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ABSTRACT

This study analyses the demand and supply side determinants of textile and garments' exports of Pakistan using time series data for the period 1972–2010. Eight trading partners (US, UK, Canada, Italy, France, Japan, Spain and UAE) contributing major share in this trade have been selected for analysis. The demand and supply side factors have been examined using the simultaneous equation approach and the Generalised Method of Moment to handle the simultaneous equation bias. The results reveal that the income of the trading partners has an important and significant role in determining performance of textile and clothing exports of Pakistan. The relevance of devaluation policy in accelerating demand for this export has been found to be comparatively small. On the supply side, the relative prices and the capacity variable are important. The results of the exports supply equation show that the removal of quantitative restrictions does not provide any incentive to the suppliers. However, the real wages in the textile sector have a significant but small effect on the supply. The demand for textile and clothing products of Pakistan is relatively high in UK, UAE, Italy and USA (as indicated by high income elasticities), therefore, factors that help in the expansion of textile and clothing products in the local market and the marked countries should receive special attention of the policy makers.

Keywords: Demand and Supply of Textiles and Clothing; Simultaneous Equation; Real Effective Exchange Rate

1. INTRODUCTION

Over the years, exports have played an important role in the economic growth of developing countries as aptly expressed in the well known words of Roberston who has called trade as "an engine of growth". Some newly industrialised countries (NICs)—(Korea, Taiwan and Singapore)—which shifted their import substitution policies to export promotion policies to promote the exports of the manufacturing sector have done remarkably well. This success of the NICs proved "elasticity pessimism" to be wrong and induced other developing countries to replicate the same outward-oriented strategy of export-led growth. The export performance of any country depends on many price and non-price factors.

The debatable issue is whether other developing countries like Pakistan could also make similar gains from an outward oriented growth strategy. It is pointed out by Riedal (1984, 1988) that the massive growth of the NICs is due to domestic incentives and supply side factors rather than external demand side factors since countries compete in the international market on the basis of prices. Muscatelli, *et al.* (1992, 1995) pointed out that growth of manufacturing exports depends on the importing countries' incomes i.e., the absorption capacity of the international market. Malik (2000) supports Riedal and concludes that the successful countries are able to differentiate their products in the international market by focusing on modern techniques of production, training and manpower.

There are several sectors on whose productivity and growth economic prosperity and welfare depend. The most important is textile sector which has always played an important role in the economic growth of developed and developing countries. Trade in textile and clothing sector has increasingly been subject to protection through bilateral trade agreements like the Multi Fibre Agreement (MFA) which was effective from 1974-1994. It was replaced by the Agreement on Textile and Clothing (ATC) which gave member countries a 10-year time period (1995-2005) to eliminate the restrictions gradually in four stages and to bring trade in textile and clothing under the general GATT rules.

The textile and clothing sector is the major industrial sector of Pakistan. Its contribution to total exports, employment, foreign exchange earnings, investment and value added makes it the country's single largest manufacturing sector. It contributes around 46 percent in manufacturing output, accounts about 60 percent in export earnings and absorbs approximately 39 percent of the manufacturing labour force.

The textile and clothing industries have backward and forward linkages in other sectors of the economy and in other production processes within the industry. Many textile outputs such as cotton and cotton yarn are used as inputs in the production of other final outputs (such as carpets, cloths and industrial textile), and in other industries like furniture and automobiles. The climate of Pakistan is suitable for the production of this industries' important inputs—cotton and wool. Pakistan has traditionally remained stuck in the early stages of production and trade of these inputs and has not taken advantage of using these inputs in the production of value added goods. Although this sector is very important on the national level but its share in world exports continues to be very small.

The structure of textile and clothing trade has undergone a number of changes at the international and national levels during the past few years. Among the major examples are changes in the pattern of consumer expenditure, easing in protective curbs. Allowing greater access to the international market, increased share of developing countries in the world textile and clothing exports and incentives provided by the Government to encourage producers. These changes have significantly influenced the magnitude and structure of textile and clothing industry. According to studies [Goldstein and Khan (1978), Muscatelli, *et al.* (1992), Hassan and Khan (1994) and Atique and Ahmed (2003)] it has been found that the demand and supply sides are the major determinants of exports but the factors affecting the exports of this sector have received scant attention. Therefore, proper understanding of demand and supply side determinants of this important sector is an urgent need. The export performance of this sector has initially been analysed focusing on the demand side factors on the assumption that the supply side was infinitely elastic. Later on both demand and supply side elasticities were estimated. These studies generated biased estimates because both demand and supply side equations were not correctly specified. Keeping this in view, the simultaneous equations model has been specified to incorporate the endogeniety problem in the demand and supply of textile and clothing exports. Eight major trading partners (US, UK, Canada, Italy, France, Japan, Spain and UAE) have been selected for the analysis of disintegrated textile and clothing exports.

The study contributes to the existing empirical literature in several ways. Besides providing a detailed overview of the textile and clothing sector at the disaggregated level, it also adds policy variables like real devaluation/ depreciation of domestic currency *vis-à-vis* the trading partner's currency and removal of trade restriction regime in the demand and supply framework. The Real Effective Exchange Rate is calculated which captures the effect of devaluation from outside the model and GMM is used to address simultaneity. It also highlights several factors which affect this sector's demand and supply. These factors are important for investors and policy makers to bring positive changes in the production and exports of this sector.

The main objective of the study is to analyse the impact of demand and supply side determinants on the textile and clothing exports of Pakistan and evaluate their relative importance in export performance. It is generally believed that real devaluation of domestic currency as against the currency of the competitor helps to accelerate export performance. A few evidences contrary to this view are also present in the literature [Vermani (1991), Malik (2000), Akhtar and Malik (2000) and Atique and Ahmed (2003)]. Therefore, the objective in this case is to see the impact of real devaluation on the textile and clothing exports of Pakistan.

Recently, the non-tariff restrictions on textile and clothing exports have been removed in four phases under the ATC. It is expected that the removal of these restrictions would provide exporters with greater access to the international markets and enable them to expand the quantum of their supplies [Malik (2000)]. Therefore, the final objective is to examine whether the removal of MFA restrictions encourages domestic suppliers to increase the quantum of their exports or not.

The study is organised as follows. After the introduction, the structure of the textile and clothing sector's exports is discussed in Section 2. The relevant literature on the exports' determinants is presented in Section 3. The model, methodology and data sources are discussed in Section 4. The discussion and analysis of the results are given in Section 5. The final section of the study includes the conclusion and policy implications.

2. OVERVIEW OF EXPORT PERFORMANCE FOR TEXTILE AND CLOTHING SECTOR OF PAKISTAN

The textile and clothing sector is a major contributor to the growth of Pakistan's economy. Basically an agricultural country, Pakistan has domestic availability of raw materials like cotton and wool which feed the textile and clothing industry and ensure its unimpeded growth. It contributes 46 percent in total manufacturing and 60 percent in total exports. Besides this, 38 percent of the labour in the manufacturing sector is employed in textile and clothing factories [Economic Survey (2010-11)]. This reflects the importance of the textile and clothing industry in the country's manufacturing sector.

The worldwide trade in textile and clothing has increased from US$ 524 billion in 2009 to US$ 602.2 billion in 2010. Pakistan's exports have also increased from US$ 9.9 billion in 2009 to US$ 11.8 billion in 2010. The composition of world textile exports is different as compared to textile exports of Pakistan. Table 1 shows that the share of the textile sector (66.10 percent) is greater than the clothing sector (33.05 percent) in the total exports of Pakistan. However, the pattern in world textile and clothing exports is different. The share of clothing in exports is greater at 58.36 percent compared to textiles at 41.63 percent. This behaviour reflects the rapid growth in the value added sector of

clothing in world exports. The growth in Pakistan's textile and clothing exports is mainly driven by low value textile items. The reasons for this trend are discussed below.

Table 1

Textile and Clothing Exports (2010)

(US$ billion)

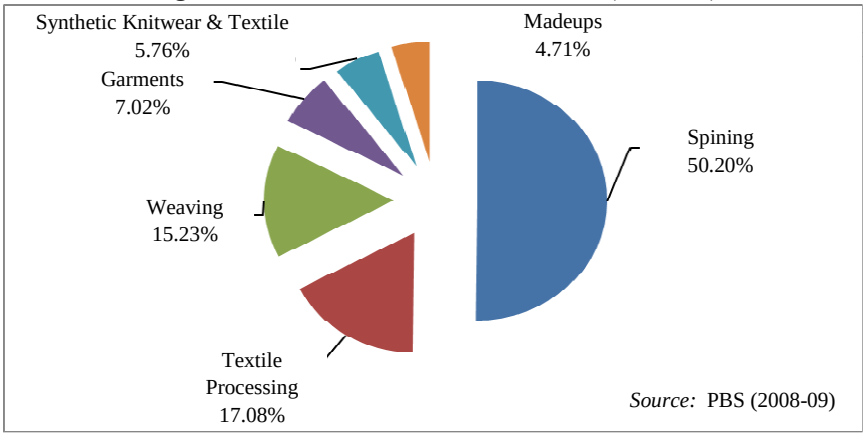
	World	% Share	Pakistan	% Share
Textile	250.7	41.63	7.8	66.10
Clothing	351.5	58.36	3.9	33.05
Total	602.2		11.8	

Source: Pakistan Economic Survey 2011-12.

2.1. Investment Behaviour in Textile and Clothing Industry

Figure 1 illustrates the share each of textile and clothing sectors in the total investment ($7 billion) during 1999-2008: more than 50 percent of total investment has been allocated for the spinning sector followed by textile processing and weaving sectors [Economic Survey (2007-08)]. Despite the larger international demand, readymade garments have a smaller share in total investment expenditures of Pakistan.

Fig. 1. Sector-wise Share in Investment (1999–08)



2.1.1. *Spinning Sector*

The share of spinning sector in total investment is more than 50 percent, which has been growing consistently. Another significant process is *Cotton Spinning*, which is a process of converting raw cotton into yarn (thread). The major share of good quality yarn from Pakistan is exported to other countries (Japan, South Korea and Hong Kong, etc.), instead of turning it into value added

products (fabrics and readymade garments). At the time of independence, Pakistan had only two textile and clothing mills, now Pakistan is the third largest supplier of cotton yarn having 521 spinning mills.[1] Table 2 reports that the number of spindles increased from 3236 thousand in 1972 to 11366 thousand in 2009. Yarn has a low price in the international market but it has a large share in production and exports of Pakistan.

Table 2

Number of Spindles in Spinning Sector

Years	No. of Spindles (x1000)	Years	No. of Spindles (x1000)	Year	No. of Spindles (x1000)
1972-73	3226	1985-86	4422	1997-98	8368
1973-74	3308	1986-87	4293	1998-99	8392
1974-75	3392	1987-88	4330	1999-00	8477
1975-76	3478	1988-89	4790	2000-01	8601
1976-77	3544	1989-90	5195	2001-02	9060
1977-78	3560	1990-91	5493	2002-03	9260
1978-79	3704	1991-92	6141	2003-04	9499
1979-80	3731	1992-93	6768	2004-05	10941
1980-81	3983	1993-94	8182	2005-06	11292
1981-82	4180	1994-95	8307	2006-07	11266
1982-83	4265	1995-96	8493	2007-08	11834
1983-84	4224	1996-97	8137	2008-09	11366
1984-85	4396				

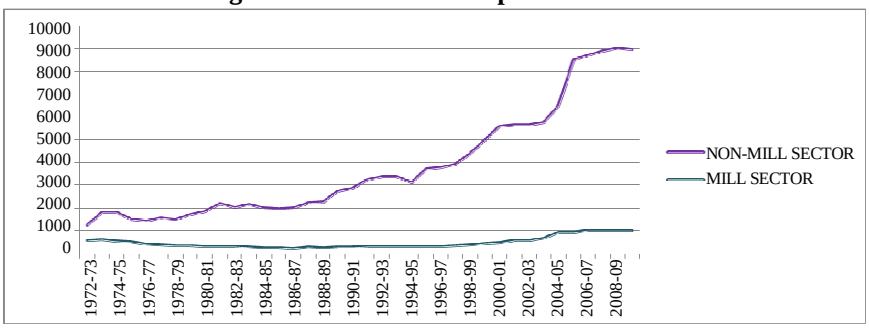
Source: APTMA.

2.1.2. *Cotton Cloth Sector*

The structure of the weaving sector in Pakistan is very different from the spinning sector. Figure 2 shows that more than 50 percent of cotton cloth is produced in the unorganised mill sector. The clothing sector is producing four categories of fabrics: (1) blended fabrics, (2) bleached fabrics, (3) dyed & printed fabrics and (4) grey fabric. Figure 3 shows that grey fabric contributes more than 50 percent of the total cloth production as compared to other categories. About 50-80 percent of total cloth production is used in domestic market and only 20-40 percent is exported. Dyeing and printing add more value to the grey fabric and hence it has greater demand in international markets. However, it requires more capital and skilled labour, therefore, production and exports of this category is comparatively low in Pakistan [Khan (2003)]. The number of looms in the organised mill sector has decreased from 29,000 to 8,000 in the last 30 years and only half of them are actually in real working condition (Statistical Supplement and Economic Survey of Pakistan). The Multi Fiber Agreement (MFA) had also adversely affected the clothing sector in Pakistan. Government encourages production in the unorganised mill sector to obtain the benefit of low cost production. It helps in increasing the production of low quality power looms at the cost of the organised mill sector.

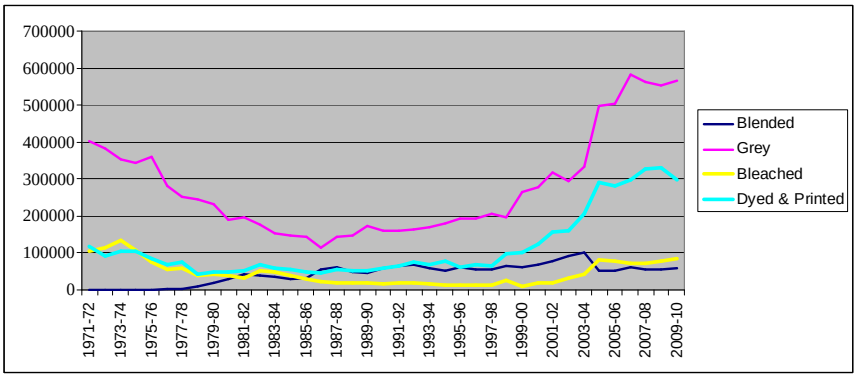
[1]Textile and clothing trade 2007-08, Ministry of Textile Industry.

Fig. 2. Production and Exports of Cloth[2]



Source: APTMA.

Fig. 3. Category Wise Share in Total Cloth Production[3]



Source: APTMA.

2.1.3. *Readymade Garments*

The readymade garments sector is the highest value added sector of the textile and clothing industry. Small and medium scale units with 50 or less machines per unit are its major producers [Economic Survey (2010-11)]. This sector also suffers from technological backwardness which makes it product sell cheap in the international market. The readymade garments industry has the advantage of duty-free import of machinery and exemption of income tax.

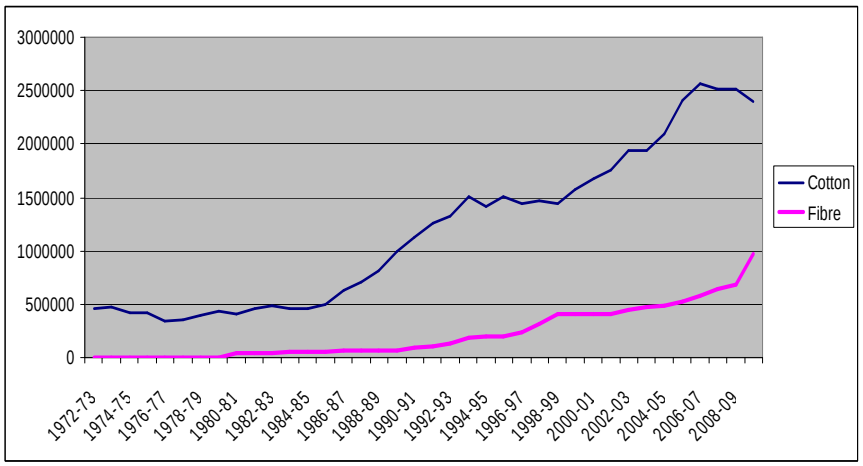
2.1.4. *Man-Made Fiber (MMF) / Synthetic Textile*

The application of man-made fibre in textile and clothing production is increasing with the passage of time because it has more lifetime and better quality against cotton textiles. The use of MMF is marginal in textile and clothing products of Pakistan. Figure 4 shows that consumption of synthetic

[2]Data used in figure is given in Appendix 1A.
[3]Data used in figure is given in Appendix 1B.

fibre was zero in production of textile products in Pakistan before 1980-81. But subsequently it started increasing and highest at 45 percent and 43 percent during 1993-94 and 2009-10 respectively, whereas the share of cotton consumption has remained at more than 70 percent over the review period.

Fig. 4. Consumption of Cotton and Man Made Fibre in Textile Production[4]



Source: APTMA.

Table 3 represents the percentage share of cotton & cotton textiles, synthetic textile and wool and woollen textiles in total textile exports. The share of synthetic textiles increased from 3.89 percent to 4.31 percent during the fiscal year 2006-07 through 2009-10. Cotton and cotton textiles had the highest contribution and wool and woollen textiles the lowest in total textile exports respectively.

Table 3

Pakistan's Textile Exports

(US$ million)

	2006-07	2007-08	2008-09	2009-10
Cotton & Cotton Textile (%ge)	94.00	93.45	95.25	94.36
Synthetic Textile (%ge)	3.89	4.55	3.26	4.31
Wool & Woollen Textile (%ge)	2.11	2.00	1.48	1.33
Total Textile	100	100	100	100

Source: Economic Survey of Pakistan 2011-12.

[4]Data used in figure is given in Appendix 1C.

2.2. Comparison with Other Competitors

An overview of the textile and clothing exports from major Asian textile and clothing producers over the period 2000-10 is given in Table 4. Textile exports of Pakistan show a somewhat mixed trend over the decade, its share in the world's textile and clothing exports has increased from 1.95 percent in 2001 to 2.23 percent in 2005. Afterwards, its share in world market starts declining[5] to 1.81 percent in 2008 registering but only a slight improvement in later years. Pakistan's compound growth rate over the same period has been 7.64 percent per annum. Although textile and clothing exports have had a positive growth over the decade but its share in world exports is still quite meagre.

Pakistan is facing major competition from China, the major exporter of textiles and clothing with shate in world exports of 15.67 percent in 2001 increasing to 34.34 percent in 2010. After the removal of quantitative restriction in 2005, China gained almost 10 percent additional share in textile and clothing exports of the world with per annum compound growth rate of 29.60 percent, the highest among other competitors. India is the second major exporter in Asia with 3.28 percent total share in 2000 increasing to 4.01 percent in 2010. Its compound growth rate is 10.86 percent per annum with smooth upward trend compared to Pakistan. The share of Bangladesh exports has increased to 2.81 percent in 2010 from 1.54 percent in 2000. Its textile and clothing exports have a smooth trend per annum of 20.99 percent. This may be due to the preferential treatment Bangladesh has been receiving from the EU countries under the General System of Preferences (GSP) and the increasing share of readymade garments in its exports.

Table 4

Comparison of Pakistan's Textile and Clothing Exports with Asia

(US$ million)

Countries / Years	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Growth Rate per Annum (%)
World	341166	356870	405301	453786	478405	525465	583302	612028	525336	602116	70.95
Bangladesh	5238	5314	6067	6893	7595	9812	9739	12010	13411	16923	209.95
Share in World Exports (%)	*1.54*	*1.49*	*1.50*	*1.52*	*1.59*	*1.87*	*1.67*	*1.96*	*2.55*	*2.81*	
China	53475	61864	78961	95284	115213	144057	171552	185772	167088	206738	296.00
Share in World Exports (%)	*15.67*	*17.34*	*19.48*	*21.00*	*24.08*	*27.42*	*29.41*	*30.35*	*31.81*	*34.34*	
India	11011	11645	12750	14332	17070	18444	19547	21340	21116	24118	108.67
Share in World Exports (%)	*3.23*	*3.26*	*3.15*	*3.16*	*3.57*	*3.51*	*3.35*	*3.49*	*4.02*	*4.01*	
Pakistan	6661	7018	8521	9151	10691	11376	11177	11092	9867	11778	76.42
Share in World Exports (%)	1.95	1.97	2.10	2.02	2.23	2.16	1.92	1.81	1.88	1.96	

Source: World Trade Organisation (WTO).

[5]During this time, textile and clothing trade was under General Agreement on Tariffs and Trade (GATT) and quantitative restriction had been removed.

2.3. Concentration of Textile and Clothing Exports

The percentage share of major textile and clothing export categories and their growth rates with respect to total exports (1972-2010) are reported in Table 5. Raw cotton, cotton yarn, cotton cloth and readymade garments have major shares in total exports of Pakistan. Raw cotton has large contribution in total exports during 1972-80 and 1981-90 but its share has decreased in the last two decades. Exports of raw cotton showed good performance during 1972-1980 as compared to the last two decades. The average share of cotton yarn has improved to 16.60 percent in 1991-2000 against 12.53 percent in 1972-80 but\it decreased in the following years. Exports of cotton yarn showed excellent performance during 1981-90. The average share of cotton thread decreased to 0.01 percent in 2001-08 against 0.42 percent in 1972-80 whereas the share of synthetic textiles increased to 6.57 percent in 2001-08 compared to 0.49 percent in 1972-80. This category has shown comparatively better performance during the second and third decades of the review period.

Cotton cloth has large average share in total exports over the review period; the highest growth rate was 40.2 percent in 1981-90 against 13.57 percent during 2001–08. The exports of readymade garments have continuously increased over the last four decades and have 19.04 percent contribution in total exports in 2001–08 against 2.27 percent in 1972–80. This makes the performance during 1981–90 Outstanding. The share of raw material exports has shown a declining trend while value added exports have increased over time as already shown in Table 5.

Table 5

Concentration of Exports[6]

	1972-1980		1981-1990		1991-2000		2001-08	
	%Share	Growth	% Share	Growth	% Share	Growth	% Share	Growth
Raw Cotton	8.76	23.03	12.80	8.35	3.00	–6.06	0.51	–11.81
Cotton Waste	0.19	–4.83	0.26	304.21	0.67	5.03	0.31 as	1.08
Cotton Yarn	12.53	0.62	10.71	77.40	16.60	10.80	8.79	3.65
Cotton Thread	0.42	14.01	0.20	–3.56	0.04	–1.31	0.01	74.79
Cotton Cloth	12.99	11.72	10.67	40.20	13.50	27.34	12.22	13.57
Synthetic	0.49	–0.65	3.60	25.81	6.57	20.35	3.41	–2.51
Readymade Garments	2.27	81.70	7.99	182.49	16.66	36.00	19.04	13.11

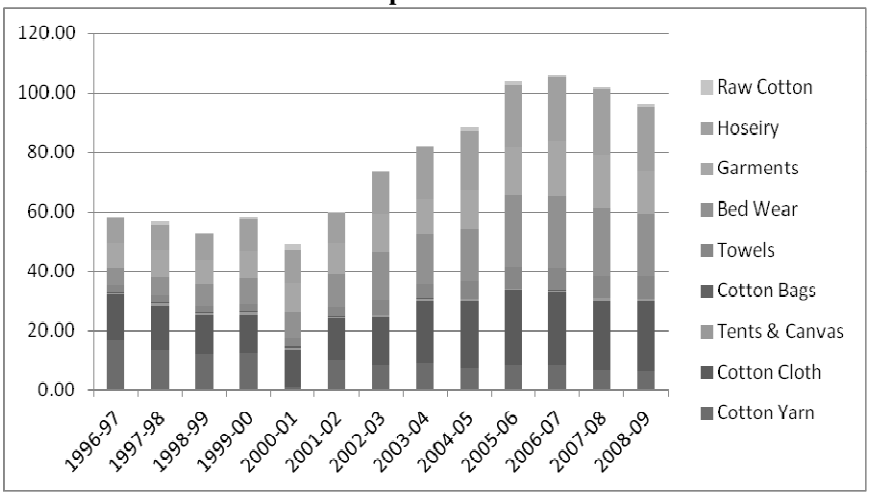
Source: Statistical Supplement and Economic Survey of Pakistan.

[6]Due to the problem of data availability in similar pattern for 1972-2010, this table consists of few components not all textile exports categories.

2.4. Composition of Textile and Clothing Exports

Overall, textile and clothing exports have grown over the decade, as shown in Table 4. The percentage change in the value of each category from 1996 to 2009 is given in Figure 5**.** It explains that the share of value added the products (readymade garments, cotton cloth and knitwear) depicts an increasing trend over time. The share of cotton cloth exports has an increasing trend during 1996–2006 but a declining trend has also been observed in last three years. The share of the highest value added category i.e. the readymade garments has increased with slow pace over the period, whereas the share of the comparatively less value added category like hosiery has increased sharply in total textile exports. The share of raw materials like cotton yarn has decreased over the period, but its production has increased (section 2.2.2). It shows that the larger share of yarn production goes to manufacturing of cloth. The share of raw cotton, tents & canvas and cotton bags is almost consistent over time. In contrast, the share of towels exports shows an increasing trend as well as the share of bed-wear exports.

Fig. 5. Percentage Share in Value of Each Category in Total Textile Exports



Source: APTMA.

Table 6 presents the percentage share and growth rate of major textile and clothing export categories, over four decades. The category wise, in-depth analysis of exports and percentage change for fiscal years 2007-10 is presented below. It explains the export growth of different categories in competitive environment after the removal of quantitative restrictions. There is more than 50 percent increase in exports of three categories, raw cotton, yarn other than cotton yarn and art silk and synthetic textiles.

Table 6

Category Wise Exports of Pakistan

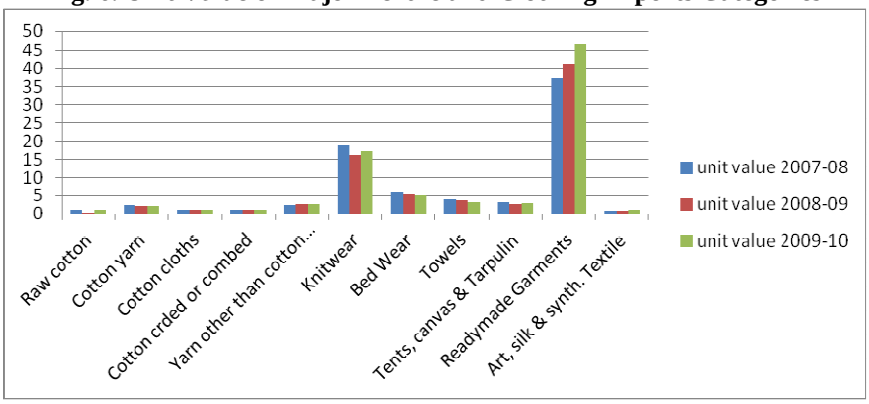
	Unit	Value in US$ Million 2007-08	2008-09	2009-10	% Change (2007-08 to 2008-09)	% Change (2008-09 to 2009-10)
Raw Cotton	MT	38,509	72,636	157,962	88.62	117.47
Cotton Yarn	MT	419,528	379,597	500,130	–9.52	31.75
Cotton Cloths	*TH.SQM*	*1,437,467*	*1,496,972*	*1,256,944*	4.14	–16.03
Cotton Carded or Combed	MT	12,207	14,374	8,628	17.75	–39.97
Yarn Other Than Cotton Yarn	MT	15,366	7,140	13,203	–53.53	84.92
Knitwear	*TH.DOZ*	*73,913*	*81,224*	*74,711*	9.89	–8.02
Bed Wear	MT	247,898	238,526	243,099	–3.78	1.92
Towels	MT	106,680	124,539	155,663	16.74	24.99
Tents, Canvas and Tarulin	MT	17,714	16,984	17,088	–4.12	0.61
Readymade Garments	*TH.DOZ*	*28,250*	*22,129*	*20,336*	–21.67	–8.10
Art, Silk and Synth. Textile	TH.SQM	362,351	222,546	336,337	–38.58	51.13
Made up Articles	–	0	0	0	0	0
Other Textile Materials	–	0	0	0	0	0

Source: Economic Survey of Pakistan.

The articles in category Art, Silk and Synthetic Textile rank 3rd in textile exports, cotton yarn also shows significant growth rate of 31.75 percent. Readymade garments, cotton cloth and knitwear are important value added categories but their exports have declined by 8.10 percent, 8.02 percent and 16.03 percent respectively. Textile and clothing exports mainly consist of cotton yarn, cotton cloth, knitwear, bed wear and readymade garments. Analysis in Table 6 reveals that Pakistan is unable to clearly diversify in textile and clothing export, and unable to take much advantage of cotton base and more focus is given to exporting raw material products (cotton and cotton yarn etc.). Whereas, value added products contribute small part in total textile exports. Therefore, positive trend in the total textile and clothing exports is due to growth in low value products at the cost of finished products.

Unit values are calculated by using export quantities and export values of the respective categories, reflected in Table 6. While unit value of major textile and clothing exports for three fiscal years (2007-08, 2008-09 and 2009-10) are shown in Figure 6. Readymade garments and knitwear has high unit value for exports despite of their decreasing share in total exports. The share of bed wear exports has also decreased over the period but unit value has increasing trend. At the same time, the prices of other raw material categories (cotton, cotton yarn and yarn other than cotton yarn) have decreased in international market. These categories have a major share in total exports and exhibit more than 50 percent growth over the period concerned.

Fig. 6. Unit Value of Major Textile and Clothing Exports Categories



Source: Economic Survey of Pakistan.

2.5. Textile and Clothing Exports Destination

The principal buyers of textile and clothing exports of Pakistan in two fiscal years 2007-08 and 2008-09 are discussed in Table 7. The major share of Pakistan's textile goods was exported to USA followed by UK during the last

Table 7

Principal Buyers of Textile and Clothing Exports from Pakistan

(US$ Million)

	2007-08 (Textile and Clothing Exports)		2008-09 (Textile and Clothing Exports)	
Countries	Value	Percentage in Total	Value	Percentage in Total
USA	3,303,455	31.2	2,925,545	30.6
UK	783,749	7.4	678,592	7.1
Germany	598,549	5.7	547,440	5.7
China	368,437	3.5	457,414	4.8
Italy	471,616	4.5	385,168	4
Bangladesh	255,319	2.4	334,342	3.5
Spain	422,085	4	327,980	3.4
UAE	379,852	3.6	324,872	3.4
Belgium	319,601	3	321,600	3.4
Turkey	331,915	3.1	304,380	3.2
Netherlands	352,777	3.3	293,778	3.41
Hong Kong	397,900	3.8	282,674	3
France	260,659	2.5	228,946	2.4
Saudi Arabia	135,919	1.3	169,618	1.8
South Africa	200,604	1.9	136,218	1.4
Canada	149,197	1.4	132,530	1.4
Portugal	150,139	1.4	113,480	1.2
Sri Lanka	127,023	1.2	105,405	1.1
South Korea	91,041	0.9	91,182	1
Australia	95,123	0.9	84,768	0.9
Rest World	1,376,857	13	1,318,458	13.8
Total	10,571,817	100	9,564,390	100

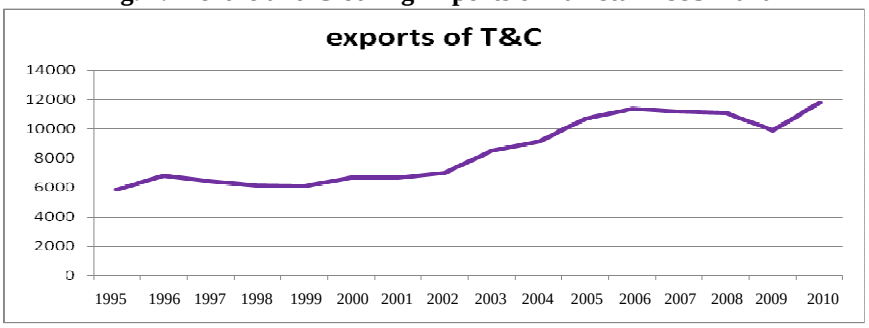
Source: APTMA.

two fiscal years. Their share in Pakistan's total textile exports is 30.6 percent and 7.1 percent respectively during fiscal year 2008-09. Germany and China are the 3rd and 4th largest buyers of Pakistani textile and clothing exports having 5.7 percent and 4.8 percent share in total exports respectively. Then follow Bangladesh, Spain, UAE, Belgium, Turkey, Netherlands, Hong Kong and France. The remaining world has less than 2 percent contribution in Pakistan's total textile exports. The share of China, Bangladesh, Belgium, Turkey, Netherlands and Saudi Arabia has slightly increased over the recent period. The share of the remaining countries has either decreased or has been constant which clearly shows Pakistan's inability to expand its textile exports more than 50 percent of which remains tied to five countries only.

2.6. Trade Openness

The textile and clothing exports from developing countries remained constrained by the Multi-Fibre Agreement (MFA) from 1974-94 whose main purpose was to protect the textile and clothing industries of the developed countries. The EU and USA, Pakistan's major buyers, imposed quota restriction on 15 and 39 categories respectively [Textile Vision (2005)]. In 1994, the Uruguay Round removed non-tariff restrictions on textile and clothing trade and brought it under GATT rules. Ten years were given to both exporters and importers to adjust to this new phase of international trade, under ATC. It was expected that the removal of quantitative restrictions would bring significant improvement in textile and clothing exports of Pakistan [Khan and Mahmood (1996), Ingco and Winters (1995) and Trela and Whalley (1990)]. But there was no significant improvement even after 15 years of the quota abolishing regime. It is obvious that only those countries will survive in the post quota regimes which can perform in the presence of quantitative restrictions such as China [Malik (2000)]. The analysis of data given in Figure 7 shows that the decision to end non-tariff barriers has not been very beneficial in the face of tough competition from other developing countries.

Fig. 7. Textile and Clothing Exports of Pakistan 1995–2010



Source: WTO.

Meanwhile the developed countries have devised other barriers to protect their domestic textile industries. These barriers can be broadly divided into three categories: (1) Using different standards regarding product quality and processes, (2) Applying different standards to the hygiene and environment maintained by manufacturers, and (3) checking for intermediate processes harmful to the environment [Khan (2003)]. They employ two other strategies against imports from developing countries.

One is the *Demand for market* strategy by which the developed countries increase demand for their products by producing high quality fashion clothes. After developing consumer demand through advertisement and product diversification, they shift the high cost burden towards the consumers.. The second is a *supply-based* strategy which employs the cheap labour of developing countries to produce labour-intensive textile products at a low cost. Developed countries get these products without any quota restriction under buy back agreements; this is called outward processing [Malik (2000) and Khan (2003)].

3. LITERATURE REVIEW

A large body of empirical literature has examined the factors which determine the supply and demand of manufactures in general and textiles in particular. After the inception of WTO and reduction of quota's and application of Most Favoured Nation (MFN) status it has become an important area of research. This section briefly reviews some relevant studies in this area:

Riedal (1988) examined simultaneously the demand and supply sides' equations for quarterly data from 1972–84. The demand side parameters for Hong Kong resemble that of other countries but the supply side determinants vary from country to country according to domestic conditions such as industrial policy and wage rate. Findings of new models strongly contradict the previous consensus views and indicate that the volume of exports is determined by its ability to compete in the world market on the basis of prices; the factor of world income has but a minor effect on the export volume.

Amazonas and Barros (1996) test the demand and supply function for Brazil's manufacturing exports using the instrumental variable method of Philips and Hansen (1990). The results show that income elasticity of demand is low and insignificant which indicates that Brazil has to build its competitiveness in the international market. The combined effect of subsidies and exchange rate has been observed to be negative on exports. Industrial productivity is an important determinant; it affects the competitiveness of manufacturing exports.

Muscatelli, *et al.* (1992) estimate price and income elasticity for Hong Kong exports using ECM and modified OLS estimates. The results show that both long-run price and income have significant effect on export demand. The adoption of new production and marketing techniques can be beneficial for the export growth of a country. The increase in the productive capacity of the

economy will automatically create a proportionate world income for the exported commodity of the country. The export volume turns out to be insignificant but unit labour cost and import price elasticities have a significant role in the determination of export supply.

Abbott and Vita (2002), analyse manufacturing exports from the NICs using structural cointegrating VAR approach for simultaneous estimation of structural parameters. The hypothesis of high price and income elasticity could not be rejected since relative prices and income seem to play an important role in determining the export growth of Hong Kong.

Muscatelli, *et al.* (1995) estimate the supply and demand functions for the manufacturing exports of a group of newly industrialised countries (Hong Kong, Taiwan, Thailand, Singapore, Malaysia and Korea) separately. The study addresses the issue of structural changes in the exports of newly industrialised countries. A structural model is estimated by using the systems method that includes lags for the unrestricted reduced form equation. Export prices have the expected positive and domestic prices the negative impact on export supply for all countries. The results of the study show that capital stock plays an important role in all countries. Singapore is an emerging country in world trade and has attained sustainable growth despite currency appreciation and the South Asian crises. However, Arize (1999) has pointed out that high export growth is due to cheap availability of imported intermediate goods for exporters. Secondly, economic, social and political stability in Singapore leads to sustainable export growth. The Johansen cointegration test is used to test long run relationship between variables and the results show that demand for Singapore exports is elastic for foreign economic activity and cross-prices and inelastic for own price.

Virmani (1991) has estimated demand and supply function for exports of India to analyse the effects of various policy actions. The inverse supply function is estimated to check the influence of other variables on export prices of manufacturing products e.g., the export subsidy index has been used in the equation. The results show that subsidies have no impact on export prices, while the real effective exchange rate has a significant positive impact on the export quantity, as well as world economic activity and prices. Manufacturing exports have a larger share in trade balance which depreciation of currency affects positively.

According to Hamori and Matsubayashi (2009), instability in exports results in limited export-led growth in the LDCs. Cointegration analysis is used to test long-run relationship between exports, relative prices and world trade for 15 countries. Different panel tests are employed to test for panel cointegration for three different sample periods. Results show income and relative prices play an important role in governing export volume in the LDCs.

The long-run relationship between aggregate export demand and its determinants in case of Jordan is examined by Jamal (2008). Johansen-Juselius and Saikkonen-Lutkepohl multivariate cointegration procedure is used for the time series data. Results reveal that there exists long-run relationship between exports and its determinants. The significant and large coefficient of domestic GDP confirms the "growth led export" hypothesis; world income also has an important role in determination of exports. It supports trade liberalisation and export promotion strategies.

Havrila and Gunawardana (2006), analyse the textile export supply of Australia. The natural endowment of Australia is favourable for the production of basic inputs for textile industry (wool and cotton) but unable to take advantage because of lack of collaboration between producers and processors. The effective rate of assistance and real exports are non-stationary even in first difference. So the model is estimated by UECM. Results show that in the long-run export supply is more elastic with respect to relative prices and productive capacity but less responsive to effective rate of protection.

Malik (2000) analyses Pakistan's textile sector and points out the structural weaknesses of the industry, which is focusing on the production and export of low value products (yarn) at the cost of value added products (fabrics and readymade garments) whose share is increasing in the international market. The study confirms the small country hypothesis of low income elasticity and infinite price elasticity.

A large number of studies have been conducted for Asian countries specifically the NIE's to find out the long-run demand and supply side determinants of exports. The evidence suggests that relative price and world demand have significant role in determination of export demand. Supply prices and domestic production capacity have significant impact on exports supply across the countries. Both demand and supply side factors have equal importance for most of the countries [Roy (1991), Arize (1999)]. On the other hand, some studies have also supported that demand side factors have relatively greater importance than supply side factors in determining exports performance [Muscatelli, *et al.* (1992), Roy (2002), Roy (2007)]. No study has provided comprehensive methodology and detailed analysis of any specific sector. The purpose of this study is to fill these gaps and to provide in-depth analysis of this most important rxport sector of Pakistan.

4. MODEL SPECIFICATION, METHODOLOGY AND DATA SOURCES

In the present study, domestically produced goods and imported foreign goods are assumed to be imperfect substitutes of each other. Under this assumption, the export demand and export supply functions are specified as follows:

4.1. Demand Side Equation

Under the imperfect substitute model, exports demand is assumed to depend on relative prices and income levels of the trading partners a la Lundborg (1981), Goldstein and Khan (1978) and Abbott and Vita (2002). The logarithmic functional form of textile and clothing exports demand is specified as:

$$Ln\ X^d_t = \alpha_0 + \alpha_1\, lnREERi + \alpha_2\, lnWY_t + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Where X^d in Equation (1) represents demand for textile and clothing exports of Pakistan. *WY* is defined as *GDP* of the trading partner and represents the foreign demand for exports. *REER* is the export weighted Real Effective Exchange Rate and is used to highlight the competitive position of each country [Hassan and Khan (1994), Malik (2000), Atique and Ahmed (2003) and Ahmed (2000), Roy (2009)]. The α_1, α_2 are the elasticities of textile and clothing export demand with respect to REER and world demand respectively. α_1 is expected to be negative and α_2 as positive.

The devaluation of domestic currency *vis-à-vis* foreign currency will make the textile and clothing exports cheaper in the world market. It will help to increase the demand for textile and clothing exports of Pakistan. Therefore, devaluation/depreciation will be expected to have positive effect on the textile and clothing exports. *REER* is calculated on the lines of Hinkle and Nsengiyumva (1999b),[7] procedure of calculation given in Appendix-2. In addition to price competitiveness, the economic condition of trading partners measured by its GDP is also an important determinant of textile and clothing exports.

4.2. Supply Side Equation

It is evident from literature that in addition to the demand side factors, the supply side factors also play an important role in the determination of exports. The textile and clothing export supply equation in logarithmic form is specified as following Goldstein and Khan (1978), Virmani (1991) and Hassan and Khan (1994).

$$Ln\ X^S_t = \beta_0 + \beta_1\, ln\ RP_t + \beta_2\, ln\ W_t + \beta_3\, ln\ Y_t + \beta_4 D + V_t \quad \ldots \quad \ldots \quad (2)$$

Where X^s in Equation (2) represents textile and clothing exports supply, RP is the relative price of textile exports (UVI_{pak}/CPI_{pak} unit value index of exports of Pakistan divided by consumer price index).[8] *W* is the domestic real wage in the textile sector. It is used as a proxy for the cost of production in the textile sector [Muscatelli, *et al.* (1992), Amazonas and Barros (1993), Atique and Ahmed

[7] Ahmad (2000) and Atique and Ahmad (2003) also calculated REER in the similar way.
[8] Atique and Ahmed (2003), See Appendix-3 for more details.

(2003)]. *Y* denotes Pakistan's GDP; it is used as proxy for domestic production capacity of the economy and *D* represents the dummy variable. The β_1 is expected to be positive in the supply equation of the textile and clothing exports. The increase in relative prices makes exports more profitable for suppliers. The β_2 is expected to be negative and β_3 is expected to be positive. *D* is the dummy variable that captures the effect of trade liberalisation from 2005.[9] It was decided in the Uruguay Round to remove the restrictions under ATC in four phases (1st Jan. 1995, 1st Jan 1998, 1st Jan 2002 and 1st Jan 2005). It became effective in 2005, therefore the change in supply of exports is assumed to be restructured after that year. It was expected that larger market access will provide incentive for domestic producers to increase the level of production.

4.3. Empirical Methodology and Estimation Technique

In some studies, the normalisation procedure for estimating simultaneous equations has been used, however, the normalisation procedure is different in different studies [Reidel (1988), Muscatelli, *et al.* (1992), Funk and Holly (1992), Roy (2002, 2007), Zada (2012)]. Therefore, Joshi and Little (1994) have avoided the normalisation procedure; they consider exports' quantity as a dependent variable in estimation of both supply and demand equations. According to Muscatelli, *et al.* (1992), normalisation problem can be solved by using system equation methods i.e., Three Stage Least Square (3SLS), Full Information Maximum Likelihood (FIML) and Generalised Method of Moment (GMM).[10] In the present study, the demand and supply for textiles and clothing will be estimated simultaneously, assuming textile and clothing exports' demand and supply equal to total exports, that is:

$$X^d = X^S = X$$

The instrumental variable technique of Generalised Method of Moment (GMM) is employed here for the simultaneous equations. It gives better estimates for parameters in the presence of hetroscadesticity. The variables that are uncorrelated with error term and are related with independent variables can be used as instrument. One major advantage of the GMM is that it takes into account the endogeneity problem present in the model and provides consistent estimates.

4.4. Data Description and Sample Size

Annual data has been used for the period 1972–2010 for Pakistan's eight trading partners. Selected countries for the sample are United States, United

[9]Dummy is introduced in supply side equation instead of demand side equation because only USA and EU impose restrictions and manufacturers were producing under the pressure of trade restrictions.

[10]According to Muscateli (1992), normalisation problem can be resolved by incorporating endogenity and serial correlation.

Kingdom, Canada, Italy, France, Japan, Spain and United Arab Emirates. The country selection criteria is more than 1 percent share in Pakistan's exports. The data for GDP has been taken from the World Development Indicators (WDI). The data for export prices, CPI and exchange rate has been taken from International Financial Statistics (IFS). The data for textile wage rate has been taken from the International Labour Organisation (ILO). The data for textile and clothing exports have been taken from United Nations Commodity Trade Statistics Database (UN COMTRADE). The data from the UN COMTRADE is extracted according to SITC Rev. 1.

5. EMPIRICAL RESULTS

GMM estimates using lag explanatory variables as instruments for the demand of textile and clothing exports are given in Table 8. The results for Gross Domestic Product show that growth in the trading partners' income has the expected positive and significant impact on Pakistan's exports' demand which is elastic with respect to the trading partners' GDP in all cases except for Japan, UK, and USA. The lowest value of income elasticity is for UK i.e. 0.84 while the highest is for Spain i.e. 1.91. Therefore, the result indicates that improvement in world economic conditions will help to boost textile and

Table 8

GMM Estimates for the Demand Equation

$Ln\ X^d_t = \alpha_0 + \alpha_1\ lnREER_t + \alpha_2\ lnWY_t + \varepsilon$

Trading Partners	α_0	α_1	α_2	R^2
USA	–4.67	1.11	0.93	0.95
	(3.05)*	(2.48)**	(3.39)*	
UK	–3.55	1.18	0.84	0.86
	(6.83)*	(2.49)**	(6.44)**	
Canada	–4.35	0.96	1.09	0.93
	(6.50)*	(6.63)*	(9.58)*	
Italy	–2.73	0.88	1.23	0.93
	(1.53)	(2.27)**	(9.48)*	
France	–4.13	0.86	1.08	0.94
	(3.87)*	(3.79)*	(7.15)*	
Japan	–2.63	0.71	0.93	0.96
	(6.83)*	(3.83)*	(9.44)*	
Spain	–5.24	1.37	1.91	0.96
	(1.01)	(2.78)*	(2.51)**	

Note: The t-ratios are given in parenthesis, (*), (**) and (***) represents 1 percent, 5 percent and 10 percent significance respectively.

X is Textile and Clothing Exports, *REER* represents Real Effective Exchange Rate and *WY* is the Trading Partners Income.

clothing exports of Pakistan. Goldstein and Khan (1978) find positive and significant income elasticity of exports demand for the eight trading partners; it lies between 0.39 for Germany and 1.40 for France. Similarly, Virmani (1991) has reported more elastic and significantly positive income elasticity of manufacturing exports demand for India. Muscatelli, *et al.* (1992) have also found world income to be an important determinant of exports demand for Hong Kong. Rijesh (2007) shows significant and positive relationship between world demand and India's machine tools exports demand; here the reported coefficient is less than unity. Income elasticity estimates obtained by Zada (2012) are very close to our estimates, the coefficient ranges from 0.73–0.90.

The Real Effective Exchange Rate depicts variation in real exchange rate. Textile and clothing exports' demand is quite responsive to REER. The estimated coefficients for Spain, UK and US are greater than unity, while the rest are less than unity. Coefficients across the countries appear to have their expected positive signs ranging from 0.71 to 1.37. The impact of REER is larger for Spain i.e. 1.37 percent followed by UK 1.18 percent; the lowest is 0.71 percent for Japan. The REER elasticity of textile and clothing exports' demand is 1.11 percent for USA, 0.96 percent for Canada and 0.88 percent for Italy and 0.86 percent for France. The positive sign of devaluation coefficient reflects improvement in the competitiveness of our textile and clothing exports. The positive and significant coefficient indicates that real devaluation of Pakistan rupee against all trading partner's currencies leads to increase in textile and clothing demand from Pakistan. The results indicate that the real devaluation of rupee is very helpful in increasing the textile and clothing exports. The significant and large coefficient of REER is also reported by Goldar (1989) for India. The study finds devaluation an effective measure to boost engineering exports demand from India. Virmani (1991) also finds manufacturing exports demand for India relatively more responsive to devaluation. Ahmad (2000) has observed the exports' performance of Bangladesh and has reported that real devaluation of domestic currency leads to increase in the competitiveness of exports. It can be noted that their estimates are very close to our estimates i.e. 0.96. Contrary to the findings of the present study, Atique and Ahmad (2003) find significant and small elasticity of devaluation for Pakistan's exports demand, the size of the coefficient is 0.39. In a similar way, Malik (2000) finds devaluation insignificant and less effective to increase textile exports demand from Pakistan. The textile and clothing exports' demand from Pakistan is elastic to change in prices; therefore, price effects have strong and important role in boosting the exports' demand.

The GMM estimates for the supply side equation are given in Table 9. Relative prices have the expected positive and significant influence on the textile and clothing exports to all trading partners, except Spain where they are

Table 9

GMM Estimates for the Supply Equation

$lnX^S_t = \beta_0 + \beta_1 ln\, RPT_t + \beta_2 ln\, W_t + \beta_3 ln\, Y_t + \beta_4 D + \varepsilon_t$

Trading Partners	β_0	β_1	β_2	β_3	β_4	R^2
USA	–2.41	4.41	–0.60	1.07	–0.21	0.69
	(1.24)	(2.06)**	(1.82)***	(2.59)**	(0.82)	
UK	–2.49	5.31	–0.06	1.05	–0.15	0.79
	(–1.46)	(1.82) ***	(–0.15)	(2.79) *	(–0.35)	
Canada	–2.52	4.23	–0.86	0.96	-0.58	0.78
	(–2.46) **	(2.12) **	(–1.77) ***	(4.27) *	(–1.98) **	
Italy	–2.48	7.43	–0.35	0.98	–0.10	0.91
	(1.16)	(2.74)**	(0.63)	(2.13)**	(0.25)	
France	–1.52	4.01	-0.03	0.72	0.02	0.78
	(1.81)***	(5.69)*	(0.14)	(4.02)*	(0.15)	
Japan	–1.64	5.53	–0.46	0.91	–1.16	0.37
	(0.69)	(4.66)*	(0.62)	(1.80)***	(2.80)**	
Spain	–3.82	2.19	–0.48	1.01	0.29	0.77
	(–2.01) ***	(1.18)	(–1.90) ***	(2.38) **	(0.50)	

Note: t-ratios are given in parenthesis, (*), (**) and (***) represents 1 percent, 5 percent and 10 percent significance respectively.

X is Textile and Clothing Exports, *RPT* shows Relative Prices, *W* represents Real Wages in Textile Sector, *Y* is GDP of Pakistan and *D* shows Dummy for Restrictions.

more responsive to change in real devaluation on demand side than the relative prices on the supply side. The result shows that the textile and clothing exports of Pakistan are more elastic to change in relative prices across countries. The coefficient of the relative price variable is found to be greater than unity.

The highest relative price elasticity is 7.43 for Italy and the lowest is 2.19 for Spain. This shows that export prices have substantial role in determining the exports supply as compared to the domestic prices of the exportable goods. Therefore, increase in export prices[11] compared to domestic prices will encourage manufacturers to increase textile and clothing exports of Pakistan. Zada (2012) also found similar results. Goldstein and Khan (1987) have examined exports supply elasticities with respect to relative price for seven European countries. Havrila and Gunawardana (2006) have estimated the relative price elasticity for textile exports supply of Australia and report long run elasticity of 1.83.

[11]Exports price is used as a proxy for textile and clothing exports, see relative prices in explanation of variables for more details.

The real wages of the textile sector[12] seem to have negative impact on supply of textiles and clothing exports to five out of seven trading partners; however, coefficients for US, Canada and Spain are found significant at 10 percent and Atique and Ahmad (2003) have come up with the same results. The size of the estimated coefficient is also small and this result implies that though the supply of Pakistan's textile and clothing exports increases with decrease in real wages but it is not very responsive. It shows that decrease in real wages in the textile sector without corresponding increase in productive capacity cannot improve the performance of the same sector. It means cuts in real wage are not effective in boosting textile and clothing exports.

Few estimates of exports supply elasticity with respect to real wages are available in literature to compare the results of this study with. Muscatelli, *et al.* (1992) have used the index of nominal wage of manufacturing sector and estimated relatively large response of –1.48 for Hong Kong. Atique and Ahmad (2003) have used wage rate per worker as a proxy for the cost of production. They have obtained significant and negative exports supply (for Pakistan) response with respect to wages of –0.70. This is very close to our results. Amazonas and Barros (1993) report negative and significant response of Brazilian manufacturing exports to change in real wage of –0.83.

The GDP figures of Pakistan are employed to explain the production capacity of the domestic economy. This variable has the expected positive and significant impact on exports to all trading partners. The range of elasticity is 0.72 (lowest) for France and 1.07 (highest) for USA. The results show that GDP is an important determinant of this sector's exports supply for Pakistan. Growth in domestic economy will encourage manufacturers to produce and export textiles and clothing products. Virmani (1991) reports significant and positive relationship between GDP (manufacturing) and export supply of manufacturing product for India, where the magnitude of coefficient is 0.75. In the same way, Atique and Ahmad (2003) have computed income elasticity of exports supply for Pakistan and have found significant and positive coefficient of 3.67. Zada (2012) finds significant and positive income elasticity of exports supply for 11 trading partners, where the range of the coefficient is from 0.02 to 0.36.

The estimated coefficient of the dummy variable has an unexpected negative sign for six out of eight trading partners. All coefficients are insignificant except for Canada and Japan and these estimates are small except for Japan. The response of Pakistan's textile and clothing exports supply to the liberalisation agreement (ATC) is not according to expectation. The trade in textile and clothing sector was supposed to operate freely after 2005, but results reveal a different story and indicate that trade liberalisation is unable to boost the exports supply and may even worsen the performance. There are other

[12]It is used to represent cost of textile and clothing production. See wage rate in explanation of variables.

hurdles which lead to low textile and clothing exports performance; (i) After removal of quantitative restriction, Pakistan has to face strict competition from countries like China, South Korea and India in the form of quality and price; (ii) supply side deficiencies i.e. technological backwardness and lack of skilled labour force are responsible for less productive capacity. From policy point of view appropriate steps were not taken to benefit from the abolition of the quota restrictions regime.

The results for the textile and clothing exports demand and supply equations are obtained by applying GMM and Empirical Bayesian techniques. The results support that all techniques lead to almost the same findings. The real effective exchange rate and GDP of trading partners have a positive effect on the demand of Pakistan's textiles and clothing exports. In respect of the demand for textile and clothing exports, the REER and GDP of the trading partners have long-run equilibrium relationship among them. On the supply side, the relative prices and domestic production capacity have the positive and wage rate the negative impact on textile and clothing exports' supply. The results suggest that the Empirical Bayesian is a better technique to estimate the demand and supply of textiles and clothing exports of Pakistan. These results are in conformity with most of the earlier findings for other developing countries in general and for Pakistan in particular, as mentioned in the above discussion.

6. CONCLUSION AND POLICY IMPLICATIONS

In the present study, an attempt has been made to find the demand and supply determinants for Pakistan's textile and clothing exports through detailed analysis during the period 1972–2010. It is clear from the analysis that textile and clothing exports have increased with the change in trade regime such as MFA to ATC but comparatively at a slow rate. The share of manufacturing products has increased in the total textile and clothing exports, which is obviously a positive sign. The demand side determinants are the REER and GDP of trading partners, whereas, the supply side defines relative prices, real wages and GDP of Pakistan. A dummy variable has been introduced in the supply side to incorporate the supply response of change in trade restrictions. The simultaneous equation model has been formed for the time series data 1972–2010. The demand and supply equations are estimated by using the GMM technique. This study also finds positive and significantly high-income elasticity in textile and clothing exports demand. It shows that world demand is a major source of exports demand from Pakistan. The significant and small coefficient of REER indicates that devaluation of Pakistan currency with respect to the trading partner's currency is an effective measure to increase long-run textile and clothing exports growth.

On the supply side, the relative prices have significant and large coefficients. An important finding of the study is that the rise in export prices

more than the domestic prices provides incentives to domestic producers. The significant and negative magnitude of real wages represents that increase in cost leads to decrease in exports supply. The significant and large income elasticity on the supply side indicates that the domestic capacity of the economy plays an important role in the supply of textile and clothing exports. The result reveals that both demand and supply side factors play important role in the determination of textile and clothing exports.

Textile and clothing exports from Pakistan remained stagnant during the first five years of the Agreement of Textile and Clothing (ATC) 1994–2005, after that there was a positive turn in exports growth. The change in composition of textile and clothing exports from primary to manufactured products is supported by several demand and supply side factors. Relative prices and domestic capacity plays a significant role in explaining textile and clothing behaviour on the supply side. On the other hand, world demand and real devaluation are important determinants on the demand side. Textile and clothing exports growth was not in line with world demand because of many restrictions from developed countries.

The results of descriptive statistics given in the overview section suggest that in addition to diversification of textile and clothing exports market, Pakistan needs to improve its competitiveness in the international market which has grown more competitive since the trade liberalisation regime of WTO. To survive in this competitive environment producers need to adopt new techniques for the production of high value added products i.e. readymade garments and cloths. The result also supports that devaluation is helpful in the improvement of long-run textile and clothing exports. Devaluation can be more effective when combined with exports of high quality products and diversification of exports markets.

On the supply side, significant and large magnitude of relative prices has important implications. Price incentives encourage domestic producers to increase exports supply. The composition of investment in textiles and clothing indicates that the spinning sector holds major share in total investment and as a result, the share of cotton yarn is equally high in production and exports. There is need to focus on converting good quality yarn in the value added categories i.e. cloth and readymade garments. The major share of fabrics is produced with cotton in Pakistan but demand for man-made fibre is increasing at the international level. Textiles and clothing producers should increase synthetic fibre content in textiles and clothing production. The newly industrialised countries (China, Hong Kong and South Korea) achieved high growth targets in international market through relying more on domestic supply side factors. The reduction in wage rate cannot entirely improve the production of textile and clothing; producers should be provided incentives such as easy capital availability.

It is clear from the analysis that the textile and clothing exports of Pakistan have slightly increased over the study period but remain concentrated in a few markets. The implication that comes out of the findings is that GDP has great effect on the demand side and relative prices and domestic production capacity on the supply side. Therefore, authorities should take account of these factors while making decisions in this sector.

This study examines the determinants of overall textile and clothing exports. Components of textile and clothing (raw cotton, cotton yarn, cotton cloth, readymade garments, synthetic textile etc) exports are not considered because of non-availability of data on each variable. For future research, this study can be extended by taking account of all components of textile and clothing.

APPENDIX-1

APPENDIX 1A

Production and Exports of Cloth

Qty. in 'x1000' Sq. Mtrs

Year	Mill Sector	Non-mill Sector	Total Production	Mill Sec. (% of Prod.)	Non-Mill Sec. (% of prod.)	EXPORTS	
						Quantity	% of Prod.
1972-73	588.61	649.5	1238.11	47.54	52.46	517.98	41.84
1973-74	592.17	1236.55	1828.72	32.38	67.62	353.02	19.3
1974-75	555.86	1271.22	1827.08	30.42	69.58	440.81	24.13
1975-76	520.44	982.92	1503.36	34.62	65.38	463.84	30.85
1976-77	408.29	1037.01	1445.3	28.25	71.75	416.84	28.84
1977-78	391.35	1181.72	1573.07	24.88	75.12	453.47	28.83
1978-79	339.35	1147.75	1487.1	22.82	77.18	531.53	35.74
1979-80	342.33	1377.69	1720.02	19.90	80.10	545.77	31.73
1980-81	307.89	1526.11	1834	16.79	83.21	500.9	27.31
1981-82	325.02	1875.42	2200.44	14.77	85.23	584.35	26.56
1982-83	335.54	1713.23	2048.77	16.38	83.62	605.33	29.55
1983-84	296.6	1869.38	2165.98	13.69	86.31	664.38	30.67
1984-85	271.83	1728.17	2000	13.59	86.41	687.62	34.38
1985-86	253.48	1731.92	1985.4	12.77	87.23	727.35	36.63
1986-87	238.17	1771.68	2009.85	11.85	88.15	693.42	34.5
1987-88	281.62	1949.2	2230.82	12.62	87.38	848.61	38.04
1988-89	269.86	1980.14	2250	11.99	88.01	845.33	37.57
1989-90	294.84	2439.93	2734.77	10.78	89.22	1017.87	37.22
1990-91	292.91	2561.09	2854	10.26	89.74	1056.53	37.02
1991-92	307.93	2931.06	3238.99	9.51	90.49	1196.12	36.93
1992-93	325.4	3034.6	3360	9.68	90.32	1127.58	33.56
1993-94	314.91	3063.09	3378	9.32	90.68	1046.79	30.99
1994-95	321.84	2778.91	3100.75	10.38	89.62	1160.66	37.43
1995-96	326.98	3379.02	3706	8.82	91.18	1323.09	35.7
1996-97	333.5	3447.7	3781.2	8.82	91.18	1257.43	33.25
1997-98	340.28	3573.42	3913.7	8.69	91.31	1271.27	32.48
1998-99	384.56	4002.23	4386.79	8.77	91.23	1355.17	30.89
1999-00	437.19	4549.97	4987.16	8.77	91.23	1574.88	31.58
2000-01	490.16	5101.24	5591.4	8.77	91.23	1736	31.05
2001-02	568.43	5084.66	5653.09	10.06	89.94	1957.35	34.62
2002-03	582.14	5068.38	5650.52	10.30	89.70	2005.38	35.49
2003-04	683.39	5051.9	6833.12	10.00	73.93	2412.87	35.31
2004-05	924.67	5556	6480.67	14.27	85.73	2751.56	42.46
2005-06	915.26	7609	8524.26	10.74	89.26	2633.98	30.9
2006-07	1012.92	7682	8694.92	11.65	88.35	2211.84	25.44
2007-08	1016.39	7889.05	9005.44	11.29	87.60	2035.14	22.6
2008-09	1019.68	7995.57	9015.26	11.31	88.69	1898.54	21.06
2009-10	1009.59	7940.18	8949.77	11.28	88.72	1787.66	19.97

Source: APTMA.

APPENDIX 1B

Category Wise Share in Total Cloth Production

Qty. in '000' Sq. Mtrs

Period	Blended	Grey	Bleached	Dyed & Printed	Total	Blended, (%Share in Prod.)	Grey (%Share in Prod.)	Bleached (% Share in Prod.)	Dyed & Printed (% Share in Prod.)
1971-72	0	403,961	105,627	118,601	628,189	0	64.31	16.81	18.88
1972-73	0	383,318	115,110	90,178	588,606	0	65.12	19.56	15.32
1973-74	0	353,209	134,635	104,328	592,172	0	59.65	22.74	17.62
1974-75	0	342,992	107,806	105,057	555,855	0	61.71	19.39	18.90
1975-76	0	360,948	76,069	83,421	520,438	0	69.35	14.62	16.03
1976-77	3,428	279,961	57,004	67,894	408,287	0.84	68.57	13.96	16.63
1977-78	4,469	252,278	60,476	74,124	391,347	1.14	64.46	15.45	18.94
1978-79	10,229	246,682	38,719	43,722	339,352	3.01	72.69	11.41	12.88
1979-80	18,149	231,054	44,128	49,004	342,335	5.30	67.49	12.89	14.31
1980-81	28,279	191,263	39,527	48,813	307,882	9.19	62.12	12.84	15.85
1981-82	40,912	197,433	33,485	53,191	325,021	12.59	60.74	10.30	16.37
1982-83	38,397	175,801	53,622	67,717	335,537	11.44	52.39	15.98	20.18
1983-84	36,632	152,465	47,766	59,733	296,596	12.35	51.40	16.10	20.14
1984-85	28,855	148,672	39,424	54,876	271,827	10.62	54.69	14.50	20.19
1985-86	31,870	142,883	29,576	49,151	253,480	12.57	56.37	11.67	19.39
1986-87	54,028	115,967	23,384	44,789	238,168	22.68	48.69	9.82	18.81
1987-88	61,136	142,444	20,891	57,150	281,621	21.71	50.58	7.42	20.29
1988-89	49,185	147,666	19,061	53,950	269,862	18.23	54.72	7.06	19.99
1989-90	47,223	174,565	19,442	53,609	294,839	16.02	59.21	6.59	18.18
1990-91	57,534	160,935	16,613	57,829	292,911	19.64	54.94	5.67	19.74
1991-92	66,256	158,790	18,345	64,542	307,933	21.52	51.57	5.96	20.96
1992-93	67,344	163,213	20,363	74,476	325,396	20.70	50.16	6.26	22.89
1993-94	59,835	170,032	15,482	69,565	314,914	19.00	53.99	4.92	22.09
1994-95	51,907	180,810	12,008	77,116	321,841	16.13	56.18	3.73	23.96
1995-96	61,293	191,492	13,110	61,086	326,981	18.75	58.56	4.01	18.68
1996-97	57,198	194,420	11,935	69,942	333,495	17.15	58.30	3.58	20.97
1997-98	56,478	206,254	13,032	64,516	340,280	16.60	60.61	3.83	18.96
1998-99	64,799	195,687	25,722	98,353	384,561	16.85	50.89	6.69	25.58
1999-00	60,607	263,593	11,064	101,926	437,190	13.86	60.29	2.53	23.31
2000-01	67,474	277,931	19,939	124,820	490,164	13.77	56.70	4.07	25.46
2001-02	77,039	317,247	18,281	155,869	568,436	13.55	55.81	3.22	27.42
2002-03	92,612	295,791	32,227	161,515	582,145	15.91	50.81	5.54	27.74
2003-04	101,687	332,361	43,841	205,503	683,392	14.88	48.63	6.42	30.07
2004-05	51,453	498,095	82,381	292,743	924,672	5.56	53.87	8.91	31.66
2005-06	52,273	504,899	78,354	279,730	915,256	5.71	55.16	8.56	30.56
2006-07	61,100	582,819	71,681	297,318	1,012,918	6.03	57.54	7.08	29.35
2007-08	54,737	561,695	73,311	326,647	1,016,390	5.39	55.26	7.21	32.14
2008-09	56,093	553,551	78,201	331,838	1,019,683	5.50	54.29	7.67	32.54
2009-10	59,441	566,020	86,127	297,999	1,009,587	5.89	56.06	8.53	29.52

Source: APTMA.

APPENDIX 1C

Consumption of Cotton and MMF in Textile Production

(Fig. in '000' Kgs)

	Raw Material			Growth %		% age of Total	
Period	Cotton	Fibre	Total	Cotton	Fibre	Cotton	Fibre
1972-73	463118	N.A	463118	14	N/A	100	N/A
1973-74	475348	N.A	475348	3	N/A	100	N/A
1974-75	420608	N.A	420608	-12	N/A	100	N/A
1975-76	419735	N.A	419735	0	N/A	100	N/A
1976-77	343194	N.A	343194	-18	N/A	100	N/A
1977-78	355986	N.A	355986	4	N/A	100	N/A
1978-79	387581	N.A	387581	9	N/A	100	N/A
1979-80	428554	NA	428554	11	N/A	100	N/A
1980-81	407523	37088	444611	-5	N/A	92	8
1981-82	459,459	41,550	501,009	13	12	92	8
1982-83	478,716	37,983	516,699	4	-9	93	7
1983-84	457,629	48,829	506,458	-4	29	90	10
1984-85	459,394	52,237	511,631	0	7	90	10
1985-86	500,065	58,534	558,599	9	12	90	10
1986-87	634,886	62,833	697,719	27	7	90	10
1987-88	712,456	67,282	779,738	12	7	91	9
1988-89	809,978	69,256	879,234	14	3	92	8
1989-90	998,447	71,904	1,070,351	23	4	93	7
1990-91	1,128,978	85,560	1,214,538	13	19	93	7
1991-92	1,257,399	105,775	1,363,174	11	24	92	8
1992-93	1,318,892	125,525	1,444,417	5	19	91	9
1993-94	1,511,610	182,077	1,693,687	15	45	89	11
1994-95	1,412,732	192,152	1,604,884	-7	6	88	12
1995-96	1,509,955	192,691	1,702,646	7	0	89	11
1996-97	1,444,368	236,692	1,681,060	-4	23	86	14
1997-98	1,471,169	318,923	1,790,092	2	35	82	18
1998-99	1,441,923	407,686	1,849,609	-2	28	78	22
1999-00	1,566,348	404,008	1,970,356	9	-1	79	21
2000-01	1,673,280	405,038	2,078,318	7	0	81	19
2001-02	1,755,669	409,557	2,165,226	5	1	81	19
2002-03	1,943,197	449,424	2,392,621	11	10	81	19
2003-04	1,938,678	468,984	2,407,662	0	4	81	19
2004-05	2,099,380	488,804	2,588,184	8	4	81	19
2005-06	2,407,560	525,000	2,932,560	15	7	82	18
2006-07	2,563,510	580,000	3,143,510	6	10	82	18
2007-08	2,521,170	638,000	3,159,170	-2	10	80	20
2008-09	2,519,184	676,464	3,195,648	-0.1	6	79	21
2009-10	2,401,840	970,524	3,372,364	-4.7	43	71	29

Source: APTMA.

APPENDIX-2

Calculation of Real Effective Exchange Rate

$$REER_{it} = \frac{\alpha_i E_{it} P_{it}^*}{P_j}$$

Here, *REER* shows the bilateral real exchange rate. *Eit* is the nominal exchange rate between country *i* and Pakistan currency which has been taken

from various issues of *Economic Survey*. α_i stands for trade weights and represents the share of trading partner exports in total textile and clothing exports of Pakistan. P_{it}^* is the Whole Sale Price Index of partner *I*; it is used here to represent the price of tradable commodities. P_j is Consumer Price Index of home country (Pakistan), it represents the price of non-tradable goods.

APPENDIX-3

Fig. 3A. Share of Textile Exports of Pakistan in Different Periods

(During the specified period, share of textile exports in total exports is more than 50 percent. Any change in textile exports changes the total exports. Because of data limitations, the study uses relative prices of exports as a proxy for relative prices of textile exports.)

REFERENCES

Abbott, A. J. and G. V. Vita (2002) Long-run Price and Income Elasticities of Demand for Hong Kong Exports: A Structural Cointegrating VAR Approach. *Journal of Applied Economics* 34:8, 1025–1032.

Ahmed, N. (2000) Export Response to Trade Liberalisation in Bangladesh: A Cointegration Analysis. *Journal of Applied Economics* 32:8, 1077–1084.

Akhtar, S. and F. Malik (2000) Pakistan's Trade Performance *vis-à-vis* Its Major Trading Partners. *The Pakistan Development Review* 39:1, 37–50.

All Pakistan Textile Mills Association (APTMA), (Various Issues).

Amazonas, A. and A. Barros (1993) Manufactured Exports from Brazil: Determinants and Consequences. *Revista Brasileira de Economia* 50.

Arize, A. C. (1999) The Demand for LDC Exports: Estimates from Singapore. *The International Trade Journal* 13:4, 345–370.

Asteriou, D. and S. G. Hall (2007) *Applied Econometrics: A Modern Approach*. (Revised Edition) Palgrave Macmillan.

Atique, Z. and M. H. Ahmed (2003) The Supply and Demand for Exports of Pakistan: The Polynomial Distributed Lag Model (PDL) Approach. *The Pakistan Development Review* 42:4, 961–972.

Aurangzeb, A., T. Stengos, and A. U. Mohammad (2005) Short-Run and Long-Run Effects of Exchange Rate Volatility on the Volume of Exports: A Case Study for Pakistan. *International Journal of Business and Economics* 4:3, 209–222.

Bhatti, R. H. (1997) On Single and Multi-Market Unbiasedness of Forward Exchange Rates: Some Evidence from Four Asian Countries. *Journal of Economic Integration* 12:3, 402–417.

Carrington, W. J. and A. Zaman (1994) Inter Industry Variation in the Costs of Job Displacement. *Journal of Labour Economics* 12:2, 243–275.

Casella, G. (1985) An Introduction to Empirical Bayes Data Analysis. *The American Statistician* 39:2, 83–87.

Casella, G. (1992) Illustrating Empirical Bayes Methods. *Chemometrics and Intelligent Laboratory System* 16, 107–125.

Chaudhuri, S. Z. (2000) *RMG: Flourish or Perish beyond 2004.* Dhaka: Bangladesh Institute of Development Studies.

United Nation Commodity Trade Statistics (UNCOMTRADE), Retrieved on 05-06-2012, http://comtrade.un.org/db/dqBasicQuery.aspx .

Funke, M. and S. Holly (1992) The Determinants of West German Exports of Manufactures: An Integrated Demand and Supply Approach. *Review of World Economics* 128:3, 498–512.

Goldar, B. (1989) Determinants of India's Exports Performance in Engineering Products, 1960-79. *The Developing Economies* 27:1.

Goldstein, M. and M. S. Khan (1978) The Supply and Demand for Exports: A Simultaneous Approach. *The Review of Economic and Statistics* 60:2, 275–286.

Hamori, S. and Y. Matsubayashi (2009) Empirical Analysis of Export Demand Behaviour of LDCs: Panel Cointegration Approach. *Economics Bulletin* 29:3, 1990–1999.

Hasan, M. A. and A. H. Khan (1994) Impact of Devaluation on Pakistan's External Trade: An Econometric Approach. *The Pakistan Development Review* 33:4, 1205–1215.

Havrila, I. and P. Gunawardana (2006) Determinants of Export Supply of the Australian Textiles Industry. *Economic Analysis and Policy* 36:1&2, 45–59.

Houthakker, S. H. and P. S. Magee (1969) Income and Price Elasticities in World Trade. *The Review of Economics and Statistics* 51:2, 111–125.

IMF. *International Financial Statistics*, Various Issues.

In, F. and P. Sgro (1998) Exports Growth and Its Determinants: Some Evidence for South Korea and Singapore. *Applied Economics Letters* 5:4, 225–230.

International Labour Organisation, Retrieved from http://laborsta.ilo.org/STP/guest.

Jamal, H. (2008) Traditional Export Demand Relation: A Cointegration and Parameter Constancy Analysis. *International Journal of Applied Econometrics and Quantitative Studies* 5:2.

Joshi, V. and I. M. D. Little (1994) *India: Macroeconomics and Political Economy, 1964-1991*. Delhi: Oxford University Press.

Khan, Z. (2003) *Impact of Post-ATC Environment on Pakistan's Textile Trade*. UNDP.

Khan, M. S. and M. D. Knight (1988) Important Compression and Export Performance in Developing Countries. *The Review of Economics and Statistics* 70:2, 315–321.

Malik, A. (2000) Demand for Textile and Clothing Exports of Pakistan. Pakistan Institute of Development Economists, Islamabad. (Research Report No. 180).

Lewis, A. W. (1980) The Slowing Down of the Engine of Growth. *The American Economic Review* 70:4, 555–564.

Lundborg, P. (1981) The Elasticity of Supply and Demand for Swedish Exports in a Simultaneous Model. *The Scandinavian Journal of Economics* 83:3, 444–448.

Ministry of Textile Industry, Research, Development and Advisory Cell. *Textile and Clothing Trade (2007-08).*

Muscatelli, V. A., T. G. Srinivasan, and D. Vines (1992) Demand and Supply Factors in the Determination of NIE Exports: A Simultaneous Error-Correction Model for Hong Kong. *The Economic Journal* 102:415, 1467–1477.

Muscatelli, V. A, A. A. Stevenson, and C. Montagna (1995) Modelling Aggregate Manufactured Exports for Some Asian Newly Industrialised Economies. *The Review of Economics and Statistics* 77:1, 147–155.

Mustafa, K. and M. Nishat (2004) Volatility of Exchange Rate and Export Growth in Pakistan: The Structure and Interdependence in Regional Markets. *The Pakistan Development Review* 43:4, 813–828.

Narayan, S. and P. K. Narayan (2004) Determinants of Demand for Fiji's Exports: An Empirical Investigation. *The Developing Economies* 52:1, 95–112.

Pakistan, Ministry of Finance. *Economic Survey of Pakistan (2000-2012).*

Pakistan, Small and Medium Enterprise Development Authority (SMEDA). *Textile Vision 2005*.

Reidel, J. (1984) Trade as the Engine of Growth in Developing Countries, Revisited. *The Economic Journal* 94:373, 56–73.

Reidel, J. (1988) The Demand for LDC Exports of Manufactures: Estimates for Hong Kong. *The Economic Journal* 98:389, 138–148.

Rijesh, R. (2007) Trade liberalisation, Competitiveness and Exports Performance: A Study of Machine Tool Industry in India. Unpublished Master of philosophy Thesis Submitted to Jawaharlal Nehru University, New Dehli.

Roy, S. S. (2002) The Determinants of India's Exports: A Simultaneous Error-Correction Approach. Research and Information for the Non-Aligned and other Developing Countries (RIS-DP).

Roy, S. S. (2007) Demand and Supply Factors in the Determination of India's Disaggregated Manufactured Exports: A Simultaneous Error-Correction Approach. (Working Paper 383).

Roy, D. K. (1991) Determinants of Export Performance of Bangladesh. *The Bangladesh Development Studies* 19:4, 27–48.

Senhadji, A. S. and C. E. Montenegro (1999) Time Series Analysis of Exports Demand Equation: A Cross-Country Analysis. *IMF Staff Papers* 46:3, 259–273.

Virmani, A. (1991) Demand and Supply Factors in India's Trade. *Economic and Political Weekly* 26:6, 309–314.

Warr, P. G. and F. G. Wollmer (1997) Testing the Small-Country Assumption: Thailand's Rice Exports. *Journal of the Asia Pacific Economy* 2:2, 133–143.

World Bank, *World Development Indicators*. http://data.worldbank.org/indicator/all.

World Trade Organisation. http://www.wto.org/english/res_e/statis_e/looking4_e.htm#summary.

Zada, N. (2012) Determinants of Exports of Pakistan: A Country-wise Disaggregated Analysis. Unpublished Master of Economics, Thesis Submitted to International Islamic University, Islamabad.