/cheese	0.5
2006	022	Milk pr exc buttr/cheese	0.7
2007	022	Milk pr exc buttr/cheese	0.7
2008	022	Milk pr exc buttr/cheese	0.5
1999	025	Eggs, albumin	0.1
2000	025	Eggs, albumin	0.3
2001	025	Eggs, albumin	0.7
2002	025	Eggs, albumin	0.8
2003	025	Eggs, albumin	0.5
2004	025	Eggs, albumin	0.4
2005	025	Eggs, albumin	0.3
2006	025	Eggs, albumin	0.1
2007	025	Eggs, albumin	0.0
2008	025	Eggs, albumin	0.0

(continued)

**APPENDIX-II**

(continued)

A complete listing of RCA Index Values for detailed  
Product Codes used in this study

Year	Pro- duct	Product Name	RCA Index
2000	041	Wheat/meslin	0.2
2001	041	Wheat/meslin	1.8
2002	041	Wheat/meslin	5.6
2003	041	Wheat/meslin	1.6
2004	041	Wheat/meslin	0.0
2007	041	Wheat/meslin	2.4
2008	041	Wheat/meslin	0.5
1999	042	Rice	48.9
2000	042	Rice	56.3
2001	042	Rice	49.3
2002	042	Rice	44.8
2003	042	Rice	54.0
2004	042	Rice	50.8
2005	042	Rice	70.6
2006	042	Rice	75.5
2007	042	Rice	65.1
2008	042	Rice	146.0
2000	046	Flour/meal wheat/meslin	2.1
2001	046	Flour/meal wheat/meslin	15.3
2002	046	Flour/meal wheat/meslin	19.4
2003	046	Flour/meal whe at/meslin	15.2
2004	046	Flour/meal wheat/meslin	14.9
2005	046	Flour/meal wheat/meslin	25.6
2006	046	Flour/meal wheat/meslin	34.3
2007	046	Flour/meal wheat/meslin	20.5
2008	046	Flour/meal wheat/meslin	0.3

(continued)

**APPENDIX-II**

(continued)

A complete listing of RCA Index Values for detailed  
Product Codes used in this study

Year	Pro- duct	Product Name	RCA Index
1999	054	Vegetables,frsh/chld/frz	1.6
2000	054	Vegetables,frsh/chld/frz	1.1
2001	054	Vegetables,frsh/chld/frz	1.0
2002	054	Vegetables,frsh/chld/frz	0.8
2003	054	Vegetables,frsh/chld/frz	1.8
2004	054	Vegetables,frsh/chld/frz	0.9
2005	054	Vegetables,frsh/chld/frz	2.1
2006	054	Vegetables,frsh/chld/frz	0.7
2007	054	Vegetables,frsh/chld/frz	1.1
2008	054	Vegetables,frsh/chld/frz	0.9
1999	057	Fruit/nuts, fresh/dried	1.6
2000	057	Fruit/nuts, fresh/dried	2.2
2001	057	Fruit/nuts, fresh/dried	1.8
2002	057	Fruit/nuts, fresh/dried	1.8
2003	057	Fruit/nuts, fresh/dried	1.6
2004	057	Fruit/nuts, fresh/dried	1.8
2005	057	Fruit/nuts, fresh/dried	1.5
2006	057	Fruit/nuts, fresh/dried	1.7
2007	057	Fruit/nuts, fresh/dried	1.7
2008	057	Fruit/nuts, fresh/dried	1.8
<u>SITC 4-Digit Products</u>			
1999	0571	Citrus fruit fresh/dried	2.1
2000	0571	Citrus fruit fresh/dried	3.0
2001	0571	Citrus fruit fresh/dried	3.2
2002	0571	Citrus fruit fresh/dried	4.0

(continued)

**APPENDIX-II**

(continued)

A complete listing of RCA Index Values for detailed  
Product Codes used in this study

Year	Pro- duct	Product Name	RCA Index
2003	0571	Citrus fruit fresh/dried	3.3
2004	0571	Citrus fruit fresh/dried	4.2
2005	0571	Citrus fruit fresh/dried	2.6
2006	0571	Citrus fruit fresh/dried	5.6
2007	0571	Citrus fruit fresh/dried	4.1
2008	0571	Citrus fruit fresh/dried	8.5
<u>SITC 5-Digit Products</u>			
1999	05711	Oranges, fresh or dried	0.3
2000	05711	Oranges, fresh or dried	0.2
2001	05711	Oranges, fresh or dried	0.1
2002	05711	Oranges, fresh or dried	0.0
2003	05711	Oranges, fresh or dried	0.1
2004	05711	Oranges, fresh or dried	0.0
2005	05711	Oranges, fresh or dried	0.0
2006	05711	Oranges, fresh or dried	0.0
2007	05711	Oranges, fresh or dried	0.0
2008	05711	Oranges, fresh or dried	0.0
1999	05712	Mandarins etc frsh/dried	4.5
2000	05712	Mandarins etc frsh/dried	6.5
2001	05712	Mandarins etc frsh/dried	7.6
2002	05712	Mandarins etc frsh/dried	9.2
2003	05712	Mandarins etc frsh/dried	7.5
2004	05712	Mandarins etc frsh/dried	9.6
2005	05712	Mandarins etc frsh/dried	5.4

(continued)

**APPENDIX-II**

(continued)

A complete listing of RCA Index Values for detailed  
Product Codes used in this study

Year	Pro- duct	Product Name	RCA Index
2006	05712	Mandarins etc frsh/dried	12.1
2007	05712	Mandarins etc frsh/dried	8.4
2008	05712	Mandarins etc frsh/dried	29.9
1999	05796	Dates, fresh/dried	81.3
2000	05796	Dates, fresh/dried	109.2
2001	05796	Dates, fresh/dried	71.8
2002	05796	Dates, fresh/dried	78.8
2003	05796	Dates, fresh/dried	56.6
2004	05796	Dates, fresh/dried	60.9
2005	05796	Dates, fresh/dried	46.2
2006	05796	Dates, fresh/dried	57.2
2007	05796	Dates, fresh/dried	54.3
2008	05796	Dates, fresh/dried	56.2
1999	05797	Avocado/mango/guava frsh	8.3
2000	05797	Avocado/mango/guava frsh	13.4
2001	05797	Avocado/mango/guava frsh	13.3
2002	05797	Avocado/mango/guava frsh	11.1
2003	05797	Avocado/mango/guava frsh	11.8
2004	05797	Avocado/mango/guava frsh	12.9
2005	05797	Avocado/mango/guava frsh	11.4
2006	05797	Avocado/mango/guava frsh	7.3
2007	05797	Avocado/mango/guava frsh	10.1
2008	05797	Avocado/mango/guava frsh	17.0