Patterns of Trade and Its Future Prospects in Pakistan: A Time-Series Analysis

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Abstract

The objective of present study is to analyse the pattern of trade and to forecast its future trend in the case of Pakistan using time-series data for the period 1960-2010. The direction of foreign trade shows that exports are suffering from concentration to few markets provided by USA, Japan, UK, Germany, Hong Kong and Saudi Arabia. However, their shares in Pakistan's exports have changed over the time. The composition of exports have changed significantly since 1960s due to a sharp fall in the share of primary goods and the increase of manufactured goods. The analysis of major imports shows that imports are concentrated in three groups namely petroleum, machinery and transport, raw materials. The direction of imports has shown a sign of diversification in 1990s and 2000s as the total share of major trading partner fell to 35% in total imports. Forecasting results estimated by ARIMA modelling show that exports will rise to 20588 million dollars and imports 37497.45 million dollars by 2015.

I-Introduction

Exports are important for economic development especially for developing countries. It is an important source of foreign exchange earnings which can be used to finance imports. Imports play a significant role in domestic capital formation and are also used as input in the production of exportable commodities. Thus, trade is a major determinant of economic growth. Pattern of trade changes with the development process. Initially, a country usually exports primary commodities and imports consumer goods. With the passage of time, exports changes to manufactured goods and imports to machinery. Pakistan, one of the Asian developing countries observed the same pattern of trade for the period 1960-2010.

Pakistan is basically an agrarian economy. Its exports directly or indirectly depend upon agriculture sector. After independence (1948-1949), Pakistan major exports were made up of raw jute, raw cotton, raw wool, hides and tea. By 1951, the contribution of the primary commodities in total export earnings was 93%. However, at the end of 1950s, the share of primary commodities fell to 75% of export earnings due to shift of policies towards industrialization (Chaudhary & Ahmed, 2004). The main trading partners of Pakistan during early years were UK, USA, Germany, Belgium, Italy and Japan (Zaidi, 2005)

In 1970s, the average growth rate of exports was 13.5% and imports were 16.6%. The average growth rate of trade deficit was 20.5%. During this era, the increase in oil prices and unfavourable weather condition was the major factors for increasing trade deficit. In 1970-71, share of primary goods was 33% which increased to 42% in 1979-80. The share of manufactured commodities was 44% in 1970-1971 which decreased to 43% by 1979-80. Imports of consumer goods had increased from 37% in 1970-71 to 58% in 1979-80.

In 1980s the average growth rate of exports was 8.5% and imports were 4.5%. The average growth rate of trade deficit was 0.9%. During this decade the share of primary commodities decreased from 44% in 1980-81 to 20% in 1989-90. The share of manufactured goods increased from 45% to 59% in the same time. The share of consumer goods in imports had declined from 65% in the beginning of the 1980s to 60% by the end of 1989. Pakistan's share in total world exports increased marginally from 0.13% in 1980 to 0.15% in 1997 Pakistan's share in the total world imports declined from 0.25% in 1980 to 0.22% in 1997. During 1990s the average annual export growth was 5.6% and for imports it was 3.2%. The average growth of trade deficit was -0.6%. During 1990-91, the share of primary commodities was 19% of total exports which fell to 12% in 1999-2000. Similarly, share of manufactured goods increased from 57% in 1990-91 to 73% in 1999-2000. Share of industrial raw materials of consumer goods in imports have shown an increasing trend, rising from 60% in 1990-91 to 68% in 1999-2000. This shows that as development proceeds share of industrial raw material rises to boost the process of industrialization. (Economic survey of Pakistan, 2010)

In 2000s, the average growth in exports was 9.9% and imports were 13.7%. The average growth of trade deficit was around 60%. Exports amounted to $15.9 billion in 2009-10, that is greater than the last years export volume of $14.7 billion, showing a growth rate of 8% compared to the negative growth rate of 3% during the last year. On the other hand the import growth during 2009-2010 declined by 2.8% as compared to the last year's growth. Lower international prices, compressed domestic demand, exchange rate depreciation and improved production of cotton crops were the major reasons for the overall decline in import bill. Thus, overall picture of Pakistan's trade shows that nature of trade has changed from primary commodities to manufactured products but still most of these manufactured goods are primarily agricultural commodities particularly cotton.

The specific objective of present study is to analyse the pattern of trade and to forecast its future trend in the case of Pakistan. The time span to be covered in the study is 1960-2010.

The rest of the paper is divided into six sections. Section II provides a review of literature of previous studies; Section III provide structure of trade from 1960-2010; Section IV presents methodology; Section V analyses the results and their interpretation; and final Section VI concludes the study.

II- Literature Review

Trade is important for developed as well as developing countries. The composition and volume of global trade has undergone significant changes during last 20 years. The main determinants of world trade are technological innovations, rising income and trade liberalization. This section present the brief review of literature on exports and trade pattern.

Ghafoor and Hanif (2005) had analysed the pattern of trade in Pakistan for the period 1971-2003 and forecast the level of imports and exports by the year 2010. The authors had employed ARIMA modelling for forecasting purpose and a log linear model for estimating growth trend. The results indicated an increasing trend both for imports and exports during the last three decades i.e. 1970s, 80s and 90s. As far as forecasting results are concerned, the exports are expected to rise to Rs.418461 million with upper and lower limits of Rs.696056 and 140866 million. For imports the forecasting results showed that imports are expected to rise to Rs. 550089.0 million with upper and lower limits of Rs. 834915 million and Rs. 265263 million. In the light of these results, the authors concluded that it is better to diversify export pattern in terms of products and destination.

Chaudhary and Saleem (2004) had empirically estimated the growth pattern of Pakistan's exports, competitiveness of exports, revealed comparative advantage and commodity concentration between the time periods 1972-1998. The authors had used different indices and equations such as comparative advantages index, commodity concentration index, export instability index and complementarity index for estimation. The results revealed that the pattern of Pakistan's trade had slightly changed over time. The results further showed that the share of imports from Pakistan also increased. Finally, this study gives a better insight of the trade pattern of the Pakistan by employing additional estimation techniques; but it could be more beneficial for the future researchers if future prospects of Pakistan's trade would also have been incorporated in it.

Mahmood and Akhter (1995) had analysed the export growth linkages in Pakistan over the time period of 1984-1985 to 1988-89 and 1988-89 to 1992-93. Constant market share analyses of export growth have been used to estimate world trade effect, commodity composition effect, market distribution effect and the competitiveness effect. The estimated results showed that the competitiveness of the traditional exports, except rice and cotton, remained positive and improved enormously from first period to the second period. This was mainly because of comparative advantage of Pakistan in these commodities. The decreased competitiveness of cotton may have been resulted from increased protection by the USA and the European Community and the new competitive entrants of East Asia into cotton export market. Another important fact highlighted by authors in this study was that positive effects of above factors were largely offset because of concentration of exports in traditional commodities whose demand is sluggish.

Chaudhary and Kiyoshi (2001) focused on analyzing the major economic and trade policies followed in Pakistan and Japan. Moreover, the nature of trade and economic relations between the two countries had also been discussed. In order to make the study simple and understandable the changing pattern of trade of Pakistan is discussed in detail. The impacts of trade policies had been identified in terms of comparative analysis. The review of Pakistan and Japan's economic history and trade pattern indicated that both the countries had almost similar economic conditions at the end of World War II. Today Japan is leading in technology

and trade with huge trade surplus and Pakistan is suffering from not only trade deficit but also from budget deficit. This paper provides an excellent approach towards analyzing trade pattern of Pakistan. Our study will incorporate statistical estimation to analyze the future prospects of trade pattern.

Yousof (2009) has analyzed the industrial and export structure of Pakistan economy during the decades of 1990s and 2000s. He has evaluated the changes that have occurred in the structure and composition of exports over the time during the time period 1990-2007. He had constructed relative comparative advantage index and factor intensity index to analyze the competitiveness of Pakistan exports and pattern doing the last two decades. The results of RCA index had shown that out of 349 products only 51 found out to be competitive. 40 products were from manufacturing sector, 2 from agro based and 9 from crude materials group. He had also studied the liberalization reforms and found that the reforms had not changed the composition of exports of Pakistan's manufacturing sector .This study provides good understanding of the export competitiveness but the author had included lesser agro based commodity groups. Finally this study does not provide a good picture of competitiveness of exports by analyzing the RCA index alone.

III: Structure of Trade (1965-2010)

This section analyses the trends and patterns of the trade over the time period 1965-2010.The volume of trade has increased significantly since independence. Pakistan exports and imports account for 12.8% and 20% of GDP in 2009 respectively (World Bank, 2009). Table-1 and Figure-1 shows the five years average exports and imports in millions of US dollars at current market prices.

Table 1: Average exports and imports (US$ milllion at current prices)

Year	Average Exports in US million $	Average Imports in US million $
1951-55	418.4	331.1
1956-60	335.1	364.38
1961-65	435.56	836.98
1966-70	641.42	1010.5
1971-75	838.2	1,202.98
1976-80	1,532.58	3,123.44
1981-85	2,686.10	5,603.30
1986-90	4,175.14	6,284.24
1991-95	6,969.70	9,160.74
1996-00	8,400.60	10,711.64
2001-05	11,240.16	13,895.72
2006-10	17,891.54	33,723.64

Source: Economic Survey of Pakistan, various issues

Figure 1: Trend in average imports and exports (US$ million at current prices)
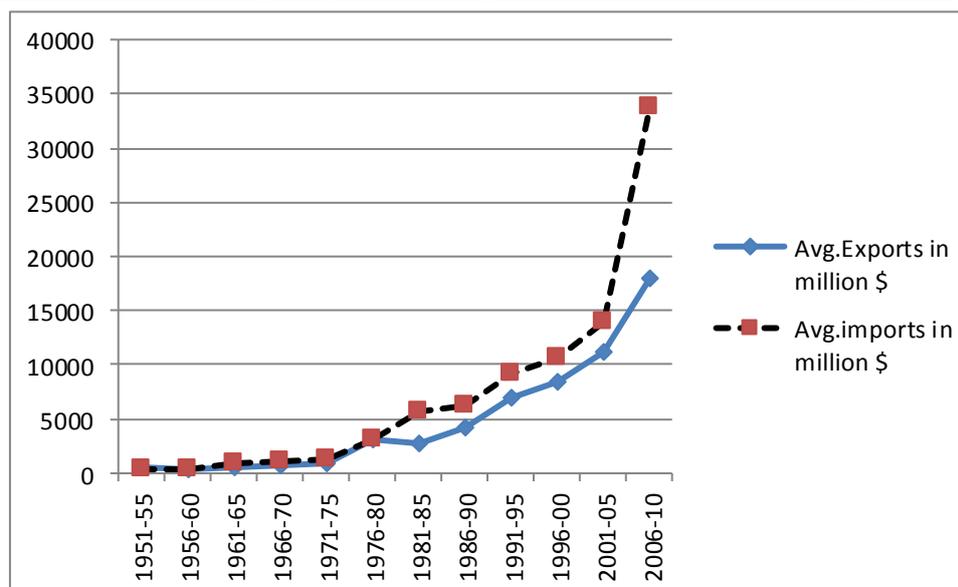
It is evident from the above table and graph that exports and imports have shown an increasing trend over the time period. Exports were as low as 418.4 million dollars in 1951 which has increased to 17,891.5 million dollars in 2009-10. Trend shows that imports are always greater than exports, except for the average of 1951-55 where imports were 331.1 million dollars. The improved export performance during 1980s was mainly due to adoption of flexible exchange rate management coupled with the launch of trade liberalization program, promotion of private sector investment, expansion of cotton and textiles and the adoption of direct export subsidies (Eken, 2001). Presently, imports are 33,723.64 million dollars.

1.1: Exports Structure

Pakistan's export structure has changed considerably over the time. Starting from the exports of raw cotton, rice and other raw materials now most of exports consist of semi manufactured and manufactured goods. However, the nature of these manufactured goods has not changed largely. Table-2 shows the average percentage share of major exportable commodities in total exports.

Numerical figures shows that cotton manufactures has been the major exportable commodity group in the last four decades. However, in 1960s, exports of cotton were low because more was demanded by indigenous textile industry. This was the decade of development when industry was booming and agriculture were progressing. The trade pattern has changed significantly since 1971 with the separation of East Pakistan. Raw wools, hides and skins had lost their importance due to high local consumption and tea was totally disappeared from exports list.

Table 2: Structure of exports (%age share)

Years	Cotton manufactures	Rice	Leather	Sports goods	Fish & fish preparations	Synthetic textiles	Other items
1960s	21.5	3	4.8	0.7	3.1	NA	66.9
1970s	43	17	5.3	1.6	2.6	NA	30.5
1980s	40.68	9.56	5.18	1.56	2.62	NA	39.2
1990s	60.2	8.1	5.6	2.9	1.9	6.6	14.5
2000s	57.4	7.5	5.8	2.2	1.2	2.8	23.1
2009-10	51.3	11.4	4.3	1.5	1.3	2.4	27.8

Source: Calculated from handbook of statistics 2010, State Bank of Pakistan

Exports of rice have been increased significantly in 1970s contributing about 17% in exports and so is the case with cotton manufactures. The 1980s and early 1990s were the golden years of rapid growth in cotton sector and downstream processing of cotton in textile industry which in turn laid the basis for substantial increase in textile related exports as indicated by a large share of cotton manufactures 60.2% in total exports and synthetic textiles i.e. 6.6% of total export. The productivity of cotton production increased due to use of better seed, increased use of pesticides and fertilizers followed by the liberalization of the pesticide industry and partial liberalization of fertilizer industry. In 2000s the share of synthetic textiles fell sharply mainly due to energy shortages that has caused shut down of many textile manufacturing units. There is a decrease in the export of fisheries and increase in rice over the above mentioned time period whereas both are in the group of primary commodities.

Table 3: Economic Classification of Exports

Years	Primary commodities	Semi-manufactures	Manufactured goods
1970s	41	19	40
1980s	28.4	18.1	53.5
1990s	13.2	19.9	66.9
2000	12.6	11	76.3
2009-2010	18	11	71

Source: Economic Survey of Pakistan 2009- 2010

Table 3 present the economic classification of exports from primary to manufactured goods. It is evident from Table that Pakistan is exporting large quantity of manufactured goods, but the point highlighted extensively in literature is nature of manufactured goods. More than three-quarters, manufactured exports are concentrated in just four industries: cotton textiles, leather products, footwear and sporting goods. The remaining one-quarter are dispersed fairly evenly over the other industry categories. Two of the four major export industries i.e. cotton textiles and leather goods accounts for almost 60% or more of total manufactured exports. These manufactured goods rely greatly on domestic raw materials, which are highly vulnerable to climatic shocks and bad harvests. The other two leading industries i.e., footwear and sporting goods, derive their comparative advantage strictly from relative factor costs. In both industries, a principal intermediate input i.e., rubber for footwear production and wood for sporting goods, is imported.

The direction of Pakistan's foreign trade hasn't changed largely since its independence. The major trading partners of Pakistan in the early years were the developed countries of West and they are still major trading partners of Pakistan. The table 4 shows the share of major markets of Pakistan exports. Each market's contribution is given by the average percentage share of that market in a given decade.

Table 4: Major markets of exports (%age share)

Countries	1960s	1970s	1980s	1990s	2000s
USA	9.5	5.77	9.8	16.84	22.62
Germany	3.9	4.71	3.425	7.2	4.21
UK	13	6.76	6.07	6.98	6.12
Japan	6.2	9.2	9.8	6.12	1.07
Hong Kong	4.4	8.7	2.348	7.26	3.426
China	4.9	3.2	3.81	1.54	3.84
Dubai	NA	NA	0.556	4.88	3.95
Saudi Arabia	1	4.19	5.91	3.12	2.64
Sub-Total	43	45.6	41.6	53.94	49.83
Other Countries	57	54.4	58.4	46.06	50.17

Source: Handbook of statistics, State bank of Pakistan

The table 5 shows that during 1986-1990 about 20.5% of exports were destined to these markets namely Netherlands, France, Italy, South Korea and India. There shares has changed over the time. The share of these countries has decreased over the time from 20.5% in 1985-1990 to 10.64% in 2006-2010. The out of 60% of other countries share in 1980s as mentioned in table 4, 20.5% was the share of these markets with Italy providing largest market to Pakistan (7.2%).

Table 5: Changing patterns of exports (5 years average %age share in total exports)

Countries	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010
Netherland	1.84	3.17	3.05	2.60	2.45
France	3.42	3.88	3.07	2.70	1.88
Italy	7.16	4.83	2.7	3.22	3.50
South korea	3.18	3.05	2.61	2.15	1.16
India	4.9	0.992	0.962	0.90	1.65
Total	20.5	15.922	12.392	11.57	10.64

The export competitiveness can be analyzed by calculating relative comparative advantage index (RCA), relative export shares (RES), commodity concentration index (CCI) and complementarities index (CI). One of the most widely used index to analyze competitiveness is relative comparative advantage index. If RCA is greater than 1 for particular commodity group, it implies that country has comparative advantage in that product.

Table 6. Revealed comparative advantage of various export families for Pakistan

Goods	Year	
	1996	**2000**
01-075 Food: Fish/Animals/Rice/Fruits	7(18)	11(18)
1-12 Beverages/Tobacco	0(3)	0(3)
222-291 Oil seeds/Cotton/Wood/Crude/Animal/Vegetable material	4(11)	6(11)
611-659 Leather/Leather goods	8(10)	9(10)
661-669 Textile Yarn/Cotton fabrics	0(4)	0(4)
667-629 Non Metal Minerals/line/Cement/Pilgrim/Cutlery	0(5)	1(5)
682-699 Manufactures of base metals	1(7)	1(7)
723-793 Machines/Transport Equipment/machinery	0(6)	0(6)
842-848 Clothing/ Apparel	4(4)	4(4)
851-822 Footwear	1(3)	2(3)
872-74 Instruments/Medical/Sciences/Toys	2(2)	2(2)
931: Misc. others	0(1)	0(1)
Aggregate	27(74)	36(74)

Source: Chaudhary, M. A.(2004). Pakistan: WTO and economic reforms, pp-39.

There are four groups for which number of items having RCA is greater than 1(see table 6). The first is food related group. There were only 7 items out of 18 commodities for which RCA was greater than 1 in 1996, and it increased to 11 in 2000. The numbers of competitive items for oil/seeds/crude materials/wool category of goods were 4 out of 11 which increased to 6 in 2000. In the case of leather/leather goods, the number of competitive items has increased from 8 in 1996 to 9 in 2000 for out of 10 commodities. The number of goods having RCA greater than one for footwear has increased from 1 in 1996 to 2 in 2000 for 3 commodities analyzed. The commodity groups for which none of the item has shown comparative advantage in 1996 and 2000 are Beverages/tobacco, textile yarn/cotton fabrics, machines/transport equipment/machinery and miscellaneous. The number of competitive items for instruments/medical commodity group, manufactures of base metal, clothing apparel have remained same in 1996 and 2000. Thus, this result shows that Pakistan has increased the number of goods in which it has comparative advantage. It should export those products for which comparative advantage has increased like leather goods, foot wear, clothing, surgical instruments, fisheries and rice.

Yousof (2009) has analyzed export competitiveness of Pakistan's manufacturing sector for 349 product lines. The relative comparative advantage index profile from 1990 to 2006 provided by him is given in Table-7. Numerical figures shows that most of our competitive manufacturing goods are dominated by labor intensive or resource based and low value added industries

Table 7: Revealed comparative advantage profile of Pakistan exports 1990-2006

Product/Category code	No.of products	RCA	1990	1995	2000	2005	2006
Agro-based products (0341-1223)	16	RCA>1	4	5	6	5	5
		RCA<1	8	6	8	10	11
Crude material (2111-2690)	56	RCA>1	12	12	10	15	15
		RCA<1	13	8	16	19	17
Manufacturing (6112-8999)	277	RCA>1	50	45	57	77	69
		RCA<1	130	137	145	181	192

Imports Pattern

Being a developing country, Pakistan imports mostly consists of machinery, petroleum products and high value added products. The Table 8 reveals the average percentage share of major import commodities to total imports.

Table 8: Structure of Imports (Avg. Percentage share)

Years	Food Items	Petroleum	Raw material	Machinery Transports	Miscellaneous	Other goods
1960s	18.5	6.8	14.9	35	2.73	21.76
1970s	20.8	14.4	18.62	25.9	2.4	17.8
1980s	19.7	15.7	22.7	26.6	2.73	12.6
1990s	15.1	18.2	18.5	28.1	2.74	18.6
2000s	9.06	25.2	18.2	25.1	2.3	20.4

Source: Calculated from Handbook of Statistics (2010), State Bank of Pakistan.

As far as composition of imports is concerned, it hasn't changed significantly over the time. There has been a modest change in imports of capital goods. Raw materials remain dominated imports throughout the period of analysis. The Table 9 shows the composition of imports as average percentage share of each decade. Numerical figures shows that a considerable amount of imported raw material goes into the production of consumer goods.

Table 9: Economic Classification of Imports

Years	Capital goods	Industrial raw material		Consumer goods
		Capital goods	Consumer goods	
1970s	35.6	7.9	35.3	20.6
1980s	33.3	6.7	44.3	15.8
1990s	35.1	5.9	44.9	14.7
2000s	31.6	7.1	49.4	11.1

Source: Calculated from Handbook of Statistics (2010), State Bank of Pakistan

The source of imports come from the developed countries because of foreign aid availability, technical assistance and availability of required machinery and from oil producing countries to meet the demand for petroleum. The Table 10 shows the average percentage share of major markets of Pakistan's imports.

Table 10: Direction of Imports (Avg. Percentage Share)

Countries	1960s	1970s	1980s	1990s	2000s
U.S.A.	33.3	17.05	11.7	9.13	6.46
Japan	9.02	7.06	13.9	9.86	4.93
Kuwait	0.31	7.35	7.03	5.61	6.3
Saudi Arabia	0.47	3.07	8.06	6.6	11.6
Germany	10.6	0.57	7.01	5.95	4.06
U.K.	13.9	11.22	6.15	4.51	2.56
Malaysia	NA	6.91	3.47	5.75	3.47
Sub-Total	67.6	46.8	54.3	47.8	35.8
Other Countries	32.4	53.2	45.7	52.2	59.7

Source: Calculated from Handbook of Statistics (2010), State Bank of Pakistan

Table 11 shows that average share of all these markets namely France, China, Italy, Singapore, India and South Korea has increased in last two decades from 18.1 in 1991-95 to 22.3% in 2006-10. China emerged as significant market for the imports of Pakistan with its average share increasing from 4.6% in 1991-95 to 11.4% in 2006-10. This could be the one reason of the decline in the imports from Japan. Imports from France, Italy and South Korea have fallen over the last two decades while India, China and Singapore have gained the share in Pakistan imports.

Table 11: Changing patterns of imports in 1990s and 2000s. (Average %age share)

Countries	1991-1995	1996-2000	2001-2005	2006-2010
France	3.64	1.96	1.20	1.22
Italy	3.716	2.70	2.86	2.26
China	4.624	4.60	6.64	11.41
Singapore	1.994	2.31	2.92	1.81
India	0.644	1.36	2.10	3.61
South Korea	3.492	3.21	2.81	1.97
Total	18.11	16.14	18.53	22.28

Source: Calculated from Handbook of Statistics (2010), State Bank of Pakistan

During the most part of the Pakistan's history imports share remain greater than exports. The table 12 present the average trade deficit as percentage of GDP.

Table 12: Trade deficit as percentage of GDP (Average %age)

Year	Trade deficit as a% of GDP (Average of 5 years)
1981-1985	9.74
1986-1990	5.78
1991-1995	4.26
1996-2000	3.64
2001-2005	2.78
2006-2010	9.86

Source: Calculated from Handbook of Statistics (2010), State Bank of Pakistan

The above table shows that trade deficit as % of GDP has decreased from 9.74% I 1981-85 to 2.78% in 2001-05. However, there is again a sharp rise in trade deficit which is around 9.86% of GDP in last five years. It has been large even than 1981-85. This hike in trade deficit was mainly because of rise in international oil prices. Around 25% of our imports consisted of petroleum products in 2000s.

IV: Methodology

2.1 Unit Root Test

Prior to forecasting for the trend of exports and imports of Pakistan, the first step is to check the stationary of variables used in the model to be estimated. The theory behind ARIMA estimation is based on stationary time series. Therefore, unit root tests have to be performed on all the variables involved to check their time series properties. For this purpose we use the Augmented Dickey Fuller (ADF) unit root test. The main purpose of using these tests is to determine whether the variables to be used in the model follow a non-stationary trend and are in fact integrated of the order 1, i.e. I(1) or whether the data follows a stationary trend and integrated of the order 0, i.e.(0).

A time series is said to be stationary if its mean, variance and co-variance are independent of time. Many macroeconomic series are non-stationary, and, therefore it is important to test their order of integration. The ADF test is referred to as the t-statistic of β_2 coefficient of the following regression:

$$\Delta X_t = \beta_0 + \beta_1 t + \beta_2 X_{t-1} + \sum_{i=1}^{k} \alpha \Delta X_{t-i} + \mu_t \ldots\ldots\ldots\ldots (4)$$

Where β_0 is a constant, t represents a time trend and variable X_{t-i} expresses the first difference with i^{th} lags. The lags are included to remove possible serial correlations in the error terms. Akaike's Information Criterion (AIC) would be used to select the optimal lag order in the model. The null hypothesis to be tested is that there is unit root in the series under consideration. Whereas, the alternate hypothesis is that there is no unit root in the series.

2.2 ARIMA (p,d,q)

ARIMA stands for Autoregressive Integrated Moving Average. This model is a combination of auto regressive and moving average terms. Auto regressive terms are the lagged values of dependent variables and moving average terms are the lagged values of the forecasts errors. ARIMA is a sequence of four steps.

    Identification

- Estimation
- Diagnosting
- Forecasting

For the identification stage, Correlogram is analyzed to identify parameters (AR(p), MA(q)) of ARIMA(p,d,q) model. Correlograms are simply the plots of autocorrelation functions and partial autocorrelation function against the lag length.

V: Results and Interpretation

3.1 Unit Root Test Results

Estimated results shows that both the series are non-stationary in their level form and are stationary in their first difference form (see Table 14 & 15). Thus, it can be concluded that EXP and IMP are integrated of order 1, I (1).

Table 14: ADF Unit Root Tests at Level Form

Series	Intercept		Intercept and Trend	
	tc	C.V. (1%)	tt	C.V.(1%)
EXP	4.059	-3.557	1.803	-4.137
IMP	3.137	-3.560	-0.029	-4.140

Note: EXP is exports at current market prices and IMP is the imports at current market prices,

t_c stands for test statistic with intercept and t_t stands for test statistic with intercept and trend.

Table 15: ADF Unit Root Tests at 1st Differenced Form

Series	Intercept		Intercept and Trend	
	tc	C.V. (1%)	tt	C.V.(1%)
ΔEXP	-4.702	-3.560	-5.067	-4.137
ΔIMP	-7.434	-3.557	-6.648	-4.140

Note: Δ represent first difference transformation.

3.2 Forecasting using ARIMA

The ARIMA Box-Jenkins approach involves three steps.

1. Identification

2. Estimation

3. Diagnostic checking

In order to identify the parameters of ARIMA or ARMA model, first step is to view correlogram to check for stationarity. Correlogram for export and import variables showed that autocorrelation function dies out slowly while partial autocorrelation function cuts off after 1 lag at zero immediately. Thus it is an autoregressive process. After taking differences data become stationary. The ARIMA model thus fitted is ARIMA (1,1,0) for imports. The statistical summary for imports is reported below.

Table 16: Summary statistics for Imports ARIMA (1,1,0)

Variable	Constant	AR(1)	D.W statistic
ΔIMP	581.76	0.148	2.103
T -statistic	1.93* (0.057)	1.13	
Ljung Box statistic for residuals (value in parenthesis are probability values)			
Q(8) = 9.247(0.235)	Q(16)= 9.524(0.849)		Q(24)=9.5883(0.994)

Note: * indicates level of significance at 10%

The Ljung Box Q-statistic shows that at respective lags of 8, 16, and 24 ACF and PACF are insignificant. The p-values in parenthesis shows insignificance that means there is no autocorrelation among residuals. It is a diagnostic test for checking the accuracy of ARIMA model. Similarly, the model selected for exports on the basis of correlogram is ARIMA (2,1,0). Its summary statistic is given below.

Table 17: Summary statistics for exports ARIMA (2,1,0)

Variable	Constant	AR(1)	AR(2)	D.W stats
D(EXP01)	319.65	0.0182	0.4749	2.08
t-statistic	1.993(0.051)**	0.142(0.88)	3.4774(0.001)*	
Ljung Box statistic for residuals (value in parenthesis are probability values)				
Q(8) = 11.00(0.088)				
Q(16)= 12.95(0.849)				
Q(24)=13.02(0.933)				

: *,** indicates significance at 1% and 5% respectively.

The above table indicates that there is no autocorrelation present in the residuals since values of Q-stats is insignificant. However at lag 8, there is significance at 10% level. The above summary statistics are based on the model chosen among other suitable ARIMA (p,d,q) on the criteria of SIC/AIC. However, the chosen model has insignificant AR(p) terms but it is the most suitable model among other models. The problem with the data is that imports and exports exhibit an exponential trend. That is why the values of coefficients may turn insignificant. This the limitation of this study and it can be further improved by using GLS-detrending data method.

The forecasts for imports and exports are presented in Table-15.

Table 18: Forecasted values of exports and imports

Years	Imports (million $)	Exports (million $)
2011	35170.37	19279.4
2012	35752.14	19599.1
2013	36333.91	19918.7
2014	3695.68	20238
2015	37497.45	20558

Thus above table shows that exports are expected to raise from 19279.4 million dollars in 2011 to 20588 million dollars in 2015. Imports are expected to rise from 35170.37 million $ in 2011 to 37497.45 million dollars in 2015.

VI: Conclusion and Policy Recommendations

The results of the study shows that composition of exports have changed significantly since 1960s as indicated by a sharp fall in the share of primary goods and increase of manufactured goods. The direction of foreign trade has shown that exports are suffering from concentration to few markets provided by USA, Japan, UK, Germany, Hong Kong and Saudi Arabia. However, their shares in Pakistan exports have changed over the time. The analysis of major imports shows that imports are concentrated in three groups namely petroleum, machinery and transport, raw materials. The share of capital goods and industrial raw material has changed marginally since 1970s whereas consumer goods fell to 11% from 20% in 1970s. The direction of imports has shown a sign of diversification in 1990s and 2000s as the total share of major trading partner fell to 35% in total imports. Forecasting results show that exports will rise to 20588 million dollars and imports 37497.45 million dollars by 2015. The the important policy implications underlying the study are that Pakistan exports are highly concentrated on agriculture commodities particularly cotton manufactures and rice, therefore there is a need to diversify exports from traditional exports to non-traditional. Exports could be increased by exploring untapped markets. Finally, Imports of industrial raw material have a significant share in total imports. Certain raw material can be produced domestically like raw cotton, silk yarn, and synthetic fiber.

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