In the Name of Allah, the Most Beneficent and Merciful!
AGRICULTURAL TRADE BETWEEN PAKISTAN AND UNITED ARAB EMIRATES: PERFORMANCE, COMPETITIVENESS AND DETERMINANTS

By

Iqbal Javed

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MBA Marketing and Agribusiness

A Thesis Submitted in Partial Fulfilment for the Degree of
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SIGNATURE OF THE STUDENT

Name: Iqbal Javed
Regd. No. 2003-ag-1630

To

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We, the Supervisory Committee, certify that the contents and form of thesis submitted by Mr. Iqbal Javed (Regd. No. 2003-ag-1630) have been found satisfactory and recommend that it be processed for evaluation by the External Examiner(s) for the award of the degree.

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Dedication
I Dedicate, This Humble Effort to Allah Almighty and Holy
Prophet Hazrat Muhammad (Peace Be Upon Him).

And I also dedicate the Fruits of My Thoughts and Study to

My Sweet Parents, lovely Supervisor,

And

The Ever-praying Caring affectionate Brothers

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ABSTRACT

Major trading partners of Pakistan are China, United Arab Emirates, Saudi Arabia and United States of America. United Arab Emirate is the trading partner of Pakistan with 10.9 percent share of total trade. Export share of Pakistan to United Arab Emirates is 8.5 percent of its total exports. Import share of Pakistan from United Arab Emirates is about 12 percent of its total imports. Major agricultural export products of Pakistan to UAE are rice, meat and cotton yarn. Major imports of agricultural products include dried vegetables, sugar and dairy products. Objective of the study was to elaborate the trade of major agricultural products between Pakistan and United Arab Emirates, with a focus on analysis of major factors affecting the agricultural trade, competitiveness and comparative advantage of major agricultural products traded between Pakistan and United Arab Emirates. Impact of different variable was determined by the application of gravity model by using the panel data methods. Variables that were used are total trade, population, GDP, distance between trading partners, and dummies for border and cultural similarities. Competitiveness in agricultural trade was estimated by nominal protection coefficient (NPC). To estimate the comparative advantage of Pakistan for specific products, approaches of revealed comparative advantage (RCA) and revealed systematic comparative advantage (RSCA) were used. For this purpose data for analysis were obtained from suitable sources. According to the results of gravity model of trade GDP of Pakistan has a positive and significant impact on agricultural trade with United Arab Emirates. GDP of United Arab Emirates has a positive and significant impact on agricultural trade between Pakistan and United Arab Emirates. Population of United Arab Emirates has positive and significant impact on agricultural trade. Increasing Population of Pakistan has a negative and significant impact on agricultural trade with United Arab Emirates. It implies that population variable has the trade inhibiting affect. It implies that a larger population size may be treated as large resource endowments and thus an indication of self-sufficiency and thereby less reliance on international trade. Dummy variable of cultural similarities has a significant and positive impact on agricultural trade and the joint border has negative and significant impact on trade of Pakistan. Distance between trading partners has a negative impact on agricultural trade but this was not significant. The value of NPC
shows that Pakistan is losing its competitiveness in basmati exports. So there was need to find other markets where its competitiveness is more as compared to United Arab Emirates. Furthermore the basmati growers should be given proper subsidies and the policies should be made to keep the domestic prices of basmati low, to make Pakistani basmati rice more competitive in international markets as compared to its main competitors. Increasing values of RCA index of basmati rice shows that Instead of losing competitiveness of basmati rice Pakistan has comparative advantage in basmati rice. There is need to maintain both the competitiveness and comparative advantage at the same time and for this purpose the government should play its role by changing the existing price policies. NPC of beef remained less as compared to Mutton that means Pakistani beef is more competitive as compared to mutton. It was concluded that Pakistan should focus more on beef for its exports growth as compared to mutton. The analysis increasing trend of RCA indices for the previous 10 years of both mutton and beef shows that the Pakistani beef has more comparative advantage as compared to mutton. Pakistani beef is more competitive having more comparative advantage showing that there are some issues in the mutton exports as compared to beef. Pakistan should try to find other markets for its mutton. Pakistan should focus on the both the mutton and beef to enlarge in export value. Pakistan has competitiveness in the cotton yarn but it is not a strong competitiveness. Pakistan has comparative advantage in export of cotton yarn. Pakistan can produce milk at low cost and can export to get high margin but due to the domestic demand it is not possible. Pakistan has strong competitiveness in milk but still is not able to export the milk to the other countries. There is need to make more growth in dairy sector and government should give more attention toward this sector. Value of NPC of sugar more than unity was showing that international prices were less than the domestic prices and Pakistan has no competitiveness in the sugar. Pakistan is an exporter of fresh vegetables but at the same time Pakistan is also importer of the dried vegetables. There is lack of value addition in vegetables. There is need of value addition in the sector of vegetable as there is demand of dried vegetables in Pakistan but there is lack of supply of the dried vegetables to fulfill its demand. Dried vegetables are imported and the Pakistani consumers pay more for these products. There is also lack of adoption of value addition in this sector.
CHAPTER 1

INTRODUCTION

Agriculture has a very important role in the economy of Pakistan with a share of about 21.1 percent to GDP. It provides 43.7 percent employment to the total labor force of the country (GOP, 2014). About 60 percent rural populations depend on agriculture (GOP, 2012).

Pakistan’s export value was US$ 20,997 million for ten months from July to April during the fiscal year 2013-14 (GOP, 2014). The imports of Pakistan amounted to about US$ 43,775 million during 2013-14 (ITC, 2014). Pakistan always has a negative trade balance. Major trading partners of Pakistan are China, Saudi Arabia, United Arab Emirates, United States, European Union Kuwait, India and Malaysia. Pakistan has about 17 percent of total trade with China. Trade share of Pakistan with United Arab Emirates was about 11 percent of its total trade with an export share of 8.5 percent and import share of 12.3 percent. Pakistan has a trade share of 9 percent with Saudi Arabia. Trade share of Pakistan with European Union is 13.0 percent. Trade flow between Pakistan and United States has been decreasing since the last few years and in 2012-13 it was only 6.7 percent with exports (13.3 percent) exceeding the imports (3.2 percent). The other countries like Kuwait, India and Malaysia have a minor trade share with Pakistan which is 4.4, 3.2 and 2.9 percent, respectively (ITC, 2014).

Major agricultural export items of Pakistan are rice, sugar, fruits, fish, fish preparations, vegetables, oilseeds, wheat, meat, cotton yarn, and raw cotton. Export value of rice was about US$ 2111 million during the fiscal year 2013-14 (ITC, 2014). Export value of fruits and vegetables were US$ 341.2 million and US$ 214.4 million respectively for a period of ten months during the fiscal year 2012-13. Pakistan has exported meat and meat preparations of about US$ 178.3 million in the same period. Export values of raw cotton and cotton yarn were US$ 138.1 million and US$ 1851.7 million respectively for ten month of the fiscal year 2012-13. Pakistan’s major agricultural imports include milk, edible oil, tea, sugar, pulses, fertilizers, insecticides, raw cotton, and silk yarn. Edible oil imports in
July-April, 2012-13 was US$ 1759.1 million. Import value of tea and pulses was US$ 323 million and US$ 282.8 million respectively. Import value of raw cotton and fertilizers was US$ 752.6 million and US$ 498.6 million respectively for the ten month period during the fiscal year of 2012-13 (GOP, 2013).

![Figure 1.1: Trade Balance of Pakistan](image)

*Source: Federal Bureau of Statistics, Islamabad-Pakistan.*

### 1.1 Trade Relation of Pakistan with United Arab Emirates

The bilateral relations between the Pakistan and United Arab Emirates are gaining new dimensions at all political and economic levels emerging into trust-worthy strategic partnership. Right from the start, United Arab Emirates has been prominent among all countries of the world due to its openhanded humanitarian assistance, tolerance, stability, innovation, and vision for better health and education. It has become a hub of investments,
re-exports and technologies. In Pakistan, it encouraged the calls for greater trade and commerce activities. United Arab Emirates is one of the biggest investors in the country and bilateral trade has been steadily growing over the years. Both countries have a strong commitment to further strengthen the bonds of friendship and want to expand the horizon of bilateral cooperation in diverse fields. About 1.4 million Pakistani expatriates are working in United Arab Emirates. Pakistan was the first country to recognize United Arab Emirates on its freedom. Ever since Pakistan and United Arab Emirates started to build bilateral relationships with each other. United Arab Emirates has now become the 2\textsuperscript{nd} major trading partner of Pakistan.

1.2 Exports of Pakistan to United Arab Emirates

Pakistan’s major export Items to United Arab Emirates include, clothing of textile fabrics, hosiery, rice, cotton fabrics, cotton yarn, sports goods, fruits, vegetables, and footwear. Major agricultural export items of Pakistan to United Arab Emirates are rice, meat, and cotton yarn. For the year of 2013-14, about 23 percent basmati rice export is only to United Arab Emirates and remaining 77 percent to other countries of the world. Second export item of Pakistan to United Arab Emirates is meat. Fresh and chilled meat of bovine animals is major export form of meat and its 37 percent export is only to United Arab Emirates. Frozen meat of bovine animal was exported to United Arab Emirates with 8.5 percent of its total export. Total 13 percent meat of sheep and goat were exported to United Arab Emirates in the year of 2013-14. Cotton yarn is also a major export item of Pakistan but its export share to United Arab Emirates is less as compared to other markets. Its export share to United Arab Emirates is only about 2.3 percent (ITC, 2014).

1.3 Imports of Pakistan from United Arab Emirates

Major imports of Pakistan from United Arab Emirates are petroleum products, precious stones, metals, plastic products, iron, steel, machinery, organic chemicals, and electrical equipment. Major Agricultural imports of Pakistan from United Arab Emirates include dried vegetables, sugar and milk. Import amount of dried vegetables was US$ 1,160 thousand in 2013-14. Sugar imports were made of about US$ 1,179 thousand from United Arab Emirates
against the total imports of US$ 6,627 thousand for 2012-13 constituting 17.7 percent. Milk and cream import value was US$ 980 thousand from United Arab Emirates in 2012-13 (TM, 2014).

1.4 Need of the Study

The world economic situation is set for revolution under free trade regime, growing competition and relative competitiveness of different economies. The study of competitiveness and comparative advantage is important to know the extent and potential of trade of agricultural commodities. This study plan is aimed at analysis of the changing competitiveness and comparative advantage of agricultural products over time and its implications for trade growth. The analysis highlighted opportunities in bilateral trade with United Arab Emirates. The approach carried out analyses of major imports and exports of agricultural products of Pakistan to United Arab Emirates. Another purpose of study was to explore the comparative advantage and competitiveness of Pakistan in agricultural trade which has effective role in efficiency of agricultural exports and imports form United Arab Emirates.

Many agricultural economists in Pakistan believed that the country is punching below its weight as far as performance of agricultural trade is concerned. In previous recent years, an extravagant importance was given to earnings of Pakistani exports but this strategy failed and the import bill reached up to twice the export earnings a year. So there was special need to focus on analyses of imports of Pakistan by comparative advantages and critically analyze the domestic growth facilities by making useful policies to reduce the burden of imports. After reviewing the literature on trade, competitiveness and comparative advantage, it was revealed that most of the work on trade export was general in nature and a few studies were found which were focused on a special target market to be lineate effect of major variables affecting export from Pakistan. However literature of competiveness and comparative advantages of Pakistani exports of agricultural products highlighted some quantitative efforts to capture the comparative advantages of major agricultural products of Pakistan generally for international markets by using a common international price. No such a
detailed study was found for a special market that has a large share in Pakistani agricultural trade that’s why the present study was planned to analyze the impact of major variables on trade and to make analysis of competitiveness and comparative advantages of major agricultural products of trade for a single market of United Arab Emirates as a trading partners.

It was necessary to calculate the nominal protection coefficient (NPC) of separate agricultural products by taking a single destination, not to make the analysis overall for the world to make policy suggestions for a single target country. Most of the studies on competitiveness of Pakistani agricultural products have been completed but there was no study made by taking the only one target market for the better analysis of the products exported. That’s why this topic “Agricultural trade between Pakistan and United Arab Emirates: performance, competitiveness and determinants” is important because United Arab Emirates is the 2nd largest trading partner of Pakistan and this market was considered to be first for analysis. United Arab Emirates is not an agricultural country and the products which are imported into Pakistan are re-exports of United Arab Emirates. After the study of comparative advantage and competitiveness of major agricultural products for United Arab Emirates as a trading partner, we will be able to make policies about the preferences of markets for our agricultural exports. After conducting the research by focusing the market of United Arab Emirates there will be need to make such research on agricultural trade with other international markets individually.

Due to not having sustained and consistent policies, prices of agriculture commodities are increasing that have a negative effect on trade of agricultural products. There was a research gap and an effort was made regarding the competitiveness and comparative advantage of agricultural products in existing circumstances to make policy suggestions about each major agricultural product being exported and imported. **1.5 Objectives of the Study**

Following are the specific objectives of the study:

1. To elaborate past trend and current status of agricultural trade between United Arab Emirates and Pakistan
2. To analyze the determinants of agricultural trade between the two countries
3. To determine the competitiveness of major agricultural products of trade
4. To suggest policy measures for promotion of agricultural trade between the countries under consideration
CHAPTER 2

REVIEW OF LITERATURE

Review of literature means to “look again” or “re-view” at the available literature in the related areas of the study. It highlights the findings of related studies and eliminate the possibilities of unnecessary duplication of efforts. It involved locating, reading and evaluating research reports, reports of causal observations and opinions that were related to research projects. It provides an opportunity to the researcher to know what has been done previously. Until it was learned what others have done and what remains still to be done in particular areas, it was difficult to plan a useful study. Thus, the review of literature forms the foundation upon which all future research work must be built. This chapter is organized as follow, section I presents findings of major studies conducted in Pakistan, section II reviews studies from other countries where as section III concludes.

2.1 Findings of Major Studies-Pakistan

Chen et al. (2002) described in his study about the competitive markets in rice trade that Pakistan had a very limited role in the imperfection condition of world rice market. In the study, general imperfect competition spatial equilibrium model was used. Model structure allowed the option for a market which is imperfect competitive to exit on both export and import side without supposing any market structure. The results of the research showed that Thailand, Vietnam and United States of America had a strong role in the imperfection of world rice market. The Japan, Philippine, Europe, and former USSR had a high degree of impact on the imperfection of world rice market. The empirical results expressed that when all trading nations comply with free trade agreement there was a welfare gain of $1,492 million.

Anjum (2003) revealed in study "Export Supply Function for Rice and Cotton" that both price and non-price factors had significant role in the export of rice. Co-integration with time series data were used in study. Furthermore export price elasticity was measured as 0.66. Domestic price in the export supply function affected more than export price in the analyses of rice and cotton. Non-price factors such as exchange rates and domestic production also
had positive impact on export supply of rice from Pakistan. An inconsistency of a proper export policy was found as central problem in case of rice export.

Mahmood (2004) analyzed export competitiveness and comparative advantage of nonagricultural products of Pakistan’s by using Balassa RCA index. He divided these commodities in four categories, competitive positioned products, threatened positioned products, emerging product and weakly positioned products on the basis of findings of RCA index. He found that agricultural sector of Pakistan witnessed a competitive position in some sectors but these competitive trends were not uniform through all sectors. Secondly Pakistan had failed to have a movement from low value-added unskilled labor to high-value added technology-intensive manufacturing.

Khan and Ashiq (2004) formulated a solid national comparative advantage regarding seed cotton production. This research also indicated the Sindh dominance over Punjab in seed cotton production from 1997 to onwards. This was basically historical restoration of Sindh dominance over Punjab in production of seed cotton. According to nominal protection coefficient (NPC), heavy weight tax was imposed upon seed cotton production in Pakistan. The study also formulated some suggestions to enhance the performance of the pointed sector as far as production and procession of seed cotton was concerned, for achieving local needs and to earn foreign remittances.

Anwar et al. (2005) conducted a research to determine the comparative advantage and competitiveness at the same time for wheat crop. They collected data from agricultural price commission, regarding the cost of production of wheat for the period of three years (2001-2003). Two main provinces were selected where the wheat production was more i.e. Sindh and Punjab. Then the data were averaged to make estimation about the national scenario. The budget about the crops were prepared at start in financial terms and after that economic prices were used to make evaluation about competitiveness and comparative advantage of wheat crop. They used Policy Analysis Matrix as an analytical framework for the policy analysis. They measured policy distortions by the use of Nominal Protection Coefficient and Effective Protection Coefficients. In the study they also used the Domestic Resource Cost ratio (DRC) for measuring the comparative advantage. The analysis about wheat was conducted for two different price regimes i.e. export parity prices and import
parity prices. Obtained results of the analysis presented that Pakistan at import parity price, had a comparative advantage only in production of wheat as an import substitution crop. They also found that, Pakistan was not competitive at export parity price in the world markets of wheat and had no comparative advantage in its production.

Ilyas et al. (2006) endorsed some features of globalization to minimize the trade obstacles and promote the export competitiveness among traders. In the study they also mentioned that many rice exporters dealt their business in Asia favorably and food crisis separated Asia into two groups, one group belonged to those countries producing rice and other belonged to those countries not producing rice. For maintaining and acquiring international competitiveness in rice export, the research used two indices i.e. Balassa and White for revealed comparative advantage and revealed competitive advantage respectively. They also concluded in the study that Pakistan was one of the most competitive country as for as rice trade was concern. They also determined that Pakistan got first rank in total merchandise exports as well as in trade agricultural products.

Akhtar et al. (2007) used the PAM methodology in their study for determination of the level of economic efficiency to know the facts about competitiveness in the rice production in Punjab, Pakistan. The results showed that the increase in the production of basmati was cause to increase the exports. Due to the lack of economic efficiency the production of coarse rice in the Punjab was the inefficient use of the resources in its production. According to their analysis both basmati and irri rice production in the Punjab demonstrated that at the farm level these had lack of competitiveness throughout the whole period under the study. They found that the structure of prevailing incentive had affected farmers negatively. They concluded that the negative divergence between the social and the private profits denoted that the intervention policy of net effect was to lower the profitability at the farm level in rice production systems in Punjab. The estimated results emphasized the severe need to eliminate distortions in existing policy to improve the structure of economic incentives for improvement in economic efficiency and for achieving the farm-level competitiveness in production of rice.

Ghani et al. (2008) measured the revealed comparative advantage for footwear industry by the application of Balassa RCA in Pakistan. They designed the analysis into two
classification; 2-digit and 4-digit HS classification. They selected the time span from 1996 – 2006 for the analysis. Finally they carried out a comparison of footwear industry of Pakistan with same industry of China and India. The two-digit level footwear industry of Pakistan shifted into comparative advantage since 2003 as Reveled Comparative Advantage index has been growing constantly over the years. The comparative advantage as far as China and India was concerned, being decreased from 2001 to onwards. While at the level of 4-digit, Pakistan showed heavy growth in 3 products at disaggregated level.

Akhtar et al. (2009) conducted a research about the global competitiveness about the exports of fruit from Pakistan (dates and oranges), by using revealed comparative advantage (RCA) approach. They analyzed and described the trends of domestic consumption among certain fruits grown by major exporters. According to their results Pakistan had comparative advantages in exports of fruits. They made a comparison about the movement in comparative advantage indices from Pakistan with its major competitors and found that Pakistan had comparatively high competitive and comparative advantages in date and mango production. The increasing competitiveness trend in Pakistan showed that there was more potential for growth; given that fruit exports were sources of greater exports earnings. They recommended that there was a need to strengthen competitiveness in that sector.

Shahbaz and Leitao (2010) carried out an economic analysis about Pakistan's intraindustry trade for the period 1980 to 2006. They used country specific characters as the variables were helpful for the study. On the basis of the study their results indicated that Intra Industry Trade was a negative function of difference in GDP per capita taken for Pakistan and its partners. They found strong statistical confirmation about the effect of same demand on trade. They introduced an economic dimension in their research as a proxy and found the positive impact on Intra Industry Trade (IIT). Their results revealed a great significance of economies of scales and a variety of all differentiated products. After getting the estimated results they confirmed hypothesis of the study i.e. the trade increase due to reduction in transportation cost.

Quddus and Mustafa (2011) conducted a study to determine the comparative advantage of wheat, sugarcane, rice and cotton in international trade. They used data from 2000 to 2005 for their study. Comparative advantage was estimated by the economic profitability and the
domestic resource cost ratio. They calculated the nominal protection coefficient (NPC) for Irri rice and found the value more than 1. They also estimated the effective protection coefficient and Domestic resource cost for Irri rice. The given relationship of input and output and the export prices do not provide Irri a comparative advantage in production in Punjab for exports. They expressed that Sugarcane growers were not receiving economic prices during 2001-2002 and 2002-2003 in importing situation, whereas NPC in 2003-04, was 1.02, indicated positive support to the sugarcane growers. The calculated NPCs for an exporting position range from 1.33 to 1.99, that indicated the prices received by the growers, were more as compared to the export parity/economic prices. That was a sign of cultivation of sugarcane for exporting was not viable in terms of economical values. The NPCs of cotton for an importing condition was less than 1 and under an exporting condition were either more than or close to 1, indicating a growth in cotton production as imports had been more costly as compared to domestic production.

Zada et al. (2011) examined the determinants of exports from Pakistan. For the study they used the time series data between the time duration of 1975-2008. Simultaneous equation model was used to find the supply and demand. Both equations were used by using the major suitable variables. They carried out country-wise disaggregated examination of Pakistan with its other major trading partners. After knowing the results they concluded that Pakistani exports were sensitively affected by the international prices and demand. They recognized the importance of factors of demand side, as world GDP, world prices and Real exchange rate which determine the exports of Pakistan to those countries. On supply side they found that the price and income were the main determinants. The results showed the demand for exports was more for the countries like Middle East, NAFTA and European Union. The study recommended additional focus and detailed study on the trade partners for these regions to enhance the export from the Pakistan.

Gul and Yaseen (2011) estimated trade potential of Pakistan by using the gravity model of trade. Panel data for period 1981-2005 for 42 countries were used in the analysis. The coefficients obtained by the model were used to predict the trade potential of country worldwide as well as in specific trading regions. Results revealed that Pakistan’s trade
potential was more with countries in the Asia-Pacific region (ASEAN), European Union (EU), Latin America, Middle East, and North America. Particularly, the maximum potential exists for Japan, Sri Lanka, Philippines, Bangladesh, Malaysia, New Zealand, Norway, Italy, Sweden, and Denmark. For that reason, Pakistan should explore means and ways to further improve its trade relationship with the countries concerned, and also focus on ASEAN, the EU, and the Middle East to increase its market share. The trade volume between Pakistan and other members of SAARC and ECO was very low, in spite of the existence of considerable potential. The major obstacles to this end were the social and political tensions among neighboring countries, mainly between India and Pakistan, which were the major players of SAARC. The same obstacles were present in case of the NAFTA and EU, where Pakistani exports were badly affected by political considerations.

Haider et al. (2011) estimated the elasticities of exports and imports of Pakistan with traditional trade partners and some Asian countries to know the trade dynamics of Pakistan from 1973 to 2008. They used the OLS for the analysis and results suggested that income was the principal factor of exports and imports. They found that the exports of Pakistan were cointegrated with USA and Japan whereas the imports of Pakistan were co-integrated with USA and United Arab Emirates. Imports and exports of Pakistan were found co-integrated with Sri Lanka and Bangladesh but not with China and India. They found that income and exchange rates were important determinants of international trade. To continue its trade with traditional partners and to make an effort for larger market access to USA and EU, Pakistan should make efforts to enlarge its trade with Asian countries especially with India and China because both countries are fast rising economies and have giant market.

Suvankulov and Ali (2012) conducted a research on ‘Recent Trends and Prospects of Bilateral Trade between Pakistan and Turkey: A Gravity Model Approach’ and they described that economic ties of Pakistan with Turkey had been improved during the last few years. A newly stated pledge to make free trade agreement between Turkey and Pakistan was likely to start a more growth in economic integration. The paper was started by reviewing trends since 1996. Then they estimated a gravity model to project trade potential of Pakistan with Turkey.
and compared the potential with actual trade flow between 1996 to 2009. They found that exports of Pakistan to Turkey had grown since surpassing both the exports of Turkey to Pakistan and the projections made by gravity model. The success of exports of Pakistan was due to the extra ordinary performance of textile industry of Pakistan. Exports of Turkey to Pakistan were good with great value addition even though still remained significantly below the predictions of the model. The analysis of trade complementarity indicated that the overall exports of Turkey matched better with import structure of Pakistan than exports of Pakistan with import structure of Turkey. The results showed that during 1996 to 2009, Pakistan registered export growth to Turkey beyond the prediction by the gravity model. Despite of more potential exports of Turkey were significantly less than the predictions made by gravity mode. For the year of 2009 model predictions about exports of Turkey were US$ 749.2 million and for that period the actual exports to Pakistan were US$ 163.1 million. The exports structure was in favor of Turkey. About 80 percent exports of Pakistan to Turkey were related to the textile and cereals and the both had limited potentials in growth due to the water and land constraints. Exports structure of Turkey to Pakistan was well diversified. The trade turnover increased when the goods produced by members were demanded for the consumption by other members of free trade agreement. This confirmed their findings from gravity model that Turkey had benefit to a larger extent from the proposed free trade agreement.

Ghafoor et al. (2013) conducted export margin analysis of Pakistani mango and estimated impact of major variables on export of mango from Pakistan to the market of United Arab Emirates. Data were collected from a representative sample of forty mango exporters selected randomly for this purpose using pre-tested questionnaire containing both structured and unstructured questions employing personal interview method. Data (average purchase prices, different elements of marketing cost and sale prices) were analyzed to estimate margins in export of mango to UAE market. The impact of major variables (experience and education of exporters, average purchase price, average marketing cost, average sale price, ISO certificate, and government policy) on mango export was quantified employing double log form of regression analysis. According to findings, gross margin was calculated as Rs.31333/ton, whereas percent and net export margins were found 52.3 percent and
Rs.11228/ton respectively. The estimated regression model revealed that education, professional experience of mango exporters, average marketing cost and ISO certificate were the significant determinants of mango exports. It may be suggested that marketing cost of exporting mango from Pakistan should be economized and quality improved to fetch premium prices in UAE market.

Akhtar et al. (2013) examined Pakistan's competitiveness in export of selected horticultural commodities by employing set of revealed comparative advantage (RCA) and revealed competitive advantage indices with respect to global trade. Results demonstrated that Pakistan had comparative and competitive advantage over the period under analysis and indicated a transition from comparative and competitive disadvantage to comparative and competitive advantage during the period under analysis. Tangerines and mandarins had maintained relatively higher revealed comparative advantage as compared to other categories for the whole period under analysis. Onion export had revealed comparative advantage with some fluctuations over time. The research indicated that Pakistan's comparative and competitive advantages had been increasing in all the selected commodities during period under analysis which indicated the potential of horticultural exports for foreign exchange earnings. There was need to strengthen comparative and competitive advantage in horticulture sector by policy support and facilitating role by all stakeholders.

2.2 Findings of Major Studies—Other Countries

Tweeten (1986) conducted a research study and explained about the comparative advantage in production of grains and soybean in the southern United States. That comparative advantage was based on output and input prices, and demand/supply under the normal circumstances with open markets. His findings of comparative advantage concluded that the southern US did not has comparative advantage in production of wool, sugar, and manufactured products of milk. On the basis of the analysis of comparative advantages of major products he suggested that these commodities, along with other additional commodities i.e.; cotton, tobacco, fruit, and vegetables, would have to be imported in the lack of price supports and trade limitations. Poultry, red meat, eggs, and milk for fluid consumption had the distinctiveness of non-traded goods. He concluded and suggested also
that in an open world market, the US would import or export only modest amounts of those commodities.

Richardson and Zhang (1999) measured trade performance of USA in 1980 and 1995 by using Balassa RCA index with 38 of its large trading partners including EU, NAFTA, China and Japan. They included broad commodity classification under SITC from SITC 1 of primary products to SITC 8 of finished manufactures. They found that US comparative advantage did not change much between 1980 and 1995 when measured worldwide on single digit product classification. When those worldwide patterns were broken to calculate RCA across regional trading partners, the aggregates were not homogenous. The results indicated different trade patterns across different parts of the world, over time and for different levels of aggregates.

Prasad (2000) identified some major determinants of exports in Fiji. He developed a single equation model for exports in which trading partner’s income and relative prices played a central role. The basic conceptual framework was an imperfect substitution model; in that model the key assumption was that in importing countries its exports were not perfect substitutes for domestic goods. A unique feature of the analysis was the incorporation of the belongings of agricultural supply-side shocks in the export equation. The results indicated that in the long run the income of trading partner mainly derived from the movements in Fiji’s exports. For the short run, Fiji exports were mainly affected by changing the factors which affected the production capacity of agriculture output, such as industrial disputes, weather conditions, relative prices and change in foreign demand.

Gbemkom and Khan (2002) examined the determinants of agricultural exports from Cameroon between 1971/72 and 1995/1996. They specified export supply functions and estimated for three export crops which were: cocoa, coffee and banana. They found Quantitative estimates by using ordinary least squares (OLS) procedure and indicated that the response of export supply of these crops to relative price change was positive, and fairly significant. Export supply of cocoa, coffee and banana was positively affected by Changes in the nature of the road network. There was a positive and significant influence of more credit to crop exporters on the export supply of all that crops. Equally, rainfall’s influence on the growth of cocoa and coffee were significant only. Structural adjustment of dummies
showed a positive effect on the supply of export of crops for policies implemented. Results showed two conclusions. First was the marginal sensitivity of crops to relative price change, means that price incentives were not adequate to generate most wanted export supply of agricultural commodities in the Cameroon. Second, to enhance the supply of exports of agricultural crops in Cameroon due to significant sensitivity of crops for the availability of credit to the exporters, improved road networks, and the particular policy changes.

Rahman et al. (2006) investigated the trade creation and trade diversion impacts of a number of RTAs (Regional Trade Arrangements) especially with a focus on SAFTA (South Asian Free Trade Area). They used the gravity model of trade for their analysis. They used many other variables instead of only gravity variables that were bilateral exchange rate and bilateral free trade agreements. They had introduced dummy variables to check the individual country effect for overall RTA. They used panel data set for the gravity model for country specific and year specific fixed effects. They used two stage estimation techniques. First stage was estimated by using tobit model and for second estimation technique they used OLS. They found significant intra-bloc export creation for SAPTA (SAARC Preferential Trading Arrangement). However, there was evidence of net export diversion in SAPTA at the same time. India, Bangladesh, and Pakistan were projected to gain from joining RTA, Sri Lanka, and Nepal were negatively affected. Other RTAs covered in the study, SADC, NAFTA, MERCOSUR, AFTA, EAC and CAN, were related with net export diversion and intra-bloc export creation. BIMSTEC was found to be intra-bloc export diverting but with no evidence of net export creation. Bangkok EU agreement (APTA) were found to be intra-bloc export diverting.

Donnet et al. (2007) indicated that despite of frequent shortages, the competitive position of basmati rice among other varieties was not be too much affected. That change might strengthen the basmati market by traders, as “Punjab” benefited from good unaided recall among consumers. They concluded that further research work might explore the key production in India. They concluded another issue about marketing of basmati and its operations with different protection schemes such as seed vs GI, and value addition might emerge among the basmati rice chain with e-auction system. It was newly demonstrated that
the competition-auction system created value addition for growers of specialty coffee that will be similar for rice especially basmati.

Kumar and Mathura (2007) studied the performance and competitiveness of export of tomato and its products from India. They studied about the production and export performance of tomatoes in India. They also determined the impact of trade liberalization on export of tomato and its products. They conducted research by focusing on the major destinations of tomato and tomato products of India. Finally they identified and analyzed the determinants of tomato export from India. They used export performance ratio (EPR) to check the export competitiveness of India for tomato and products of tomato. They calculated the Annual rate of compound growth and coefficient of variation in two periods, before and after the commencement of WTO had been determined to know the effect of trade liberalization for the performance of Indian exports in tomato and its other products. Export demand function was estimated by the use of OLS technique after identification of the factors affecting the export of Indian tomato and its products. After getting the results of the study they had suggested that the high instability in export of tomato and its products required urgent attention of policymakers to maintain hold on the international market.

Aujla et al. (2007) described that there were several constraints hindering the real potential of production and exports of fruits of Pakistan. In this study they examined the trends of production, consumption and trade of the fruits. They also described the marketing system of fruits to promote the exports and to improve international competitiveness. Information about markets received by producers was permanently partial and sketchy. Poor farmers making investment in farming for inputs like pesticides and fertilizers lead to low yields and products of poor quality. They stated that Advance sales were also a major reason of financial constraints for farmers. Lack of storage and transportation facilities resulted in 25-40 % postharvest losses that caused shrinks in supply and pressure on prices. The elimination of that losses would further expand exportable surplus and international competitiveness. Farmers only received one-fourth of consumers’ price, while lion’s share went to other market traders.

In order to reduce the shares of middlemen in the consumer’s rupee, access for credit and market information, regulate the output losses, enlargements in market infrastructure and
cheaper and easy accessibility of transport and packing material was needed. They pointed out that fruit markets were not competitive perfectly. There was need a to enhance efficiency and effectiveness to stimulate export of fruits. Product-specific market growth strategy was a need to be originated with the energetic participation in the production and marketing systems.

Kishore (2009) explained in his research that India was a major producer and exporter of rice that was a staple commodity vital to the food security. Since the India consumed 95% of its rice production, prices of rice were an integral part of country’s welfare for both consumers and producers. Protectionist trade policy actions in the year of 2008 resulting by the shortage of food concerned effectively appeared to grow the national welfare and limit the transmission of increased world prices to Indian consumers. Whereas, greater use of Indian export restrictions vs export tariffs and the power of monopoly in rice production limited the full effects of the decrease in prices. The trade restrictions had decreased the overall economic welfare even though the consumers benefited by forcing to sell products strictly in the domestic Indian markets. The paper evaluated the economic effects of trade policies in context of comparative static model that explained costs and benefits related to tariffs and subsidies.

Kang et al. (2009) analyzed the relations between rice exports and growth of economics for the world’s top four exporting countries of rice (Thailand, Vietnam, India, and the U.S) and had determined how much market power affected the economic growth of a country. The major objectives of the paper were determination the extent of economic growth impacts on country’s rice exports and also Foreign Direct Investment (FDI) impact on an ability of a country to export rice. The analysis also determined the effect of market power on the economic growth. After getting the results, they observed the market power that existed in the international rice markets because of supply of rice. Additionally, they proposed, that there was a bidirectional causality in the international rice trade and economic development of major rice exporting economies.

Camarero et al. (2010) carried out a study of ‘Evidence of the Euro effect on trade estimating gravity equations with panel co-integration techniques’ and presented new evidence on the effect of Euro on trade. They used a data set containing all bilateral combinations in a panel
of 26 countries covering the period 1967-2008. They considered two sets of variables: a standard one and a second one was built according to criticisms of Baldwin and Taglioni (2006). They implemented a new tests that allowed to solve the problems derived from the non-stationary nature of the data usually presented in the macroeconomic variables used in gravitational equations. They used panel tests that accounted for the presence of cross-section dependence as well as discontinuities in the non-stationary panel data series. They tested for co-integration between the variables using panel co-integration tests, especially the ones proposed by Banerjee and Carrión-i-Silvestre (2004). They also estimated the long-run relationship by using the CUP-BC and CUP-FM estimators proposed in Bai et al. (2009). The results obtained confirmed a smaller Euro effect than in previous research.

Hatab et al. (2010) used a gravity model approach to analyze the major factors influencing Egypt’s agricultural exports to its main trading partners for the period 1994 to 2008. Their found that one percent boost in Egypt’s GDP resulted in approximately 5.42 percent increase in agricultural export flows of Egypt. In distinction, the increase in GDP per capita of Egypt caused exports to decrease, that was attributed to increase in economic growth, in addition the increasing population and raised demand per capita for all normal goods. Therefore, domestic growth per se had condensed exports. The exchange instability had a significant positive coefficient, showing that depreciation in Egyptian Pound against the currencies of its associates stimulated agricultural exports. Costs of transportation and the proxy for distance had a negative effect on agricultural exports. These results were significant for trade policy formulation to encourage Egyptian agricultural exports to the world markets.

Kumar (2010) conducted a study about the change in the composition of livestock exports. He analyzed about the competitiveness of exports of livestock products by using the NPC indices. He also analyzed the factors that had impact on improvement and growth of exports of livestock products. After the analysis he found that exports of livestock products had increased in 1991 after trade liberalization policy. According to his findings India had competitiveness in meat exports except poultry. Export of meat of buffalo was increasing and it had a low domestic demand. The increased production, productivity and domestic policy initiatives were the main factors which were increasing the export of the livestock
items. The main finding of the study was that the increase in export supply capacity could be the main cause of export growth.

Tefaye (2011) assessed empirically the supply and demand side factors affecting export of agriculture of Sub-Saharan Africa (SSA) countries. The study focused on examining the relative importance of two major factors in determining the agricultural export performance of countries. Panel data set with the fixed effects estimation procedure was used to solve the question. This data set covered 47 SSA countries for the periods 2000-2008. The estimation result revealed that on the supply side, factors as real GDP, real GDP (lagged) of exporting country and lagged agriculture input used positively and significantly effected agricultural export of the SSA countries. He also indicated that on demand side the effect of per capita GDP of US, the chief trading partner of SSA countries, was significant and positive. Furthermore, the effect of US import tariff forced on agricultural products by SSA countries was negative and significant. Hence, the overall result reiterated that both demand side and supply side factors were equally essential in determining the export performance of agriculture of SSA countries.

Bano and Scrimgeour (2011) estimated the successful enlargement of New Zealand kiwifruit exports. They analyzed the exports for the period 1984-2009. They explored the status of the kiwifruit exports during that time. They analyzed the data for future prospects and described the challenges for industry. They prepared statistical analysis of the consumption as well as the production of kiwifrui in New Zealand and also in other countries. They conducted their study with a particular focus on Asia. They used Revealed comparative advantage to determine and check the comparative advantage of New Zealand for kiwifruit. The results showed that the main factor of kiwifruit export were the domestic and partner’s income, market size and the distance.

Coleman et al. (2011) analyzed trade prospects for new members of European Union (EU) and the EU associated partner countries. An out of sample approach was used to project the trade volumes for twenty selected countries by using the equation of gravity model for a panel data set of bilateral exports from twelve EU economies to twenty OECD (Organization for Economic Co-operation and Development) trading partners for time period of 1992-
2003. By the gravity model of new trade theory (NTT) determinants, they calculated the potential of trade volumes. The prospects of the selected twenty countries for further trade integration vis-à-vis the EU could be gauged by describing the trade volume projections as the ratio of actual trade volumes for each pair of the economies. The ratio of projected trade for the ten new member states was found to be multiples of actual levels of 2003, indicated trade growth. The values near the unity were more frequent among the Mediterranean economies, indicated fewer opportunities in the further integration of trade with the EU.

Emam and Salih (2011) conducted a study to measure the competitiveness of exports of the Sudanese sheep export from 2002 to 2007. They used the primary data for the study which were collected by appropriate questionnaire. They also used secondary data which was collected from suitable sources. They used Policy Analysis Matrix Technique for analysis. The estimated results exhibited that there was a competitiveness of Sudanese sheep, on the other hand the economic profitability was larger than the financial one. That mean the direct and indirect taxes were enforced on sheep. They concluded about the study and stated that Sudanese sheep appeared to be more profitable and competitive but at the same time it was suffered from large amount of taxes imposed by the Sudanese Government.

Kuncic (2012) examined determinants of bilateral trade with special focus on issues of institutional endogeneity and institutional measures. He put emphasis on institutional distance that could be a relevant determinant of trade than institutional quality. He found that not all institutions matter for trade. The consistent effect was that of the quality of origin and destination country’s legal institutions, which both increase trade. More importantly, he highlighted the importance of institutional distance on trade, showed that economic distance affected trade significantly and negatively. His conclusion in the research was that countries which were more similar in terms of economic institutions, trade more with each other, and the quality of legal institutions was always conducive to general trade, but surprisingly did not determine trade partners.

Roy and Rayhan (2012) conducted a study about ‘Import Flows of Bangladesh: Gravity Model Approach under Panel Data Methodology’ and they described that counterpoint to export growth, Bangladesh import growth remained less strong, despite impressive progress
in import liberalization. The estimated results of basic gravity models of Bangladesh’s import concluded that if the Bangladesh’s (importer) GDP and country J’s GDP was increased by 1 percent, import demand of Bangladesh and export supply of foreign country increase by 2.30 and 0.73 percent (ceteris paribus). The coefficient of log (distance) which reflects the trade cost, showed the estimated value -0.61 percent as a result of 1 percent increase in bilateral distance between these two countries. The results showed that with 1 percent increase of GDP, import demand of Bangladesh had increased by 0.95% and export supply of country J increased by 1.61%.

Meijers (2012) concluded a positive impact of use of internet on economic development and international trade. The study challenged that internet use did not clarify economic development directly. Specific variables of openness to international trade were highly correlated with the internet use. The outcomes in the literature that internet use had caused trade was confirmed in the study, which suggested that internet use had a positive impact on trade and the trade had a positive impacts on economic growth. The model of simultaneous equations had confirmed the positive and significant role of using internet to trade openness to the economic growth. The impact of internet use on international trade was shown more in non-high income countries as compared to high income countries. Whereas the impact of trade on the economic growth was same in non-high income and high income countries.

Shahraki et al. (2012) determined the priorities of target export market and measured comparative advantage and competitiveness of the export of dried fruits for Iran from 2004 to 2009. The result of trade comparative advantage (RTA) and Revealed Comparative Advantage (RCA) indices indicated that there was a satisfactory comparative advantage in the export of pistachio and palm between 2004 and 2009. Using Constant Market Share (CMS) index, the competitiveness of the export of pistachio and palm were negative in the majority of countries. Moreover, an inappropriate export rate of agricultural crops was distinguished by Michaely and chi-square particularly in pistachio and palm; meanwhile, it determined a lackluster business expertise. There was a competitive advantage of pistachio export in the entire period in France and Spain markets but, in the export of palm Britain had a competitive advantage. According to the results, priorities in the export of the target markets of pistachio were Hong Kong, Germany, Spain, India, Italy and France. The export
priorities of palm were India, Indonesia, Russia, Bangladesh, Malaysia, Canada and England as well.

Dianniar (2013) described that since the end of 2\textsuperscript{nd} World War, regional trade agreements had proliferated across the world. As agreements of bilateral and regional trade were becoming more prominent, it was important to discover the implications for world trade. In the previous two decades, Asian countries had been involved in many FTAs like ASEAN Free Trade Area (AFTA) and the ASEAN-China Free Trade Area (ACFTA). Indonesia, which was the member of ASEAN, had been actively participated in those cooperation. The purpose of paper was to analyze impacts of the free trade agreements on the agricultural trade of Indonesia and to investigate the reality of Linder effect on bilateral trade of Indonesia where trade would be more when the income per capita of trading economies were also more. It was focused on agricultural sector because most of the ASEAN countries, including the Indonesia, depended on that sector as a main source of GDP. Thus the gravity model was chased to examine the determinants of agricultural trade flows of Indonesia, from exports and imports side. With that objective this paper constructed basic, augmented and gravity models with the linder effects and perform cross sectional and panel data approximations. It was found that the fixed effect model was preferred than the gravity model of random effects. The results showed that the AFTA and ACFTA membership did not bring significant impact on agricultural trade of Indonesia.

Iqbal (2014) found that the European Union was the most important destination of exports of Bangladesh, which was likely to face a great challenge to grow more exports for the market of the EU in recent years. The ban on the imports of fishery products, supplier performance, limiting infrastructure, well design and less diversified exportable goods, economy instability, and non-tariff barriers were major factors which created the difficulty to grow the trading performance of Bangladesh with the EU. The paper carried out the panel data set which covered the annual exports, imports, real exchange rates, and the distance from the years of 1980 to 2010 with balance panel data to make empirically supported calculations, explored the determinants for free trade between Bangladesh and European Union to recommend an approach to enhance exports capacity of Bangladesh with EU. According to results of the study, GDP of Bangladesh was positively correlated with trade.
but the GDP of European Union and bilateral real exchange rate had a negative impact on trade. Both Bangladesh and the EU gained benefits by trading with each other. Low real exchange rate and introduction of cost effective, well-designed and diversified products could improve the exports capacity of Bangladesh with the European Union.

2.3 Summary

Reviewing available literature on trade, competitiveness and comparative advantage revealed that most of the work on trade was general in nature and a few studies were found which were focused on a special target market to lineate effects of major variables affecting the trade of Pakistan. However literature of competiveness and comparative advantages of Pakistani exports of agricultural products highlighted some quantitative efforts to capture the comparative advantages of major agricultural products of Pakistan generally for international markets for a single international price. Not a single detailed study was found for a special market that has a large share in Pakistani agricultural trade except Turkey, hence the present study was planned to analyze impact of major variables on trade of Pakistan and making analysis of competitiveness and comparative advantages of major agricultural products for a single market of United Arab Emirates as a trading partners. Many studies on Pakistani agricultural products have been completed for the exports of agricultural products. There was no research carried out by taking the single market as a destination of trade in Pakistani products.
 CHAPTER 3

MATERIALS AND METHODS

Materials and methods includes the tools and techniques of collection and analysis of data; this is applied particularly for testing the hypothesis. Methodology is defined as the logic of scientific procedure. For the successful completion of research study suitable methodology is very necessary. Research methodology includes each and every step from data collection to policy suggestions. It consists of selection of variables, collection of their data from valid sources, correct model specification and application of appropriate analytical techniques over the data to find the results.

The aim of current research was to explore the determinants of agricultural trade between Pakistan and United Arab Emirates. Competitiveness and comparative advantages of major agricultural products traded between Pakistan and United Arab Emirates were estimated by using different methods. It is imperative to define the variables to make the study more scientific. Different data collection sources and estimation techniques were used and described in this portion of the study to make the research more clear and scientific.

3.1 Data Collection and Sources

For the determinants of agricultural trade between Pakistan and United Arab Emirates, different variables were selected and panel data were used in analysis for the duration of 1975 to 2012. The data about these indicators were taken from the World Bank, Federal Bureau of Statistics Islamabad Pakistan, Pakistan Economic Survey, International Financial Statistics and International Monetary Fund. Time series data about prices of agricultural products were taken from Statistical Year Books of Pakistan, International Trade Center, and Agricultural Price Institution, Islamabad, Pakistan.

3.2 Variables of the Models for Trade Determinants

For the analysis time series data were used for the trade estimation. Variables included were GDP of Pakistan, GDP of major trading partners of Pakistan, population of
Pakistan, population of major trading partners of Pakistan and distance between Pakistan and its major trading partners. Two dummy variables were used in the analysis. i.e., joint border and cultural similarities. To determine the impacts of different variables on agricultural trade of Pakistan with United Arab Emirates as a major trading partner the total volume of bilateral trade was used as a dependent variable in the model as a proxy, because the time series data of bilateral agricultural trade were not available. Pakistan’s major portion of the trade is agricultural, and the factors which determine the overall trade also affect the agricultural trade. The percentage of agricultural trade in total trade for the duration of 2003-2013 is given in the appendix 39, to justify the use of total trade as a proxy to agricultural trade as a dependent variable. Another justification of using the data of total trade in the analysis was that because researcher used the gravity model of international trade and for the gravity model all the variables included in the gravity equation affect the trade of both agriculture and non-agriculture in a same pattern. It is the advantage of the gravity model, that the use of this proxy is more suitable as compared to any other model of the trade. Panel data of bilateral trade was taken in US$ million for the time period of 1975 – 2012. Panel data of GDP of Pakistan were taken in US$ Billion for the time period of 1975 – 2012. Data about the values of GDP of United Arab Emirates and other major trading partners of Pakistan were taken in US$ Billion, which were obtained from the World Bank database for the time period of 1975-2012. GDP is assumed to have a positive impact on trade. Data about the Population of Pakistan was found from the Statistical Year Book of Pakistan.

Data about the population of United Arab Emirates and other major trading partners of Pakistan, were taken from the World Bank database. The variable of population is assumed to have a positive impact on trade. So distance between two countries naturally determine the volume of trade between them. A dummy variable of joint Border of both the trading partners was taken for analysis to check the impact of joint border in bilateral trade. The value of dummy variables were 0 and one, zero for the trading partners that have no joint border and the value of one for those trading partners that have the joint border. Joint border is assumed to have a positive impact on bilateral trade of two trading partners. So the dummy variable of same border was used for determining the impacts on trade between
Pakistan and its main trading partner (United Arab Emirates). Another dummy variable of cultural similarities was used for the trade analysis between the trading partners. The value of dummy variable was taken one for those trading partners which have the same culture as Pakistan and the value of zero was taken for those trading partners that have entirely different culture as compared to Pakistan. The trading partners with similar cultures assumed to have a positive impact on bilateral trade.

3.3 Exports of Major Agricultural Products of Pakistan to United Arab Emirates

On the basis of values of previous 10 years three major export products of agriculture were selected that were exported to United Arab Emirates. These agricultural products were basmati rice, meat (mutton and beef) and cotton yarn. Analyses of these three major agricultural export products were conducted to check out the competitiveness and comparative advantage.

3.4 Imports of Major Agricultural Products of Pakistan from United Arab Emirates

On the basis of data of flow of agricultural products from United Arab Emirates to Pakistan, major three agricultural products with respect to value were selected for the analysis to check out the competitiveness. These three agricultural products were milk, sugar and dried vegetables.

3.5 Testing for Panel Unit Root

When dealing with the time series data for analysis, the econometric issues can affect the estimations of parameters when using the OLS. Regressing a time series variables for an analysis by using the Ordinary Least Squares (OLS) estimation can result a very high $R^2$, even when there is no meaningful relation in the variables. This situation cause a problem that is called spurious regression between entirely unrelated variables made by a nonstationary process.

All the econometrics techniques were based on the assumption that time series data is stationary. But the recent studies have shown that most of the time series data available now is non-stationary. We cannot use the statistical tools to analyze the data if the time
series were non-stationary as the results then are not appropriate. Most of the economic time series showed trend over the period of time. When such non-stationary data is used for analyses, the results produce then are although significant having high R-square value but they are spurious (Granger and Newbold, 1974). Also the tests of significance applied on trended variables become inappropriate. As the data used in the study under consideration was also of time series so it would face the problem of non-stationarity.

To check the existence of unit root in panel data different tests were used. These tests for unit root of panel data were Levin, Lin & Chu (LLC), I P, Shin W-stat, ADF - Fisher Chisquare and PP - Fisher Chi-square. If hypothesis of unit root is not rejected, then first difference is tested for presence of unit root and so on. This procedure continues until the null hypothesis of unit root is rejected.

3.6 Gravity Model of Trade

Gravity model for trade analysis is very popular which is based on the Newton’s law of gravitational force. Gravity model explains the trade quantity and capital flows between two countries. The theory of gravity was first originated in studies of physics, referring to Newton’s law of gravity (Kristjánsdóttir, 2005). Gravity model was derived from the Law of Universal Gravitation which describes the force of attraction between two objects. This law is used for the attraction of two countries with respect to mutual trade and also brief about the barriers in the attraction of both countries for expansion of mutual trade which is affected also by the trade agreements between them. When gravity model is applied in the international trade, imports and exports are considered as gravity force and economic masses are determinants of international trade. Model helps in identifying the driving forces of trade. Poyhonen (1963) and Tinbergen (1962) were the pioneer of gravity model who used the design of gravity model for trade flow. Its standard empirical framework is used to predict how the economies match up in international trade (Eichengreen and Irwin, 1997; Rauch, 1999). Many studies revealed that gravity equation is persistent with more standard models of trade and it can be transformed in gravity like equations under some assumptions (Beghin and Bureau, 2001). Standard gravity model has upgraded with many variables to check whether these variables were good and significant in explaining international trade or
not. In its basic form, Gravity model, assumes that trade between economies can be compared to gravitational force in two objects: it is directly related to size of countries and were inversely related to the distance between these countries (Krugman, 1995). According to Deardorff (1984), the experiential success of the gravity equation is because of the fact that it can clarify some real phenomena, which the theory of conventional factor endowment of trade cannot, such as, the international trade between intra industry trade, the industrialized countries, and the lack of dramatic reallocations of resources while trade liberalization process has taken place (Sanso et al., 1993).The basic model for trade between two countries (i and j) takes the form of:

\[ F_{ij} = G \left( \frac{M_i^{\beta_1} M_j^{\beta_2}}{D_{ij}^{\beta_3}} \right) \]  

(3.1)

Where \( F \) is the trade flow, \( M \) is the economic mass of each country, \( D \) is the distance and \( G \) is a constant. The model has also been used in international relations to evaluate the impact of treaties and alliances on trade, and it has been used to test the effectiveness of trade agreements and organizations such as the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO). In these models, the countries involved were said to have imperfect competition and segmented markets in homogeneous goods, which leads to intra-industry trade as firms in imperfect competition seek to expand their markets to other countries and trade goods that are not differentiated yet for which they do not have a comparative advantage, since there is no specialization. This model of trade is consistent with the gravity model as it would predict that trade depends on country size.

The reciprocal dumping model has held up to some empirical testing, suggesting that the specialization and differentiated goods models for the gravity equation might not fully explain the gravity equation. Feenstra et al. (2001) provided evidence for reciprocal dumping by assessing the home market effect in separate gravity equations for differentiated and homogeneous goods. Past research using the gravity model has also sought to evaluate the impact of various variables in addition to the basic gravity equation. A non-linear system of equations are used by Anderson and Wincoop (2003) to account for the endogenous change in these price terms from trade liberalization. A more simple method is to use a first order log-linearization of this system of equations (Baier and Bergstrand, 2003), or
exporter-country-year and importer-country-year dummy variables. For counterfactual analysis, however, one would still need to account for the change in world prices.

The traditional approach to estimate the equation 3.1, by taking logs of both sides, leading to a log-log model of the form (note: constant G becomes part of $\beta_0$):

$$\ln(F_{ij}) = \beta_0 + \beta_1 \ln(M_i) + \beta_2 \ln(M_j) - \beta_3 \ln(D_{ij}) + \epsilon_{ij}. \quad (3.2)$$

However, this approach has two major problems. First, it obviously cannot be used when there are observations for which $F_{ij}$ is equal to zero. In applied work, the model is often extended by including variables to account for language relationships, tariffs, contiguity, access to sea, colonial history, exchange rate regimes, and other variables of interest.

Gravity model for trade by using panel data set is used for the estimation of bilateral trade determination of Pakistan and variables that were used are GDP of Pakistan, GDP of trading partners of Pakistan, population of Pakistan, population of trading partners and the distance between Pakistan and its trading partners. Dummy variables of border and cultural similarities were used in the gravity model. Total volume of bilateral trade of Pakistan with its trading partners was used in the panel data set for estimation of the gravity model of trade.

Gravity models generally use cross-section data to estimate trade effects and trade relationships for a particular time period, for example one year. In reality, however, crosssection data observed over several time periods (panel data methodology) result in more useful information than cross-section data alone. The simple form of the gravity model is given below:

$$TR_{ij} = \beta_0 Y_i \beta_1 Y_j \beta_2 N_i \beta_3 N_j \beta_4 D_{ij} \beta_5 A_{ij} \beta_6 U_{ij} \quad (3.3)$$

Where $Y_i$ ($Y_j$) indicates the GDP of the country i (j), $N_i$ ($N_j$) are populations of the country i (j), $D_{ij}$ measures the distance between the two countries, $A_{ij}$ represents dummy variables, $U_{ij}$ is the error term and $\beta$s are parameters of the model.

As the gravity model is originally formulated in multiplicative form, we can linearize the model by taking the natural logarithm of all variables. So for estimation purpose,
equation 3.3 in log-linear form in year t, is expressed as, $\ln TR_{ijt} = \beta_0 + \beta_1 Y_{it} + \beta_2 Y_{jt} + \beta_3 \ln a_t + \beta_4 \ln b_t + \beta_5 \ln D_{ijt} + \Sigma \delta_h P_{ijht} + U_{ijt}$ (3.4) Where, $l$ indicates the natural logs of the variables.

$P_{ijh}$ is a sum of dummy variables. Dummy variable takes the value one when a certain condition is satisfied, zero otherwise. Using our panel data set, we estimated gravity model by using all the three methods of panel data i.e., Pooled OLS, random effects and fixed effects. For the analysis researcher followed Rahman (2003,) and Suvankulov and Ali (2012). Rahman (2003) carried out a study on

Analysis of Bangladesh’s Trade by using the gravity model and panel data. He provided theoretical justifications for using the gravity model in bilateral trade analysis. Since the dependent variable in the gravity model is bilateral trade (sum of exports and imports) between the pairs of countries, the GDP, population, distance and two dummy variables were used as independent variables. Thus the gravity model of trade in the study under consideration was:

$$\ln (TR_{ijt}) = \beta_0 + \beta_1 \ln (GDP_{it}) + \beta_2 \ln (GDP_{jt}) + \beta_3 \ln (POP_{it}) + \beta_4 \ln (POP_{jt}) + \beta_5 \ln (DIS_{ijt}) + \beta_6 (Border_{ij}) + \beta_7 (Culture_{ij}) + U_{ijt}$$ (3.5)

Where,

$i$ = Pakistan  $j$ = Trading partners of Pakistan

$TR_{ij}$ = Total trade between Pakistan country $i$ and country $j$,

$GDP_i$ ($GDP_j$) = Gross Domestic Product of country $i$ ($j$),

$POP_i$ ($POP_j$) = Population of Country $i$ ($j$),

$Distance_{ij}$ = Distance between country $i$ and country $j$,

$Culture_{ij}$ = Cultural similarities between both trading partners $i$ and $j$ (dummy variable),

$Border_{ij}$ = Land border between country $i$ and $j$ (dummy variable),

$U_{ij}$ = error term; $t$ = time period, $\beta$s = parameters.
Description of variables is given in the table 3.1 below.

**Table 3.1: Description of Variables Used in the Gravity Model**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP(_i) (Billion US$)</td>
<td>GDP of Pakistan in billions</td>
</tr>
<tr>
<td>GDP(_j) (Billion US$)</td>
<td>GDP of trading partners of Pakistan in billions</td>
</tr>
<tr>
<td>POP(_j) (Million)</td>
<td>Population of trading partners of Pakistan in millions</td>
</tr>
<tr>
<td>POP(_i) (Million)</td>
<td>Population of Pakistan in millions</td>
</tr>
<tr>
<td>DIS(_{ij}) (KM)</td>
<td>Distance between Pakistan and its ten major trading partners measured in kilo meters</td>
</tr>
<tr>
<td>BTRADE(_{ij})</td>
<td>Bilateral trade flow between Pakistan and its major trading partners</td>
</tr>
<tr>
<td>BORDER(_{ij})</td>
<td>Dummy variable of joint border having value of 1 and non-border partner with a value of 0</td>
</tr>
<tr>
<td>CULTURE(_{ij})</td>
<td>Value of dummy variable of culture 1 for those trading partners with which Pakistan has the similar culture and 0 for different culture</td>
</tr>
</tbody>
</table>

3.7 Panel Data Models

Fixed-effects and random-effects regression models were used to analyze panel data (also called longitudinal data). Panel data is a combination of cross-section and time series data. To collect panel data you collect data on the same units for two or more time periods. There are two major benefits from using panel data.

1) Panel data allows you to get more reliable estimates of the parameters of a model. There are several possible reasons for this.

   a) Panel data allows you to control for unobservable factors that vary across units but not over time, and unobservable factors that vary over time but not across units. This can substantially reduce estimation bias.

   b) There is usually more variation in panel data than in cross-section or time-series data. The greater the variation in the explanatory variables, the more precise the estimates.
c) There is usually less multicollinearity among explanatory variables when using panel data than time-series or cross-section data alone. This also results in more precise parameter estimates.

2) Panel data allows you to identify and measure effects that cannot be identified and measured using cross-sectional data or time-series data.

For example, suppose that your objective is to estimate a production function to obtain separate estimates of economies of scale and technological change for a particular industry. If you have cross-section data, you can obtain an estimate of economies of scale, but you can’t obtain an estimate of technological change. If you have time-series data you cannot separate economies of scale from technological change. To attempt to separate economies of scale from technological change, past time-series studies have assumed constant returns to scale; however, this is a very dubious procedure. If you have panel data, you can identify and measure both economies of scale and technological change.

### 3.7.1 Fixed-Effects Model

One way to take into account the “individuality” of each country or each cross-sectional unit is to let the intercept vary for each country but still assume that the slope coefficients are constant across firms. To see this, we write model as:

\[
Y_{it} = \beta_0i + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + u_{it}
\]  

(3.6)

Notice that we have put the subscript \(i\) on the intercept term to suggest that the intercepts of the ten countries may be different; the differences may be due to special features of each country, such as managerial style or managerial philosophy.

In the literature, model (3.6) is known as the fixed effects (regression) model (FEM). The term “fixed effects” is due to the fact that, although the intercept may differ across individuals (here the ten countries), each individual’s intercept does not vary over time; that is, it is time invariant. Notice that if we were to write the intercept as \(\beta_{0it}\), it will suggest that the intercept of each country or individual is time variant. It may be noted that the FEM
given in (3.6) assumes that the (slope) coefficients of the regressors do not vary across individuals or over time.

### 3.7.2 Random Effects Model

If the dummy variables do in fact represent a lack of knowledge about the (true) model, why not express this ignorance through the disturbance term uit? This is precisely the approach suggested by the proponents of the so called error components model (ECM) or random effects model (REM).

The basic idea is to start with (3.6):

\[
Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 D_{1it} + \beta_7 D_{2it} + u_{it} \tag{3.7}
\]

Instead of treating $\beta_0$ as fixed, we assume that it is a random variable with a mean value of $\beta_0$ (no subscript $i$ here). And the intercept value for an individual company can be expressed as

\[
B_{0i} = \beta_o + \varepsilon_i \quad i = 1, 2, \ldots, N \tag{3.8}
\]

Where $\varepsilon_i$ is a random error term with a mean value of zero and variance of $\sigma^2_{\varepsilon}$. What we are essentially saying is that the four firms included in our sample are a drawing from a much larger universe of such individuals and that they have a common mean value for the intercept ($= \beta_0$) and the individual differences in the intercept values of each company are reflected in the error term $\varepsilon_i$.

Substituting (3.8) into (3.7), we obtain:

\[
Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \varepsilon_i + u_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + w_{it} \tag{3.9}
\]

Where
\[ w_{it} = \epsilon_i + u_{it} \]  

(3.10)

The composite error term which consists of two components, \( \epsilon_i \), which is the crosssection, or individual-specific, error component, and \( u_{it} \), which is the combined time series and cross-section error component. The term error components model derives its name because the composite error term \( w_{it} \) consists of two (or more) error components.

3.8 Selection of Appropriate Model for Panel Analysis

When analyzing panel data, which model is most appropriate: the fixed-effects model, or the random effects model? To decide which model is most appropriate, many economists use the following criterion.

If the unit dependent unobserved effects \( (v_i) \) are correlated with one or more of the explanatory variables, then the correct model is the fixed effects model. If the unit dependent unobserved effects \( (v_i) \) are not correlated with one or more of the explanatory variables, and if they can be viewed as outcomes of a random variable, then the correct model is the random effects model. The random-effects model assumes that the unit dependent unobserved effects are not correlated with the explanatory variables. If this assumption is violated, then the random-effects estimator will yield biased and inconsistent estimates. The fixed-effects estimator will yield unbiased and consistent estimates.

It is worth noting that the fixed effects approach does not allow for estimating coefficients on time invariant variables such as distance, common border or language dummies. We have paid particular attention to the fact that gravity model not only contain time varying variables such as GDPs, exchange rate but also includes time invariant variables namely distance and border. It is worth noting that FEM does not allow for estimating time invariant variables because successful transformation wipes out such variables (Rahman, 2003). However, the pooled OLS and random effects treatment does allow the model to contain observed time invariant characteristics.
A central assumption in random effects estimation is the assumption that the random effects are uncorrelated with the explanatory variables. One common method for testing this assumption is to employ a Hausman (1978) test to compare the fixed and random effects estimates of coefficients (Wooldridge, 2002 and Baltagi, 2005).

In many situations, you may be uncertain whether the unit dependent unobserved effects ($v_i$) are correlated with one or more of the explanatory variables, and therefore uncertain whether the fixed-effects model or random-effects model is most appropriate. In these situations, you can use a Hausman test to test whether the unit dependent unobserved effects ($v_i$) are correlated with the explanatory variables. For the Hausman test, the null and alternative hypotheses are as follows.

$H_0$: $v_i$ is not correlated with $X_{it}$ (random-effects model appropriate)

$H_1$: $v_i$ is correlated with $X_{it}$ (fixed-effects model is appropriate)

To test the null hypothesis, you compare the estimates from the random-effects estimator and the fixed-effects estimator. The random-effects estimator is consistent under the null hypothesis, but inconsistent under the alternative hypothesis. The fixed-effects estimator is consistent under both the null and alternative hypotheses. If the estimates for the random-effects estimator are not significantly different from the estimates for the fixed-effects estimator, then we accept the null hypothesis and conclude that $v_i$ is not correlated with $X_{it}$, and therefore the random-effects model is the appropriate model. If the estimates for the random-effects estimator are significantly different from the estimates for the fixed-effects estimator, then we reject the null and conclude that $v_i$ is correlated with $X_{it}$, and therefore the fixed-effects model is the appropriate model. The Hausman test statistic has an approximate chi-square distribution with $k$ degrees of freedom, where $k$ is the number of slope parameters in the model.

Small p-value, by Hausman test shows that coefficient estimated by random effects model and fixed effects model were not same. The decision of rejecting the null hypothesis was made on the basis of p-value.
3.8.2 F-Test (Fixed Effects Model or Pooled OLS)

To check which model is better between Pooled OLS and FEM, we used F-Test. Pooled OLS model was used as the baseline for our comparison. We performed this significance test with an F-test resembling the structure of the F-test for $R^2$ change.

\[
F\text{-test} = \frac{(R^2_{\text{FEM}} - R^2_{\text{Pooled OLS}}) / (N-1)}{(1-R^2_{\text{FEM}})(NT-N-K)}
\]  

(3.11)

Here $T$ is the total number of temporal observations, $N$ is the number of groups or cross-sections, and $k$ is the number of regressors in the model. If we find significant improvements in the $R^2$, then there is a statistically significant group effects. Highly significant value of F test counts against the null hypothesis that the Pooled OLS model is adequate, in favor of the fixed effects Alternative

3.8.3 Breusch-Pagan LM Test (Pooled OLS or Random Effects)

For the time invariant variables the researcher can use both pooled OLS and random effect model but which model is most appropriate for the analysis in hand, was known by the Breusch-Pagan Langrang multiplier test (Breusch and Pagan, 1980). For the test of BreuschPagan Lagrange multiplier the null hypothesis is that the Pooled OLS model is appropriate and the alternate hypothesis is that the random effects model is appropriate. The decision was made on the basis of value of Breusch-Pagan LM test whether the random effects model is appropriate or Pooled OLS model.
3.9 Nominal Protection Coefficient (NPC)

Nominal protection coefficient were estimated for the export of agricultural commodities exported to United Arab Emirates. Among numerous methods applied to estimate competitiveness, Nominal Protection Coefficient (NPC) is widely used (Corden, 1971; Balassa and Achydlowsky, 1972; Gulati et al., 1990; Taylor and Philips, 1991; Chand, 1999; Kumar et al., 2001; Rakotoarisoa and Gulati, 2006). It is defined as the ratio of a commodity’s domestic price to its international reference price and that is computed as per Equation:

\[
NPC_i = \frac{P_{id}}{P_{ib} \times ER}
\]

Where:
- \( NPC_i \) is nominal protection coefficient for the \( i \)th commodity
- \( P_{id} \) is domestic price for the \( i \)th commodity in domestic currency
- \( P_{ib} \) is border price in foreign currency adjusted for the transportation, marketing and other costs. \( ER \) is the exchange rate.

The NPC fundamentally helps in measuring the divergence of domestic price from the international price and determines the degree of export competitiveness for a commodity. A ratio which is less than the unity implies a competitive advantage and if greater than unity it shows lack of competitive advantage. The assumption of NPC under an importable hypothesis is that an imported commodity competes with the domestic commodity in port or city in Pakistan. The equation 3.18 was estimated by using the data of three major agricultural exports and imports of Pakistan, included in the trade between Pakistan and United Arab Emirates. These agricultural products were basmati, meat (beef & mutton), cotton yarn, milk, sugar, and dried vegetables.

3.10 Revealed Comparative Advantage

A country’s comparative advantage, at a given point in time, depends on its pre-trade relative prices that rely on relative production costs. Data on these variables, in the presence
of factor and product market distortions, are difficult to generate. However, the comparative advantage concept can be approximated in an indirect way, by using post-trade data that manifests post-trade relative prices, prevailing factors, and product market distortions. The revealed comparative advantage approach is one of the few formal methodologies to measure a country’s intensity of comparative advantage and disadvantage in a particular industry.

Competitiveness of the country was assessed using the Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) measures of competitiveness. These measures were estimated for the periods 2003-2012.

Revealed comparative advantage is usually used to investigate shifts over time in comparative advantage of industries. This approach, however, is not meant to capture the potential future comparative advantage of a country, as RCA indices are based on actual trade data. However, RCA indices estimated across time can point to the general direction in which the pattern of comparative advantage is moving. The RCA index compares a country’s world export share of a commodity, with the country's total export share in total world exports. If a country's share of world exports of a particular commodity is greater than its share of world exports of all commodities, RCA will be greater than one. A country therefore has a revealed comparative advantage only in those products for which its market share of world exports is above its average share of world exports. In other words, the country is a relatively heavy exporter of a product under consideration and possesses a revealed comparative advantage in that product line.

RCA approach is used to estimate the Comparative advantage of a country for a specific commodity. The idea to determine a country’s strong sectors by investigating the actual export flow was pioneered by Liesner (1958). Since this procedure was polished and popularized by Balassa (1965, 1989). It is commonly known as Balassa Index. Alternatively, the actual export flows ‘reveal’ the country’s powerful sectors. So it is known as Revealed Comparative Advantage. Before describing the Balassa (1965), it is very important to note that before Balassa introduced this famous RCA index in 1965, Liesner (1958) had already contributed to the empirical work of RCA. To this end, Liesner (1958) can be argued to be first empirical study in the field of RCA. Following Leisner’s work, a complete or advanced
A measure of RCA was proposed and then presented by Balassa (1965). This latter measure was the widely accepted and modified measure of RCA in literature. The revealed comparative advantage (RCA) was used for products which are exported from Pakistan to United Arab Emirates. The RCA index, thus, categorizes industries according to ability to compete in a specific market.

RCA for a country i in industry a, \((\text{RCA}_i)_a\), can be described as:

\[
(\text{RCA}_i)_a = \frac{X_{i\, a}}{X_{w\, a}} / \frac{X_{i\, t}}{X_{w\, t}} \ldots
\]  

(3.13)

Whereas,

\(X_{i\, a}\) = Export value of commodity \(a\) by country \(i\),

\(X_{i\, t}\) = Total value of exports by country \(i\), \(X_{w\, a}\)

= World exports value of commodity \(a\); and

\(X_{w\, t}\) = Total world exports value.

Accordingly, country \(i\) exhibits revealed comparative advantage or will have a greater specialization in export of the product \(a\), than world as whole, if \((\text{RCA}_i)_a\) is more than one. In common, the higher the RCA index of a specific product, the greater a country’s comparative advantage in that specific product line. The RCA measure according to Nwachuku et al. (2010) could be made symmetric by obtaining an index called “Revealed Symmetric Comparative Advantage (RSCA)”. This is computed as \((\text{RCA}-1)/\text{RCA}+1\) and it varies from 1 to +1. The closer the value is to +1, the higher the competitiveness of a country in the commodity of interest. These two measures of RCA and RSCA were estimated for the exports of agricultural products which were basmati, meat (beef & mutton), and cotton yarn.
CHAPTER 4

RESULTS AND DISCUSSION

This chapter consists of three major parts according to the objectives of the study.
Part 1: Agricultural Trade Performance of Pakistan with United Arab Emirates
Part 2: Determinants of Agricultural Trade between Pakistan and United Arab Emirates
Part 3: Competitiveness of Agricultural Products of Trade between Pakistan and United Arab Emirates

PART 1

AGRICULTURAL TRADE PERFORMANCE BETWEEN PAKISTAN AND UNITED ARAB EMIRATES

Value of total trade of Pakistan is presented in Figure 1.1 from 1986 to 2012 with exports and imports separately. It is obviously revealed that trade balance of Pakistan is always in negative because imports were always more as compared to exports. The trade deficit was about US$ 2.5 billion in 1986, and about US$ 21 billion in the fiscal year 2012. Total exports value of Pakistan was also increasing, that was about US$ 3 billion in 1986, about US$ 8 billion in 1995, and about US$ 8.5 billion in 2000. A swift increase in exports were seen since 2003 when total exports were about US$ 11 billion, which had grown to US$12 billion in 2004, and about US$ 14 billion in 2005. The exports expanded to about US$ 19 billion in 2010, and US$ 23 billion in 2012. There was more growth in imports as compared to the value of exports. Total value of imports was US$ 5.6 billion in 1986, US$ 6.9 billion in 1990, and about US$ 10 billion in 2010. Since 2003 the total imports of Pakistan also started to increase more rapidly as compared to exports. The value of total imports of Pakistan was about US$ 34.7 billion in 2010, and US$ 44.9 billion in 2012, showing about an increase of US$ 10 billion in one year.
4.1 Trade between Pakistan and United Arab Emirates

The value of trade flow between Pakistan and United Arab Emirates is presented in Figure 4.1 for the duration 1980-2012. The value of exports from Pakistan to United Arab Emirates was US$ 184 million in 1980 whereas value of imports was US$ 373 million. The value of imports was almost double of the exports at that time. The values of exports from Pakistan exceeded the values of imports by US$ 17 million in 1987. The imports took over exports again in 1990 and caused a negative trade balance that was about US$ 39 million. But after two years the exports were again more than imports and ever since the trade balance between Pakistan and United Arab Emirates is negative. The major gap between the exports and imports was perceived in 1995 when value of total imports was about US$ 700 million whereas the value of exports was only about US$ 373 million. This gap exists with small fluctuations but unexpectedly in 2000 the imports of Pakistan from United Arab Emirates jumped to about US$ 1338 million that was more than double the value of exports. Since 2000, imports of Pakistan from United Arab Emirates, increased rapidly as compared to export growth and reached at the value of US$ 6882 million in 2011, that was three times more than exports of Pakistan to the United Arab Emirates. This speedy growth in import value continued and reached at US$ 7987 million in 2012 against exports of about US$ 2872 million in the same year (GOP, 2013).
4.2 Major Agricultural Exports to United Arab Emirates

Major agricultural export products of Pakistan to United Arab Emirates, included in the study, are rice, meat (beef & mutton) and cotton yarn which were selected on the basis of export values. Exports of rice from Pakistan to United Arab Emirates include basmati rice, broken rice and other varieties of coarse rice. Exports of beef and mutton are covered in the study in meat section.

4.2.1 Exports of Basmati Rice from Pakistan to United Arab Emirates

United Arab Emirates is the 1st leading importer of Pakistani basmati rice. The export value of Pakistani basmati to United Arab Emirates was about US$ 146 million during 201213, which was about 23 percent of total basmati rice exports, leaving 77 percent to rest of the world. The value of basmati rice exports from Pakistan to United Arab Emirates was about US$ 204 million in 2005, constituting
23 percent of total basmati exports. In 2008, exports of basmati to United Arab Emirates reached at US$ 293 million, constituting 26 percent to total basmati exports. Total export of basmati rice was at its highest point in 2008, with a value of US$ 1115 million. This unexpected upsurge in exports of basmati was due to general rise in international prices in 2007 and 2008. Other than basmati rice, 3.72 percent of other varieties of coarse rice were also exported to United Arab Emirates in 2012-13. Only 1.31 percent export of broken rice out of its total exports went to United Arab Emirates in 2012-13.
Pakistan’s 2\textsuperscript{nd} largest market of basmati rice is Oman, with a share of 11 percent to basmati exports; followed by Saudi Arabia which is recipient of about 9 percent of total Pakistani basmati export. Pakistan’s share of basmati export to Yemen, Iran, and Afghanistan, is about 8 percent, 7.9 percent and 5 percent, respectively.

Figure 4.2: Export value of Basmati Rice from Pakistan

Source: International Trade Center (ITC)
4.2.2 Exports of Meat (Beef & Mutton) from Pakistan to United Arab Emirates

Second major agricultural export product from Pakistan to United Arab Emirates is meat, containing a major part of fresh and chilled meat of bovine animals which is 41.26 percent to total exports. The export share of frozen meat of bovine animals to United Arab Emirates, was about 8.5 percent to total export value. Also, about 12 percent exports of meat (sheep & goat) were sent from Pakistan to United Arab Emirates during the year 2012-13.
United Arab Emirates is major market of Pakistani beef. Beef with a value of about US$ 40 million exported to United Arab Emirates in 2012-13, constituting a share of about 41 percent to total exports from Pakistan. Total beef exports from Pakistan to the world were about US$ 97 million in 2012-13. Export value of Pakistani mutton to United Arab Emirates was about US$ 10 million in 2012-13 which was less than export value of beef from Pakistan to United Arab Emirates.
Total export value of mutton from Pakistan was about US$ 86 million that was less than total export value beef from Pakistan, during 2012-13. In 2007 about 30 percent mutton exports were made with United Arab Emirates while in 2012 this export share declined to 12 percent. Saudi Arabia is top market for Pakistani mutton having a major share of about 37 percent to total mutton exports. Iran is the 2nd largest importer of Pakistani mutton with a value of about US$ 25 Million in 2012-13. United Arab Emirates is third import market of Pakistani mutton with a value of about US$ 10 million, during 2012-13. Fourth and fifth markets of Pakistani mutton are Bahrain and Oman with a value of about US$ 9 million and US$ 4 million, respectively.
4.2.3 Cotton Exports from Pakistan

Cotton yarn is also a major export item of Pakistan but its export share to United Arab Emirates is less as compared to other markets. Its export share to United Arab Emirates was only about 2.3 percent. Cotton industry of Pakistan is a major source of cotton exports therefore cotton products have a major share in total exports of Pakistan. Export value of cotton related items from Pakistan to United Arab Emirates was US$ 39 million in 2012. Ten year trend lines of Pakistani exports revealed that the value of export of cotton related items was declining over time. The export value of cotton related products was about US$ 90 million, US$ 53 million, and US$ 39 million in 2003, 2007 and 2012, respectively. As shown in Figure 4.7 increase in the exports value of cotton in 2008 was due to increase in international prices, hence Pakistan exported more to get more profits.
Major market of Pakistani cotton was China with a value of about US$ 1833 million in 2012, constituting 35 percent share in total cotton exports from Pakistan. Bangladesh is the 2nd largest market of Pakistani cotton with a value of about US$ 579 million in 2012. Hong Kong is 3rd largest market of Pakistani cotton with value of about US$ 229 million. Pakistan exported cotton to Turkey, Italy and Korea with a value of about US$ 185 million, US$ 150 million and US$ 144 million, respectively in 2012. Total export value of cotton yarn from Pakistan was about US$ 2102 million in 2012 and about 67 percent of this value was exported to China. Hong Kong was the 2nd largest market of Pakistani cotton yarn with a value of about US$ 191 million in 2012. Bangladesh was 3rd largest importer of Pakistani cotton yarn. Pakistan exported about US$ 5 million value of cotton yarn to United Arab Emirates during 2012-13 (ITC, 2013).

4.3 Major Imports of Agricultural Products from United Arab Emirates

Major agricultural imports of Pakistan from United Arab Emirates are dried vegetables, sugar and milk. These three products were selected on the basis of value of imports.

4.3.1 Sugar Imports from United Arab Emirates

Sugar imports from United Arab Emirates amounted to US$ 1,179 thousand against total sugar imports of US$ 6,627 thousand in 2012 constituting 17.7 percent of total sugar imports. During previous last 10 years, sugar imports from United Arab Emirates was very high in the years of 2005, 2006, 2009, and 2010 with a value of about US$ 121 million, US$ 160 million, US$ 141 million and US$ 200 million, respectively. In 2008 about 52 percent of sugar of its total sugar imports was imported from United Arab Emirates and about 75 percent of imports of sugar were made from United Arab Emirates in 2009. The share of total imports of sugar
from United Arab Emirates was low after 2009 that was about 25 percent in 2010, 18 percent in 2011 and 17 percent in 2012. As shown in Figure 4.8, Pakistan could not import sugar in 2007 and 2008, when international prices went up.

Due to domestic production, domestic demand and forecasted domestic consumption, there were great fluctuations in the value of sugar imports by Pakistan in previous years.

Figure 4.8: Value of Sugar Imports

Source: International Trade Center (ITC)

4.3.2 Milk Imports from United Arab Emirates

Total Value of milk and cream imports of Pakistan was US$ 102 million in 2012-13 whereas, in 2003, it was only about US$ 7 million. In 2003 the value of imports of milk and cream from United Arab Emirates was only 61 thousands that stretched to US$ 143 thousands in 2005. It decreased to US$ 32 thousands only in 2009 and again it started to increase, showing the value of US$ 360 thousands in 2010, 739 thousand in 2011, and 823 thousands in 2012.
4.3.3 Imports of Dried Vegetables from United Arab Emirates

Total import value of dried vegetables of Pakistan was US$ 407 million in 2012-13. The value of Imports of dried vegetables from United Arab Emirates was US$ 1,349 thousand in 2012. Previous ten year’s trend line of import flow of dried vegetable from United Arab Emirates to Pakistan, exhibited an increasing trend. Reduction in import value of dried vegetable in 2007 and 2008, was due to increase in international prices. After that when the market started to stabilize imports also started to increase every year as revealed in the Figure 4.10.
According to 2012 estimation Pakistan imported dried vegetables with value of US$ 126 million from Australia, about US$ 45 million from Myanmar, and about US$ 44 million from India. Australia is the largest supplier of dried vegetables to Pakistan.

Figure 4.10: Value of Imports of Dried Vegetable from United Arab Emirates

*Source: International Trade Center (ITC)*
PART 2

DETERMINANTS OF AGRICULTURAL TRADE BETWEEN PAKISTAN AND UNITED ARAB EMIRATES

4.4 Variables Used in the Gravity Models of Trade

Panel data were used in determination of bilateral agricultural trade of Pakistan with United Arab Emirates, by using the gravity model. The variables of the study in hand, included GDP of Pakistan, GDP of trading partners of Pakistan, population of Pakistan, population of trading partners of Pakistan and the distance of Pakistan with its trading partners. Variables of inflation rates and per capita income were dropped from the model due to multicollinearity problem. Dummy variables of border and cultural similarities were also used in the gravity model. In the model, data about ten major trading partners were used. Total volume of bilateral trade of Pakistan with trading partners was used as a dependent variable in the panel data set for estimation of the gravity model of trade.

4.4.1 Bilateral Trade between Pakistan and United Arab Emirates

To determine the impacts of different variables on bilateral agricultural trade of Pakistan with United Arab Emirates, as a major trading partner, total volume of bilateral trade was used as a proxy in the gravity model. Panel data of bilateral trade was taken in US$ million for the time duration 1975 – 2012. Time series data of bilateral trade of Pakistan with United Arab Emirate is shown in Figure 4.11. Bilateral trade data of Pakistan with its other major trading partners is given in appendix 4.
4.4.2 GDP of Pakistan

Annual values of GDP are time variant variables and were found from World Bank statistical database. All GDP values were gross values for the whole country and they were counted in US dollars, which made them easily comparable. GDP is a measure of size of country’s economy, hence countries with high GDP values are assumed to trade more with each other than countries with low GDP values. Data of GDP of Pakistan were taken in US$ billion for time duration of 1975 – 2012 as presented graphically in Figure 4.12.

Figure 4.11: Bilateral Trade between Pakistan and United Arab Emirates

Source: Federal Bureau of Statistics Islamabad, Pakistan
Figure 4.12: Gross Domestic Product of Pakistan

Source: World Bank database

4.4.3 GDP of United Arab Emirates

GDP of United Arab Emirates is a time variant variable and was taken in US$ billion. Data of GDP of major trading partners of Pakistan were taken from the World Bank database for time period of 1975-2012. The graphical presentation of time series data is given in Figure 4.13. Data about GDP of other trading partners is given in appendix 5.
4.4.4 Population of Pakistan

Data of about Population of Pakistan were taken from the World Bank. Population is another time variant variable that should be positively correlated with trade as larger markets should develop larger trade flows with each other. On the other hand, a large economy is able to produce a wider variety of goods, so in a simplistic world, such a nation should have less need for foreign imports. The graphical presentation of time series data for duration of 1975-2012 is presented in Figure 4.14.
4.4.5 Population of United Arab Emirates

Data about population of major trading partners of Pakistan were taken from the World Bank database. Population value is presented in the number of million people in a year. The variable of population is assumed to have a positive impact on trade. It can affect trade either positively or negatively. Time series data about population of United Arab Emirates, as major trading partner of Pakistan, for the years of 1975-2012. Graphical presentation is given in Figure 4.15 that showing increasing trend in population. Data about population of other major trading partners of Pakistan are given in appendix 6.
4.4.6 Distance between Trading Partners

Transportation cost is an important factor of trade. Production of same good in two or more countries in the presence of transport costs is inconsistent with factor price equalization. Moreover, different trade models might behave differently in the presence of transport cost and differences in demand across countries (Paas, 2000). Transport costs are proxied by distance. So distance between a pair of countries naturally determines the volume of trade between them. Studies based on a general equilibrium approach, (Tinbergen 1962, Pöyhönen 1963, Bergstrand, 1989 etc.) used the variables of distance between of trading partners. Oguledo and Macphee (1994), and Karemera et al. (1999) also used the variable of distance to determine trade between trading partners. The distance between the trading partners was taken in kilo meters which is a time invariant variable. The distance between Pakistan and its trading partners is given in appendix 7.

4.4.7 Border (Dummy Variable)

To know about the impact of joint border on trade, dummy variable was introduced in the gravity model. Dummy variable of joint border was used in analysis to check its impact on bilateral agricultural trade of Pakistan with its trading partners. Value
of dummy variables are 0 and one, zero for the trading partners that have no joint border and the value of one for those trading partners which have the joint border. Joint border assumed to have a positive impact on bilateral trade between two trading partners. Consequently the dummy variable of same border was used for determining its impact on agricultural trade between Pakistan and its main trading partners including United Arab Emirates.

4.4.8 Culture Similarities (Dummy Variable)

A dummy variable of cultural similarities in trading partners was used in the analysis. Some trading partners of Pakistan are Muslim countries and other has the same traditions like Pakistan. Muslim countries have some common traditions and the country like India have same culture as Pakistan because Pakistan and India were together before 1947, and most of the traditions are common in both countries. The value of dummy variable was taken one for those trading partners which have same culture as in Pakistan and the value of zero was taken for those trading partners which have entirely different culture as compared to Pakistani culture. The trading partners with similar cultures assumed to have a positive impact on bilateral trade.

4.5 Stationarity Tests

Panel data about different variables were used in the study under consideration for duration of 1975-2012. Existence of a common trend between any two data series does not always imply that there is a meaningful economic relationship between them. If the series are not stationary (i.e. their means, variance and autocovariances are not independent of time), the regressions involving these series can falsely imply the existence of a relationship. This is called as spurious regression by Granger and Newbold (1974). Ignoring this fact and estimating a regression model containing non-stationary variables might lead to wrong results. To check the existence of unit root in panel data different tests were used. These tests for unit root of panel data are Levin Lin & Chu, I P Shin W-stat, ADF - Fisher Chi-square
and PP - Fisher Chi-square. So these tests were used to check the presence of unit root in panel data of different variables and results are shown in Table 4.1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Data Type</th>
<th>Test Statistics/ Probability</th>
<th>Levin, Lin &amp; Chu t*</th>
<th>Im, Pesaran &amp; Shin W-stat</th>
<th>ADF - Fisher Chi-square</th>
<th>PP - Fisher Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPi</td>
<td>Level data</td>
<td>Test Statistics</td>
<td>-0.74</td>
<td>3.56</td>
<td>2.696</td>
<td>2.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability</td>
<td>0.22</td>
<td>0.99</td>
<td>1.000</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>Test Statistics</td>
<td>-13.97</td>
<td>-12.35</td>
<td>165.39</td>
<td>165.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>GDPj</td>
<td>Level data</td>
<td>Test Statistics</td>
<td>-1.14</td>
<td>2.50</td>
<td>20.34</td>
<td>46.88</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability</td>
<td>0.126</td>
<td>0.993</td>
<td>0.436</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>Test Statistics</td>
<td>-11.844</td>
<td>-10.86</td>
<td>143.05</td>
<td>142.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Probability</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Trade</td>
<td>Level data</td>
<td>Test Statistics</td>
<td>-1.336</td>
<td>0.83</td>
<td>18.39</td>
<td>16.66</td>
</tr>
<tr>
<td>Source: Author’s calculations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test statistics of four methods used (Levin Lin &amp; Chu, I P Shin W-stat, ADF - Fisher Chi-square and PP - Fisher Chi-square) for GDPi at level form are not significant, indicated the data as non-stationary at level form. After transferring the data of GDPi in first difference form the test statistics of all the four methods became significant, indicated that the data of GDPi after first difference, turned to stationary. Test statistics of the four methods used for GDPj at level form are not significant, indicated that the data was non stationary at level form. After transferring the data of GDPj in first difference form the test statistics of all four methods became significant, indicated that the data of GDPj after first difference, became stationary. The value of four tests for the data about POPi and POPj are significant at level form, indicated that the data was stationary at level form.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4.6 Determinants of Agricultural Trade by Using the Gravity Model

Panel data provide additional advantages, capturing relationship over variables in time and observing individual effects between trading partners (Antonucci and Manzocchi 2006; Kepapsoglou et al., 2010). For this reason, panel were used in |
the current study. According to Egger (2000), random effects model (REM) would be more appropriate when estimating trade flows between randomly drawn samples of trading partners from a larger population. While, fixed effects model (FEM) would be a better choice than REM when one is interested in estimating trade flows between a predetermined selections of nations. Since the sample includes trade exchanges between Pakistan and its trading partners, FEM might be the most appropriate estimation.

The problem faced by FEM was that it cannot directly estimate variables, which do not change over time, such as distance, common language, contiguous and colonial link, because the inherent transformation tends to wipe out such variables (Zarzoso, 2003). By using panel data set, the researcher estimated gravity model with all three methods. The current analysis of gravity model was carried out by following Rahman (2003) and Suvankulov and Ali (2012). There were many variables that could affect trade but it was necessary to quantify the effect of those variables, which had direct and indirect effect on bilateral trade. In that context, an effort was made to quantify impact of major determinants on trade of Pakistan with United Arab Emirates as a major trading partner. For this purpose; secondary panel data were collected about the variables of Pakistani bilateral trade, GDP of Pakistan, GDP of trading partners, Population of Pakistan, Population of major trading partners and distance between Pakistan and its major trading partners. Although in social science it was impossible to capture the effect of all possible independent variables, yet an effort was made to estimate all related major determinants of trade from Pakistan to United Arab Emirates as a major trading partner.

Gravity model of trade in Double log form with 1st differences was used to find the impact of various factors on trade between Pakistan and United Arab Emirates. Panel data of variables were taken for the duration of 1975 to 2012, and were used for analyzing the impact of these variables on trade. Two dummy variables were
also used in the model which was border and cultural Similarities between trading partners.

Descriptive Statistics (Minimum, Maximum, Mean, and Std. Deviation) were used to describe data of dependent and independent variables (GDP, population and distance) as presented in Table 4.2, that present the descriptive statistics of different variables used in the study related to Pakistan and its ten major trading partners including United Arab Emirates.

Table 4.2: Summary Statistics of Panel Data Used in the Gravity Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP$_I$ (Billion US$)</td>
<td>380</td>
<td>11.34</td>
<td>231.20</td>
<td>70.19</td>
<td>55.82</td>
</tr>
<tr>
<td>GDP$_J$ (Billion US$)</td>
<td>380</td>
<td>7.85</td>
<td>1624.6</td>
<td>1517.69</td>
<td>2885.00</td>
</tr>
<tr>
<td>POP$_J$ (Million)</td>
<td>380</td>
<td>0.53</td>
<td>1350.69</td>
<td>263.62</td>
<td>408.70</td>
</tr>
<tr>
<td>POP$_I$ (Million)</td>
<td>380</td>
<td>68.48</td>
<td>180.00</td>
<td>123.04</td>
<td>34.14</td>
</tr>
<tr>
<td>DISI$_J$ (KM)</td>
<td>380</td>
<td>686.00</td>
<td>10866.00</td>
<td>3967.90</td>
<td>2851.59</td>
</tr>
<tr>
<td>BTRADE</td>
<td>380</td>
<td>15.65</td>
<td>10859.97</td>
<td>1267.22</td>
<td>1635.88</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations*

The data of descriptive summary shows that mean value of GDP of Pakistan was US$ 70.19 billion and average mean value of GDP of trading partners of Pakistan was US$ 1517.69 billion. It showed that major trade of Pakistan is generally directed toward large economies. The mean value of population of Pakistan is 123.04 million, which is 140 million less as compared to its major trading partners. Mean value of distance between Pakistan and its major trading partners is 3967.9 km.
The nearest trading partner is situated 686 km away from Pakistan and maximum distance of trading partner is 10866 km.

4.7 Selection of Model

The researcher have paid particular attention to the fact that gravity model not only contain time varying variables such as GDPs and population but also includes time invariant variables namely distance, border and culture similarities. Fixed effects model does not allow for estimating time invariant variables (Rahman, 2003). However, Pooled OLS and random effects treatment does allow the model to contain observed time invariant characteristics.

Hausman specification test was used to check whether fixed effect or random effect model was appropriate. F-test was used to choose the best model between fixed effects or Pooled OLS. Breusch-Pagan LM test was used for selection of appropriate model between Pooled OLS and random effect model. To choose FEM or REM, Hausman test was used, having an asymptotic chi-square distribution.

$$H = 61.412759$$

$$P-value = \text{prob (chi-square(4) >61.412759)} = 0.0000$$

Small p-value, by Hausman test showed that coefficient estimated by random effects model and fixed effects model were not same. The significant P-value was in favor of fixed effects. When fixed effect model was found appropriate, after that F-test was applied to know whether the fixed effects model was still appropriate than Pooled OLS. The F-test had the values of required parameters. i.e.

Where, $N= 10$, $T= 380$, $K=8$, $R^2_{\text{FEM}}=0.903$, $R^2_{\text{Pooled OLS}}=0.797$

By putting the values in equation 3.11, the value of F-test was found as 43.95. Highly significant value of F test counts against the null hypothesis that Pooled OLS model was adequate, in favor of the fixed effects alternative.

After application of F-test and Hausman specification test, FEM was appropriate instead of pooled OLS and Random effects model for time variant variables. For time invariant variables one could use both Pooled OLS and random effect model.
but which model was most appropriate for the analysis was known by Bruesch-Pagan Langrang multiplier test (Breusch and Pagan, 1980). The results of Breusch-Pagan LM test are given in Table 4.3.

**Table 4.3: Results of Breusch-Pagan LM Test**

<table>
<thead>
<tr>
<th>Null hypothesis</th>
<th>Cross-section</th>
<th>Period One-sided</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>(no rand. effect)</td>
<td>One-sided</td>
<td>One-sided</td>
<td>Both</td>
</tr>
<tr>
<td>Breusch-Pagan</td>
<td>972.85</td>
<td>6.48</td>
<td>979.34</td>
</tr>
<tr>
<td>Prob</td>
<td>(0.0000)</td>
<td>(0.0109)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations*

Significant value of Breusch-Pagan LM test concluded that random effects model was appropriate instead of Pooled OLS. As a final point, after application of Hausman specification test, F-test and Breusch-Pagan LM test, it was concluded that two models were appropriate i.e., fixed effects model for time variant variables and random effects model for time invariant variables.

### 4.8 Estimation of Gravity Equation by Fixed Effects Model

On the basis of Hausman test and F-test, fixed effects model was selected for the gravity model including time variant variables and the estimated results are given in Table 4.4. In fixed effects model only time variant variables were given because time invariant variables were not used in fixed effect model. Zarzoso (2003) applied the gravity model of trade and he found that fixed effect model was more appropriate as compared to random effects gravity model.
Table 4.4: Gravity Model for Bilateral Trade of Pakistan by Fixed Effects Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2.92</td>
<td>1.04</td>
<td>2.78</td>
<td>0.0056***</td>
</tr>
<tr>
<td>DLGDP$_j$</td>
<td>0.69</td>
<td>0.01</td>
<td>44.05</td>
<td>0.0000***</td>
</tr>
<tr>
<td>DLGDP$_i$</td>
<td>0.75</td>
<td>0.12</td>
<td>6.00</td>
<td>0.0000***</td>
</tr>
<tr>
<td>LPOPi</td>
<td>-1.24</td>
<td>0.31</td>
<td>-3.93</td>
<td>0.0001***</td>
</tr>
<tr>
<td>LPOPj</td>
<td>0.63</td>
<td>0.01</td>
<td>42.31</td>
<td>0.0000***</td>
</tr>
</tbody>
</table>

Adjusted $R^2$ 0.90

Durbin-Watson stat 2.08
F-statistic 263.63
Prob (F-statistic) 0.000

Source: Author’s calculations

HAC standard errors are used for removal of heteroscedasticity
* = Significant at 5% level of confidence
***= highly significance
NS = Non Significant

According to F-test and Housman specification test, fixed effect model was considered best model for checking the impact of time variant variables on bilateral trade of Pakistan with its trading partners. The F-value was 263.63 which was highly significant, explaining the overall appropriateness of model.

According to results of fixed effect model, GDP of Pakistan was positively affecting agricultural trade between Pakistan and its trading partners. The coefficient of GDP of Pakistan was 0.75, which was highly significant. One percent increase in GDP of Pakistan would increase 0.75 percent agricultural trade between Pakistan and United Arab Emirates. The value of estimated coefficient of GDP of trading partners of Pakistan was 0.69 and found significant, explaining that one percent increase in GDP of trading partners of Pakistan cause an increases of 0.69 percent in bilateral agricultural trade of Pakistan with its trading partner. It means that with one percent increase in GDP of United Arab Emirates would increase
0.69 percent in agricultural trade of Pakistan with United Arab Emirates. According to Mohmand and Wang (2013) the coefficient of GDP in the gravity model of agricultural trade was also positive and highly significant, which implies more trade of Pakistan with larger economies.

Khan and Saqib (1993) also concluded positive and significant relationship between GDP and exports. Afzal (2004) concluded that Export contribution to GDP growth was positive and significant. Zarzoso (2003) found that the income of exporters and the importers had a positive impact on bilateral trade. Roy and Rayhan (2012) concluded that estimated coefficients on the levels of GDPs had shown highly significant at 1 percent level with expected sign. Fixed effect model was significant and estimated results concluded that with 1% increase of GDP, import demand of Bangladesh increased by 0.95% and export supply of trading partners increased by 1.61%. According to Iqbal (2014), GDP of Bangladesh was positively correlated with trade but GDP of European Union and bilateral real exchange rate had a negative impact on trade.

Population of Pakistan was negatively affecting agricultural trade of Pakistan with its trading partners. The estimated value of coefficient of population of Pakistan was -1.24 by fixed effect model, which was highly significant and it indicated that one percent increase in population of Pakistan would decrease 1.24 percent agricultural trade of Pakistan with United Arab Emirates. Zarzoso (2003) found that the Population of exporting country had negative impact on exports showing a positive absorption effect, while population of importer had a positive effect on exports, indicating that bigger economies import more than small economies. The population of Pakistan carried negative sign. It implies that population variable had trade inhibiting affect. It implies that a larger population size may be treated as large resource endowments and thus an indication of self-sufficiency and thereby less reliance on international trade. Lubinga and Kiiza (2013) found a negative impact of population of trading partners on bilateral trade flow.

Population of trading partners of Pakistan positively affected agricultural trade of Pakistan with its major trading partners. This impact was highly significant and
according to results, one percent increase in population of trading partners of Pakistan caused an increase of 0.63 percent in agricultural trade between Pakistan and its trading partners. In the model of fixed effects constant value of trade was 2.92 percent when making an analysis of trade of Pakistan with its major trading partners but when trade was considered only with United Arab Emirates, the constant value of trade between Pakistan and United Arab Emirates was 6.51 (3.59 + 2.92) as shown in appendix 40.

Collinearity (or multicollinearity) is undesirable situation where the correlations among independent variables are strong. Tolerance is a statistic used to determine how much the independent variables are linearly related to one another (multicollinear). VIF or Variance Inflation Factor is reciprocal of the tolerance. As the VIF increases, so does the variance of the regression coefficient, making it an unstable estimate. Large VIF values are indicator of multicollinearity. If the value of VIF is greater than 10 then there exists problem of multicollinearity. In our analysis, all values of VIF were less than 10 which showed no multicollinearity existed in data set (Table 4.5).

Table 4.5: Multicollinearity among Variables Used in Fixed Effects Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLGDPJ</td>
<td>8.57</td>
</tr>
<tr>
<td>DLGDPI</td>
<td>7.56</td>
</tr>
<tr>
<td>LPOPI</td>
<td>6.92</td>
</tr>
<tr>
<td>LPOPJ</td>
<td>1.22</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations*

To solve the problem of heteroscedasticity, HAC standard errors were used during the estimation of results. In most of the research Newey-West standards were used but important point is that the procedure of Newey-West standard errors are valid in large samples. Therefore if a sample is large enough one should use the Newey-West procedure for correcting standard errors in the situation of heteroscedasticity.
and also in case of autocorrelation. So the HAC method can handle both, unlike White method, which was designed specifically for heteroscedasticity. By doing so the problem of heteroscedasticity was removed and there is no need to worry about the heteroscedasticity in estimated model by fixed effects.

Autocorrelation was analyzed by the value of Durban Watson test for the estimated model. The value close to 2 was the sign of no autocorrelation in the model. If the value be less than two, means positive autocorrelation and the value more than 2 indicates the negative autocorrelation in the model. So by the value given in the model of fixed effect shows that there was no problem of autocorrelation in the estimated model.

F test and Hausman specification tests were in favor of fixed effect model that’s why this model was considered best for time variant variables. For the time invariant variables by using the Breusch-Pagan LM test, the random effects model was considered best to analyze the impact of all variables under consideration on trade between Pakistan and United Arab Emirates.

4.9 Estimation of Gravity Equation by Random Effects Model

Particular attention was given to the fact that gravity model not only contain time varying variables such as GDPs and population but also time invariant variables namely distance, culture and border. FEM does not allow for estimating time invariant variables (Rahman, 2003). However, the random effects treatment does allow the model to contain observed time invariant characteristics (Greene, 1997). Roy and Rayhan (2012) had used random effect model to estimate the impact of time invariant variables in panel data analysis by using gravity model. Multicolinearity in random effect model is shown by the value of VIF in Table 4. 6.
Table 4.6: Multicollinearity among Variables Used in the Model of Random Effects Variable

<table>
<thead>
<tr>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLGDPJ</td>
</tr>
<tr>
<td>DLGDPI</td>
</tr>
<tr>
<td>LPOPI</td>
</tr>
<tr>
<td>LPOPJ</td>
</tr>
<tr>
<td>CULTURE</td>
</tr>
<tr>
<td>BORDER</td>
</tr>
<tr>
<td>LDISIJ</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations*

All variables in the model of random effects have no problem of multicollinearity because the values of variance inflation factor were less than ten. To solve the problem of heteroscedastisity HAC standard errors were used during estimation of the results by random effects model.

As shown in estimation of random effects model in Table 4.7, GDP of Pakistan was significantly affecting agricultural trade between Pakistan and its trading partners. It means that one percent increase in GDP of Pakistan would increase about one percent agricultural trade with United Arab. GDP of trading partners of Pakistan was significant and positively affecting the agricultural trade. One percent increase in GDP of United Arab Emirates would increase 0.51 percent agricultural trade with United Arab Emirates.

Table 4.7: Estimated Gravity Model by Random Effects Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>5.53</td>
<td>2.73</td>
<td>2.02</td>
<td>0.043*</td>
</tr>
<tr>
<td>LGDPI(-1)</td>
<td>0.51</td>
<td>0.06</td>
<td>8.42</td>
<td>0.000***</td>
</tr>
<tr>
<td>LGDPI(-1)</td>
<td>1.00</td>
<td>0.28</td>
<td>3.56</td>
<td>0.000***</td>
</tr>
<tr>
<td>LPOPI</td>
<td>-1.13</td>
<td>0.73</td>
<td>-1.56</td>
<td>0.119 NS</td>
</tr>
<tr>
<td>LPOPJ</td>
<td>0.23</td>
<td>0.07</td>
<td>3.28</td>
<td>0.001***</td>
</tr>
<tr>
<td>Variable</td>
<td>Coefficient</td>
<td>Standard Error</td>
<td>z-value</td>
<td>p-value</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>----------------</td>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>CULTURE</td>
<td>1.27</td>
<td>0.18</td>
<td>6.89</td>
<td>0.000***</td>
</tr>
<tr>
<td>BORDER</td>
<td>-2.34</td>
<td>0.23</td>
<td>-10.06</td>
<td>0.000***</td>
</tr>
<tr>
<td>LDISIJ</td>
<td>-0.18</td>
<td>0.17</td>
<td>-1.02</td>
<td>0.306 <strong>NS</strong></td>
</tr>
</tbody>
</table>

HAC standard errors are used for removal of heteroscedasticity

* = Significant at 5% level of confidence
*** = Highly significant
**NS** = Non significant

Population of Pakistan has a negative effect on bilateral agricultural trade of Pakistan that was not significant. According to estimated results of random effects, one percent increase in population of Pakistan would decrease 1.13 percent agricultural trade between Pakistan and United Arab Emirates. Population of major trading partner of Pakistan has a positive effect on agricultural trade. This impact was highly significant which states that one percent increase in population of United Arab Emirates would increase about 0.23 percent agricultural trade between Pakistan and United Arab Emirates.

According to estimation of random effect model, distance was negatively affecting the bilateral trade. It shows that, an increase in distance between trading partners has a negative effect on trade but this impact was not significant. Rahman (2003) found that the transportation cost had a significant impact on Bangladesh’s trade which was negative as expected. Roy and Rayhan (2012) found that estimated coefficient on distance had shown highly significant at 1 percent level with expected sign, showed the estimated value -0.61 percent as a result of 1 percent increase in bilateral distance between two countries. Cultural similarities between trading partners has a positive impact on mutual agricultural trade, which was
highly significant relationship. The similar culture of Pakistan with its major trading partners have 1.27 percent more trade as compared to trading partners which have no cultural similarities with Pakistan.

Joint border was assumed to have a positive impact on bilateral trade but in case of Pakistan it was negative, with the fact that Pakistan have not good relations with the countries which have joint border with Pakistan, so that the impact was negative and highly significant as shown by the estimation of random effect model. The joint border countries of Pakistan have 2.3 percent less trade as compared to the countries which has no joint border. Mohmand and Wang (2013) used the gravity model and according to his results, the nonsignificance value of the common border variable was showing less trade between the nations of close proximity to Pakistan, like India, Iran, and Bangladesh etc. Pakistan needs to build decent relationship with its neighbors to gain maximum benefits by trade, being a neighbor. So it was concluded that if United Arab Emirates has the joint border with Pakistan, There was threat to trade flow between these trading partners.

According to random effects model, constant value of trade with its major top ten trading partners was 5.53 percent. But considering the trade of Pakistan with United Arab Emirates, the constant value becomes 6.15 percent of trade value as shown in appendix 41. When considering estimates of time invariant variables there may be two models for analysis. One was random effects and second was Pooled OLS model. According to Breusch and Pagan Lagrange Multiplier test for model specification, Random effect model was selected as a best model against the Pooled OLS model for the analysis by considering time invariant variables in the model.

4.10 Consistency of Results with Prior expectations

According to results of fixed effect model, GDP of Pakistan was positively affecting agricultural trade between Pakistan and its trading partners that was consistent with the prior expectations. The value of estimated coefficient of GDP of trading partners of Pakistan was found significant and consistent with prior expectations. Population of Pakistan was negatively affecting agricultural trade of
Pakistan with its trading partners. The estimated value of coefficient of population of Pakistan was -1.24 by fixed effect model, which was highly significant and consistent with the prior expectations. The population of Pakistan carried negative sign. It implies that population variable had trade inhibiting affect. It implies that a larger population size may be treated as large resource endowments and thus an indication of self-sufficiency and thereby less reliance on international trade. Population of trading partners of Pakistan positively affected agricultural trade of Pakistan with its major trading partners. This impact was highly significant and consistent with the prior expectations. According to estimation of random effect model, distance was negatively affecting the bilateral trade which was consistent with the prior expectations. Cultural similarities between trading partners has a positive impact on mutual agricultural trade, which was highly significant and consistent with prior expectations. Joint border was assumed to have a positive impact on bilateral trade but in case of Pakistan it was negative, with the fact that Pakistan have not good relations with the countries which have joint border with Pakistan, so that the impact was negative and highly significant. This result was inconsistent with the prior expectations but was consistent with Mohmand and Wang (2013) who used the gravity model and according to his results; the non-significance value of the common border variable was showing less trade between the nations of close proximity to Pakistan, like India, Iran, and Bangladesh etc. Pakistan needs to build decent relationship with its neighbors to gain maximum benefits by trade, being a neighbor.
PART 3

COMPETITIVENESS OF AGRICULTURAL PRODUCTS OF TRADE BETWEEN PAKISTAN AND UNITED ARAB EMIRATES

Conceptually, competitiveness is defined as the ability of a country to offer products and services that meet local and international quality standards, worth domestic and global market prices, and provide adequate returns on the resources used in producing them. Competitiveness can also be defined as the ability to face and to be successful when facing competition (Latruffe, 2010). By the definition offered by Latruffe (2010), competitiveness is the ability to sell products that meet demand requirements (price, quality, quantity) and at the same time, ensure profits over time. Several measures of competitiveness suggested in trade theory have been applied in various research works carried out in Europe, Asia, USA, and Africa. These measures are the real exchange rate and purchasing power parities (Brinkman, 1987), revealed comparative advantage and derived indicators (Balassa, 1965; Vollrath, 1991), The net export index (NEI) (Banterle and Carraresi, 2007), Grubel-Lloyd measure (Banterle and Carraresi, 2007) and the revealed symmetric comparative advantage (Nwachuku et al, 2010).

In most of the developing countries, social or economic profitability deviates from private profitability because of distortions in factor and output markets, externalities and government policy interventions, that tend to distort relative prices. It is, therefore, necessary to assess the comparative advantage of the production of major crops in Pakistan. The analysis of comparative advantage can help in deriving meaningful policy conclusions on how to transform the farming system towards more efficient crops activities under Global price fluctuating situation (Mustafa and Quddus, 2012). The downward trend of real food prices for the past 25 years came to an end when world prices started to rise in 2006 and escalated into a surge of price inflation in 2007 and 2008. Projections suggest that they would likely to remain relatively high in next few years, although at a lower level (FAO, 2008). All these have profound impact on developing countries including Pakistan under international rules and regulations. Pakistan, as a member
of WTO, is committed to rules and regulations that the Uruguay Round (UR) applied to agriculture. However, eventually, whether or not a country can take advantage of the new trading opportunities would depend upon its comparative advantage, without subsidies or with limited subsidies that are permitted for all trade. As agriculture is a dominant sector of Pakistan, government policies that promote agricultural production in general or affect relative incentives within agriculture can have substantial economy-wide effects (Krueger et al., 1988).

Agricultural trade between Pakistan and United Arab Emirates is under consideration to make analysis to give the policy recommendations. An effort is made by calculating the approaches of nominal protection coefficient, revealed comparative advantage, and revealed systematic comparative advantage. Major agricultural exports products of Pakistan to United Arab Emirates are rice, meat, and cotton yarn while major agricultural import products are dried vegetable, milk, and sugar. These import products are re-exports of United Arab Emirates because these are not directly produced in United Arab Emirates. These products are included in the analysis to make an estimation about prevailing conditions and to make assessment about competitiveness and comparative advantages of these agricultural products.

Mahmood (2004) analyzed comparative advantage for Pakistan’s non-agricultural sector. Hanif and Jafri (2008) studied RCA for Pakistan textile sector, and Mehmood et al. (2012) focused on chemicals sector. Only a few studies have attempted to analyze actual comparative advantage for Pakistan’s agricultural exports. For example, Akhtar et al. (2009) constructed RCA index for Pakistan’s fruit exports. Samaratunga et al. (2007) and CARIS (2008) considered the country’s revealed comparative advantage for a few broad categories of agricultural products. Riaz (2009) estimated RCA indices for a fairly wide range of agricultural products, using world market for each product as reference market. However, to better understand the factors that limit Pakistan’s agricultural trade potential with its individual trading partner, there was need to identify specific markets and products where the country enjoys demonstrated comparative
advantage. Sharif et al. (2007) calculated export margins of kinnow for the markets of Middle East, Far East, Europe and Russia. Quddus and Usman (2011) calculated nominal protection coefficient (NPC) of major crops including basmati, paddy, irri, sugarcane and cotton for the period of 2001-2005. They did not calculate nominal protection coefficient (NPC) for a specific targeted market. Mustafa and Quddus (2012) calculated nominal protection coefficient (NPC) of agricultural products for a period of 2001-2009. Khalid and Jansen (2012) analyzed revealed comparative advantages of Pakistan’s agricultural exports with regions of SARC, ASEAN, GCC, sub Saharan Africa and North Africa. They calculated RCA of Dairy products, cereals, vegetables and fruits. They also calculated RCA of these products with individual neighbor countries. They calculated RCA for exports during 1999-2008. Akhtar et al. (2013) calculated RCA of combined group of fruit and vegetables as a single commodity. They used data for the duration 1990 to 2009. There was no study made by keeping only one market for better analysis of the products exported to that particular country.

United Arab Emirates is not an agricultural country and these products are its reexports. United Arab Emirates is major market with a large number of middle men. From that market the products are supplied to different markets of other countries. The export prices in United Arab Emirates is less and import prices is more when make a comparison with other countries of the world that’s why after the study of comparative advantage and competitiveness with United Arab Emirates as a trading partner we will be able to change the direction of our agricultural exports to high valued markets and import products from that markets or regions where the prices are low. There is need to check the competitiveness and comparative advantage of agricultural products in existing circumstances to make policy suggestions regarding each major export and import of agricultural products.
4.11 Competitiveness of Pakistan’s Major Agricultural Exports to United Arab Emirates

Pakistan is blessed with diverse agro-climatic conditions, which are conducive for growing various crops around the year with one of the best irrigation systems in the world (Akhter, 1998). Rapidly changing international trade scenario led by WTO rules and regulations, competition in international market is getting more intensified specially with the emergence of new foreign trade players. As Mustafa (2003) has pointed out that, the ability of the country to maintain or expand its world market share depends upon its ability to meet the demands of the world trading system, not only in terms of competitive price but also quality of exportable products and their safety standards. Being the signatory of WTO, Agreement on Agriculture, Pakistan has to restructure its foreign trade policies. Pakistani exports of major Agricultural products to United Arab Emirates, are basmati rice, mutton, beef and cotton yarn. By keeping in mind the United Arab Emirates as a trading partner the competitiveness of these export products were estimated by using the nominal protection coefficient (NPC) approach.

4.11.1 Basmati Rice

The NPC values of basmati rice were calculated for the years of 2003-2012 to check the competitiveness trend of Pakistani basmati rice as shown in Table 4.8. The value close to zero shows more competitiveness while the values close to unity shows less competitiveness. In 2003, the value of NPC was 0.57 that was less competitive as compared to 2004 and 2005 (NPC= 0.40). Throughout time period under consideration, basmati remained more competitive in 2007 as shown by the value of its NPC that is 0.26. In 2008, NPC value became 0.38 which exhibited more competitiveness in 2007 as compared to 2008. Afterwards, in 2009 NPC value was 0.37 in 2009 and 0.36 in 2010 that was again getting competitiveness in basmati rice but unfortunately the value of NPC in the year of 2011 became 0.89 that showed that basmati rice was losing its competitiveness. The value of NPC in 2012 was 0.91 which is showing that Pakistan have little competitiveness in
basmati exports. Basmati rice of Pakistan has competitiveness in international markets whereas before a decade it had more competitiveness.

Throughout the duration under the consideration, basmati was less competitive in 2012 as shown by the value of NPC which is 0.91. It was due to the reason that Pakistani basmati exports were suffering problems and exporters worried about that situation when domestic prices increased but there was no increase in the international prices of basmati, hence Pakistan was not performing well as compared to its other competitors especially India. Because the United Arab Emirates exports the basmati at high prices in international markets so that’s why Pakistan is losing its competitiveness in United Arab Emirates. Pakistan should try to search other markets to sell its basmati where the prices are more as compared to United Arab Emirates. Pakistan should not concentrate on only the market of United Arab Emirates, because throughout time under consideration, NPC value showed that basmati is losing its competitiveness in United Arab Emirates.

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Protection Coefficient (NPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.57</td>
</tr>
<tr>
<td>2004</td>
<td>0.40</td>
</tr>
<tr>
<td>2005</td>
<td>0.40</td>
</tr>
<tr>
<td>2006</td>
<td>0.34</td>
</tr>
<tr>
<td>2007</td>
<td>0.26</td>
</tr>
<tr>
<td>2008</td>
<td>0.38</td>
</tr>
<tr>
<td>2009</td>
<td>0.37</td>
</tr>
<tr>
<td>2010</td>
<td>0.36</td>
</tr>
</tbody>
</table>
Pakistan has competitiveness in both beef and mutton for the time under consideration for 2003-2012. In 2003 NPC of Pakistani beef was 0.56 that was showing more competitiveness as compared to the years of 2004, 2005 and 2006. Again in 2008 the NPC value decreased to 0.51 showing more competitiveness. In 2012 beef became less competitive with a NPC value of 0.87 as shown in Table 4.9.

Table 4.9: Nominal Protection Coefficient (NPC) of Meat (Beef & Mutton)

<table>
<thead>
<tr>
<th>Year</th>
<th>NPC of Beef</th>
<th>NPC of Mutton</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.56</td>
<td>0.79</td>
</tr>
<tr>
<td>2004</td>
<td>0.70</td>
<td>0.87</td>
</tr>
<tr>
<td>2005</td>
<td>0.86</td>
<td>0.98</td>
</tr>
<tr>
<td>2006</td>
<td>0.74</td>
<td>0.97</td>
</tr>
<tr>
<td>2007</td>
<td>0.67</td>
<td>0.87</td>
</tr>
<tr>
<td>2008</td>
<td>0.51</td>
<td>0.60</td>
</tr>
<tr>
<td>2009</td>
<td>0.64</td>
<td>0.82</td>
</tr>
<tr>
<td>2010</td>
<td>0.59</td>
<td>0.72</td>
</tr>
<tr>
<td>2011</td>
<td>0.67</td>
<td>0.89</td>
</tr>
<tr>
<td>2012</td>
<td>0.87</td>
<td>0.95</td>
</tr>
</tbody>
</table>
NPC of beef of Pakistan remained less as compared to mutton showing that Pakistani Beef is more competitive as compared to mutton. The comparison of both NPCs of mutton and beef for the period of 2003-2012, indicated that Pakistani beef is more competitive as compared to mutton because its NPC value is less than mutton. Pakistan should try to focus more on beef as compared to mutton because the NPC values shows that the Pakistani beef is more competitive as compared to mutton. For mutton Pakistan should try to find other markets of the world where the NPC values are less as compared to the United Arab Emirates.

4.11.3 Cotton Yarn

Throughout the duration under study for the period of 2003-2012, Pakistan has competitiveness in cotton yarn as shown in the Table 4.10. Pakistan has value of NPC less than 0.5 for the year 2008, while for all other years under the study the values of NPC were more than the 0.5. For the year 2011 and 2012, NPC values were 0.98 and 0.90, respectively, showing less competitiveness. It means Pakistan has competitiveness in the cotton yarn but it is not strong competitiveness which indicated presence of potential in this sector. Pakistani cotton industry is emerging with time, since the exports of value added products of cotton has been increasing and it is more profitable as compared to exports raw products.

Table 4.10: Nominal Protection Coefficient (NPC) of Cotton Yarn

<table>
<thead>
<tr>
<th>Year</th>
<th>(NPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.60</td>
</tr>
<tr>
<td>2004</td>
<td>0.61</td>
</tr>
<tr>
<td>2005</td>
<td>0.58</td>
</tr>
<tr>
<td>2006</td>
<td>0.51</td>
</tr>
<tr>
<td>2007</td>
<td>0.52</td>
</tr>
<tr>
<td>2008</td>
<td>0.40</td>
</tr>
</tbody>
</table>
Since 2011 Pakistan is not performing well in the exports of cotton yarn to United Arab Emirates, which is shown from the estimated values of NPC indices. There is need to shift toward the value addition in this sector. If Pakistan lose its competitiveness in cotton yarn than it should no need to worry about it and should try to find the other markets where it can enjoy its competitiveness.

4.12 Competitiveness of Pakistan’s Major Agricultural Imports from United Arab Emirates

Agricultural products which are the major imports of Pakistan from United Arab Emirates, included in the study were milk, sugar and dried vegetables. These agricultural products were selected for the study on the basis of import values. Being a country of agriculture, why Pakistan is importing these agricultural products from United Arab Emirates which is not directly producer of these products? That’s why there is need to explore this area and to make analysis about these products of agriculture that are being imported by Pakistan from United Arab Emirates.

4.12.1 Milk

Pakistan has strong competitiveness in milk as exhibited by the values of NPC of milk for the years 2003-2012. For the year 2004 and 2005 the competitiveness was more as shown by the NPC value that is less than the 0.20 as compared to the years 2009-2012 (NPC > 0.30). Pakistan is a larger producer of milk but due to high consumption in Pakistan milk is not being exported by Pakistan. Due to high

<table>
<thead>
<tr>
<th>Year</th>
<th>NPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>0.51</td>
</tr>
<tr>
<td>2010</td>
<td>0.65</td>
</tr>
<tr>
<td>2011</td>
<td>0.98</td>
</tr>
<tr>
<td>2012</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Source: Author's calculations
domestic demand of milk, Pakistan imports a large quantity of milk. There is only the way that Pakistan should increase its domestic production of milk.

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Protection Coefficient (NPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.21</td>
</tr>
<tr>
<td>2004</td>
<td>0.18</td>
</tr>
<tr>
<td>2005</td>
<td>0.17</td>
</tr>
<tr>
<td>2006</td>
<td>0.21</td>
</tr>
<tr>
<td>2007</td>
<td>0.23</td>
</tr>
<tr>
<td>2008</td>
<td>0.21</td>
</tr>
<tr>
<td>2009</td>
<td>0.30</td>
</tr>
<tr>
<td>2010</td>
<td>0.33</td>
</tr>
<tr>
<td>2011</td>
<td>0.32</td>
</tr>
<tr>
<td>2012</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Source: Author’s calculations

NPC values of the milk showing that Pakistan can produce milk at low cost and can export to get high margin, but due to domestic demand it is not possible. So there is need to make more growth in dairy sector and government should give more attention toward this sector

4.12.2 Sugar

Value of NPC more than one is showing that international prices were less than domestic prices and Pakistan has no competitiveness in sugar. When international prices went up in 2008, Pakistan became competitive in sugar for the market of United Arab Emirates, as shown in Table 4.12 for the years of 2008, 2009 and
2010. Again in 2012, Pakistan has competitiveness in sugar shown by the value of NPC that was 0.74. The NPC values of sugar showing that sugar was not competitive in 2003-2007 and again in 2011. So there is a problem in sugar industry because Pakistan is not competitive in sugar then why it is not importing sugar at low prices from United Arab Emirates to fulfill domestic demand at low cost.

Table 4.12: Nominal Protection Coefficient (NPC) of Sugar

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal Protection Coefficient (NPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>1.11</td>
</tr>
<tr>
<td>2004</td>
<td>1.00</td>
</tr>
<tr>
<td>2005</td>
<td>1.09</td>
</tr>
<tr>
<td>2006</td>
<td>1.08</td>
</tr>
<tr>
<td>2007</td>
<td>1.09</td>
</tr>
<tr>
<td>2008</td>
<td>0.75</td>
</tr>
<tr>
<td>2009</td>
<td>0.86</td>
</tr>
<tr>
<td>2010</td>
<td>0.98</td>
</tr>
<tr>
<td>2011</td>
<td>1.02</td>
</tr>
<tr>
<td>2012</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Source: Author’s calculations

4.12.3 Dried Vegetable

NPC values of the dried vegetables for the time duration of 2003-2012 is given in the table 4.13 that showed the NPC values remained more than unity. It is due to the fact that the domestic prices of dried vegetables were taken for the products imported into Pakistan and then circulated in the country. Pakistan is an exporter of fresh vegetables but at the same time Pakistan also importer of dried vegetables. It means there is lack of value addition in this sector of vegetables.
Table 4.13: Nominal Protection Coefficient (NPC) of Dried Vegetables

<table>
<thead>
<tr>
<th>Year</th>
<th>(NPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>1.38</td>
</tr>
<tr>
<td>2004</td>
<td>1.38</td>
</tr>
<tr>
<td>2005</td>
<td>1.37</td>
</tr>
<tr>
<td>2006</td>
<td>1.19</td>
</tr>
<tr>
<td>2007</td>
<td>1.30</td>
</tr>
<tr>
<td>2008</td>
<td>1.25</td>
</tr>
<tr>
<td>2009</td>
<td>1.18</td>
</tr>
<tr>
<td>2010</td>
<td>1.33</td>
</tr>
<tr>
<td>2011</td>
<td>1.35</td>
</tr>
<tr>
<td>2012</td>
<td>1.49</td>
</tr>
</tbody>
</table>

Source: Author’s calculations

There is need of value addition in this sector, as there is demand of dried vegetables in Pakistan but there is lack of supply or production of dried vegetable in Pakistan to fulfill its demand. These dried vegetables are being imported by Pakistan and domestic consumers pay more for these products. Pakistan can produce these dried vegetables by its own, but unfortunately there is lack of interest of food technologists and special planning in this sector. There is also lack of adoption of value addition in this sector.
Figure 4.16: NPC of Major Agricultural Products Traded between Pakistan and United Arab Emirates
Comparative Advantage of Major Agricultural Exports

4.13 Comparative Advantage of Major Agricultural Exports

The study under consideration however also use the revealed comparative advantage (RCA) and revealed systematic comparative advantage (RSCA) measures in assessing the performance of major agricultural export products from Pakistan. Revealed comparative advantage calculates the ratio of a country’s export share of a commodity in the international market to the country’s export share of all other commodities. An increasing RCA index reflects increasing comparative advantage. An RCA index greater than 1 reveals higher competitiveness (Latruffe, 2010). It is noted that the RCA helps in measuring trade flows among countries/regions based on differences in cost advantage and the likely effect of trade policy measures on trade flows. The RCA measure according to Nwachuku et al. (2010) could be made symmetric by obtaining an index called “Revealed Symmetric Comparative Advantage (RSCA)”. It varies from -1 to +1. The closer the value is to +1, the higher the competitiveness of a country in the commodity of interest. Shah et al (2009) examined competitiveness of selected Pakistani fruits with major global fruit exporters by using Balassa RCA indices for a period from 1995-2005.

On the basis of values of previous 10 years, three major agricultural products were selected which are being exported to United Arab Emirates. These agricultural products are basmati rice, meat (mutton and beef) and cotton yarn. Analyses of these three major agricultural export products are done to check out the competitiveness and comparative advantage. The revealed comparative advantage approach is one of the few methodologies to measure a country’s intensity of comparative advantage and disadvantage in a particular industry.

4.13.1 Exports of Rice

Rice is a major agricultural export facing increasing pressure from Thailand and Vietnam, requiring restructure of macroeconomic policies at the level of cultivation, processing and marketing. The use of approaches of revealed comparative advantage (RCA) and revealed systematic comparative advantages
(RSCA), for the period of 2003-2012, indicated that rice has a strong comparative advantage reflecting heavy potential for export growth in global market as presented in Table 4.14. In 2003 the RCA index was about 54, showed increasing trend as same as by Hasan (2013) described that in 2001 RCA index was more than 47. In 2005 the RCA index is estimated more than 70. There was increasing trend in RCA till 2010. And in 2010 the results were the same as discussed by Hasan (2012), but after 2010 there was decrease in the RCA index. In 2011 RCA was greater than 61 and in 2012 the RCA index was about 62. RCA index in five years from 2005 to 2010 was greater than the RCA of 2011 and 2012. The values of RSCA close to 1 also showed that for whole the time under the study, Pakistani rice has comparative advantage. The reason of this decrease in RCA in 2001 and 2012 was, the less exports of rice from Pakistan due to high domestic prices in the country.

**Table 4.14: Revealed Comparative Advantages of Pakistani Rice**

<table>
<thead>
<tr>
<th>Year</th>
<th>RCA</th>
<th>RSCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>54.58</td>
<td>0.96</td>
</tr>
<tr>
<td>2004</td>
<td>53.24</td>
<td>0.96</td>
</tr>
<tr>
<td>2005</td>
<td>70.55</td>
<td>0.97</td>
</tr>
<tr>
<td>2006</td>
<td>77.61</td>
<td>0.97</td>
</tr>
<tr>
<td>2007</td>
<td>67.45</td>
<td>0.97</td>
</tr>
<tr>
<td>2008</td>
<td>90.91</td>
<td>0.97</td>
</tr>
<tr>
<td>2009</td>
<td>66.93</td>
<td>0.97</td>
</tr>
<tr>
<td>2010</td>
<td>79.13</td>
<td>0.97</td>
</tr>
<tr>
<td>2011</td>
<td>61.40</td>
<td>0.96</td>
</tr>
<tr>
<td>2012</td>
<td>62.04</td>
<td>0.96</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations*

As shown in Table 4.15 Pakistani broken rice has more RCA index as compared to the overall rice exports from Pakistan. The values of RSCA close to
1 also showing that for all the time under the study Pakistani broken rice has comparative advantage as compared to the other varieties of rice because broken rice are mostly basmati rice. Broken rice mostly consist basmati rice which has larger comparative advantage as compared to all other varieties of rice because of more international demand for basmati rice.

<table>
<thead>
<tr>
<th>Year</th>
<th>RCA</th>
<th>RSCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>36.02</td>
<td>0.94</td>
</tr>
<tr>
<td>2007</td>
<td>31.09</td>
<td>0.93</td>
</tr>
<tr>
<td>2008</td>
<td>132.33</td>
<td>0.98</td>
</tr>
<tr>
<td>2009</td>
<td>106.37</td>
<td>0.98</td>
</tr>
<tr>
<td>2010</td>
<td>177.97</td>
<td>0.98</td>
</tr>
<tr>
<td>2011</td>
<td>141.08</td>
<td>0.98</td>
</tr>
<tr>
<td>2012</td>
<td>163.52</td>
<td>0.98</td>
</tr>
</tbody>
</table>

Source: Author’s calculations

4.13.2 Exports of Meat

There is increasing trend in RCA index of Pakistani meat. In 2003 the RCA index of Pakistani meat exports was 0.18, which was more than the value of RCA in 2002 that was .09 in 2002 according Hassan (2013). The value of RCA index was 0.89 in 2010, which was slightly different from the RCA index of 0.77 as described by Hassan (2013). According to results given in Table 4.16, RCA indices were more than 1 for the years 2011 and 2012, exhibited increasing comparative advantage of Pakistani meat, which reflected the potential. Pakistan exhibited a week position for the duration 2003 to 2010, as RCA indices were less than 1 with increasing trend. Especially, the values of years 2010 and 2012, were more than one, exhibited little comparative advantage and potential for Pakistani meat.
Table 4.16: Revealed Comparative Advantage of Pakistani Meat

<table>
<thead>
<tr>
<th>Year</th>
<th>RCA</th>
<th>RSCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.18</td>
<td>-0.69</td>
</tr>
<tr>
<td>2004</td>
<td>0.19</td>
<td>-0.68</td>
</tr>
<tr>
<td>2005</td>
<td>0.19</td>
<td>-0.68</td>
</tr>
<tr>
<td>2006</td>
<td>0.30</td>
<td>-0.53</td>
</tr>
<tr>
<td>2007</td>
<td>0.46</td>
<td>-0.36</td>
</tr>
<tr>
<td>2008</td>
<td>0.49</td>
<td>-0.34</td>
</tr>
<tr>
<td>2009</td>
<td>0.64</td>
<td>-0.21</td>
</tr>
<tr>
<td>2010</td>
<td>0.89</td>
<td>-0.05</td>
</tr>
<tr>
<td>2011</td>
<td>1.02</td>
<td>0.01</td>
</tr>
<tr>
<td>2012</td>
<td>1.32</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Source: Author’s calculations

The negative values of RSCA indices exhibited that the Pakistani meat has no comparative advantage for the time period of 2003-2010, and after that Pakistan got position of comparative advantage. It was due to the special efforts made by the government in livestock sector since previous few years and it seems to be more effective for international trade since 2010-11.

In present study, the RCA indices were estimated for exports of beef and mutton separately, for the duration of 2003 to 2012 as shown in Table 4.17. For the time under consideration mutton has comparative advantage with increasing trend. In 2003 the RCA index was 2.14 and became more than 3 after 2005. In 2009 it was less than 5 and in the next year in 2010, it was more than 6. In 2011 the RCA index value became 7.8 and in 2012 the value of RCA index was 11 that showed, Pakistan has more comparative advantage in mutton as compared to beef.

Table 4.17: Revealed Comparative Advantage of Pakistani Mutton and Beef

<table>
<thead>
<tr>
<th>Year</th>
<th>RCA of Mutton</th>
<th>RSCA of Mutton</th>
<th>RCA of Beef</th>
<th>RSCA of Beef</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>2.14</td>
<td>0.36</td>
<td>0.08</td>
<td>-0.85</td>
</tr>
<tr>
<td>2004</td>
<td>2.38</td>
<td>0.40</td>
<td>0.08</td>
<td>-0.85</td>
</tr>
<tr>
<td>2005</td>
<td>2.26</td>
<td>0.38</td>
<td>0.11</td>
<td>-0.80</td>
</tr>
</tbody>
</table>
In 2003 RCA index of Pakistani beef was 0.08 with an increasing trend. The value of RCA index of Pakistani beef was 0.86 in 2009. It was more than 1 and continued to increase and in 2012 it was 1.9. Pakistani beef has less comparative advantage as compared to mutton for throughout the period of 2003 to 2012. The positive and increasing values of RSCA of mutton throughout the time under study showed that the comparative advantage in mutton was increasing while on the other side negative values of RSCA of beef from 2003 to 2008 showed no comparative advantage and it started to improve its comparative advantage since 2009 and reached at 0.31 in 2012. The improvement was seen in both, but more in mutton as compared to beef for international trade.

4.13.3 Cotton Exports

Pakistan has a comparative advantage in overall cotton exports. Major Pakistani cotton exports include raw cotton, cotton yarn and cotton fabrics. Cotton industry of Pakistan has more competitiveness and comparative advantage, performing well to fulfill international demand of cotton and its products. The RCA index of cotton in 2003 was 36.8 and 41.8 in 2004 with an increasing trend. In 2010 the value of RCA index was 48.5 and it improved to 57.4 in 2012 as shown in Table 4.18.

<table>
<thead>
<tr>
<th>Year</th>
<th>RCA</th>
<th>CRS</th>
<th>RSCA</th>
<th>RSCA</th>
<th>Source: Author’s calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>3.27</td>
<td>0.53</td>
<td>0.25</td>
<td>-0.6</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>4.07</td>
<td>0.60</td>
<td>0.65</td>
<td>-0.21</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>4.12</td>
<td>0.60</td>
<td>0.86</td>
<td>-0.07</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>4.92</td>
<td>0.66</td>
<td>1.11</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>6.32</td>
<td>0.72</td>
<td>1.40</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>7.81</td>
<td>0.77</td>
<td>1.33</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>11.09</td>
<td>0.83</td>
<td>1.91</td>
<td>0.31</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.18: Revealed Comparative Advantage of Pakistani Cotton and Cotton Yarn

<table>
<thead>
<tr>
<th>Year</th>
<th>RCA Cotton</th>
<th>RSCA Cotton</th>
<th>RCA Cotton Yarn</th>
<th>RSCA Cotton Yarn</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>36.80</td>
<td>0.94</td>
<td>65.11</td>
<td>0.97</td>
</tr>
<tr>
<td>2004</td>
<td>41.83</td>
<td>0.95</td>
<td>73.91</td>
<td>0.97</td>
</tr>
<tr>
<td>2005</td>
<td>46.78</td>
<td>0.96</td>
<td>80.85</td>
<td>0.97</td>
</tr>
<tr>
<td>2006</td>
<td>49.87</td>
<td>0.96</td>
<td>92.98</td>
<td>0.98</td>
</tr>
<tr>
<td>2007</td>
<td>51.21</td>
<td>0.96</td>
<td>94.46</td>
<td>0.99</td>
</tr>
<tr>
<td>2008</td>
<td>54.11</td>
<td>0.96</td>
<td>81.99</td>
<td>0.97</td>
</tr>
<tr>
<td>2009</td>
<td>53.21</td>
<td>0.96</td>
<td>91.56</td>
<td>0.97</td>
</tr>
<tr>
<td>2010</td>
<td>48.59</td>
<td>0.95</td>
<td>80.84</td>
<td>0.97</td>
</tr>
<tr>
<td>2011</td>
<td>51.26</td>
<td>0.96</td>
<td>90.75</td>
<td>0.97</td>
</tr>
<tr>
<td>2012</td>
<td>57.40</td>
<td>0.97</td>
<td>104.28</td>
<td>0.98</td>
</tr>
</tbody>
</table>

Source: Author’s calculations

Pakistan has comparative advantage in exports of cotton yarn as exhibited by the values of indices of RCA and RSCA, which were estimated for the period of 2003 to 2012 as shown in the Table 4.18. In 2003 the RCA was 65.11 and in 2004 the RCA value raised to 73.91. There is slightly ups and down in the values of RCA for the time period under consideration. In 2010 the RCA was estimated at 80.84 and in 2012 and it reached at 104.2. The values of RSCA indices for all the time period of 2003-2012 were close to 1, showed great comparative advantage of Pakistan in cotton and cotton yarn.
Figure 4.17: Estimated RCA Value of Major Agricultural Products that are Exported from Pakistan
CHAPTER 5

SUMMARY

This chapter counts of two parts, one is the summary of the thesis in hand and the second part comprised of conclusion and recommendations.

5.1 Summary

Pakistan’s export value was US$ 23,624 million in fiscal year 2013-14. The imports of Pakistan amounted to about US$ 43,775 million during 2013-14. Pakistan always has a negative trade balance. Trade share of Pakistan with United Arab Emirates was about 11 percent of its total trade with an export share of 8.5 percent and import share of 12.3 percent. Major agricultural export items of Pakistan are rice, sugar, fruits, fish, fish preparations, vegetables, oilseeds, wheat, meat, cotton yarn, and raw cotton. Export value of rice was about US$ 2111 million during the fiscal year 2013-14. Pakistan’s major agricultural imports include milk, edible oil, tea, sugar, pulses, fertilizers, insecticides, raw cotton, and silk yarn. Pakistan’s major export items to United Arab Emirates include, clothing of textile fabrics, hosiery, rice, fabrics, cotton yarn, sports goods, fruits, vegetables, and footwear. Major agriculture export items of Pakistan to United Arab Emirates are rice, meat, and cotton yarn. Major imports of Pakistan from United Arab Emirates are petroleum products, precious stones, metals, plastic products, iron, steel, machinery, organic chemicals, and electrical equipment. Major Agricultural imports of Pakistan from United Arab Emirates include dried vegetables, sugar and milk. This study was aimed at analysis of the changing competitiveness and comparative advantage of these agricultural products over time and its implications for trade growth. The approach carried out analyses of major imports and exports of agricultural products of Pakistan to United Arab Emirates. No such detailed study was found for a special market that has a large share in Pakistani agricultural trade, so that the present study was planned to analyze the impact of major variables on trade and to make analysis of competitiveness and comparative advantages of major agricultural products traded between Pakistan and United Arab Emirates.
To determine the impacts of different variables on agricultural trade of Pakistan with United Arab Emirates as a major trading partner, the proxy of total volume of bilateral trade was used as a dependent variable in the model because time series data of bilateral agricultural trade were not available. Panel data of bilateral trade was taken in US$ million for time period of 1975 – 2012. Panel data of GDP of Pakistan and GDP of major trading partners, were taken in US$ Billion for time duration of 1975 – 2012. Panel data of GDP of United Arab Emirates as major trading partners of Pakistan were taken from the World Bank for time duration of 1975-2012. Data of about Population of Pakistan were found from the statistical year book of Pakistan. Data about population of major trading partners of Pakistan were taken from the World Bank. A dummy variable of joint border of both the trading partners was taken for analysis to check the impact of joint border in bilateral trade. Another dummy variable of cultural similarities was used for trade analysis between the trading partners. The value of dummy variable was taken one for those trading partners which have same culture as Pakistan and the value of zero was taken for those trading partners that have entirely different culture as compared to Pakistan.

United Arab Emirates is 1st leading importer of Pakistani basmati rice. The export value of Pakistani basmati to United Arab Emirates was about US$ 146 million during 201213, constituting about 23 percent of total basmati rice exports, leaving 77 percent for rest of the world. Total exports of basmati rice were at its highest point in 2008, with a value of US$ 1115 million. This unexpected upsurge in exports of basmati was due to general rise in international prices in 2007 and 2008. Other than basmati rice, 3.72 percent of other varieties of coarse rice were also exported to United Arab Emirates in 20121-13. Only 1.31 percent export of broken rice out of its total exports went to United Arab Emirates in 2012-13. Pakistan’s 2nd largest market of basmati rice is Oman, with a share of 11 percent of its basmati exports; followed by Saudi Arabia which is recipient of about 9 percent of total Pakistani basmati exports.

Second major agricultural export product from Pakistan to United Arab Emirates is meat, containing a major part of fresh and chilled meat of bovine animals which is 41.26 percent of its total exports. The export share of frozen meat of bovine animals to United Arab Emirates, was about 8.5 percent of its total export value. Also, about 12 percent exports of
meat of sheep and goat were made from Pakistan to United Arab Emirates during year 2012-13. United Arab Emirates is major market of Pakistani beef. Beef with a value of about US$ 40 million exported to United Arab Emirates in 2012-13, constituting a share of about 41 percent of its total exports from Pakistan. Total beef exports from Pakistan to the world were about US$ 97 million in 2012-13. Export value of Pakistani mutton to United Arab Emirates was about US$ 10 million in 2012-13 which was less than export value of beef from Pakistan to United Arab Emirates. Total export value of mutton form Pakistan was about US$ 86 million that was less than the total export value beef from Pakistan, during 2012-13. In 2007 about 30 percent mutton exports were made with United Arab Emirates while in 2012 this export share declined to 12 percent. Saudi Arabia is top market for Pakistani mutton having a major share of about 37 percent of its total mutton exports. Iran is 2nd largest importer of Pakistani mutton with a value of about US$ 25 Million in 2012-13. United Arab Emirates is third import market of Pakistani mutton with a value of about US$ 10 million, during 201213. Fourth and fifth markets of Pakistani mutton are Bahrain and Oman with a value of about US$ 9 million and US$ 4 million, respectively.

Cotton yarn is also a major export item of Pakistan but its export share to United Arab Emirates is less as compared to other markets. Its export share to United Arab Emirates was only about 2.3 percent. Cotton industry of Pakistan is a major source of cotton exports therefore cotton products have a major share in total exports of Pakistan. Export value of cotton related items from Pakistan to United Arab Emirates was US$ 39 million in 2012. Ten year trend lines of Pakistani exports revealed that the value of exports of cotton related items were declining over time. Major market of Pakistani cotton was china with a value of about US$ 1833 million in 2012, constituting 35 percent share in total cotton exports from Pakistan. Bangladesh is 2nd largest market of Pakistani cotton with a value of about US$ 579 million in 2012. Hong Kong is 3rd largest market of Pakistani cotton with value of about US$ 229 million. Pakistan exported cotton to Turkey, Italy and Korea with a value of about US$ 185 million, US$ 150 million and US$ 144 million, respectively in 2012. Total export value of cotton yarn from Pakistan was about US$ 2102 million in 2012 and about 67 percent of this value was exported to China. Hong Kong was 2nd largest market of Pakistani cotton yarn with a value of about US$ 191 million in 2012. Bangladesh was 3rd largest importer of

Sugar imports from United Arab Emirates amounted to US$ 1,179 thousand against total sugar imports of US$ 6,627 thousand in 2012 constituting 17.7 percent of total sugar imports. During previous last 10 years sugar imports from United Arab Emirates was very high in the years 2006, 2009, and 2010 with a value of about US$ 160 million, US$ 141 million and US$ 200 million, respectively. In 2008 about 52 percent of sugar of its total sugar imports was imported from United Arab Emirates and about 75 percent of imports of sugar were made from United Arab Emirates in 2009. The share of total imports of sugar from United Arab Emirates was low after 2009 that was about 25 percent in 2010, 18 percent in 2011 and 17 percent in 2012. Pakistan could not import sugar in 2007 and 2008, when international prices went up. Due to domestic production, domestic demand and forecasted domestic consumption, there were great fluctuations in the value of sugar imports by Pakistan in previous years.

Total Value of milk and cream imports of Pakistan was US$ 102 million in 2012-13 whereas, in 2003, it was only about US$ 7 million. In 2003 the value of imports of milk and cream from United Arab Emirates was only 61 thousands that stretched to US$ 143 thousands in 2005. It decreased to US$ 32 thousands only in 2009 and again it started to increase, showing the value of US$ 360 thousands in 2010, 739 thousand in 2011, and 823 thousands in 2012. Total import value of dried vegetables of Pakistan was US$ 407 million in 2012-13. The value of Imports of dried vegetables from United Arab Emirates was US$ 1,349 thousand in 2012. Previous ten year’s trend line of import flow of dried vegetable from United Arab Emirates to Pakistan, exhibited an increasing trend. Reduction in the import value of dried vegetable in 2007 and 2008, was due to increase in international prices. According to 2012 estimation Pakistan imported dried vegetables with value of US$ 126 million from Australia, about US$ 45 million from Myanmar, and about US$ 44 million from India. Australia is largest supplier of dried vegetables to Pakistan.

Panel data about the different variables were used in the study under consideration for the duration of 1975-2012. Test statistics of four methods used (Levin Lin & Chu, I P Shin W-stat, ADF - Fisher Chi-square and PP - Fisher Chi-square) for GDPi at level form are not
significant, indicated the data as non-stationary at level form. After transferring the data of GDPi in first difference form the test statistics of all the four methods became significant, indicated that the data of GDPi after first difference, turned to stationary. Test statistics of the four methods used for GDPj at level form are not significant, indicated that the data was non stationary at level form. After transferring the data of GDPj in first difference form the test statistics of all the four methods became significant, indicated that the data of GDPj after first difference, became stationary. The value of four tests for the data about POPi and POPj are significant at level form, indicated that the data was stationary at level form.

Gravity model of trade in Double log form with 1st differences was used to find the impact of various factors on trade between Pakistan and United Arab Emirates. The descriptive statistics of different variables was used in the study related to Pakistan and its ten major trading partners including United Arab Emirates. The data of descriptive summary presented that mean value of GDP of Pakistan was US$ 70.19 billion and the average mean value of GDP of trading partners of Pakistan was US$ 1517.69 billion. It showed that the major trade of Pakistan is generally directed toward the large economies. The mean value of population of Pakistan is 123.04 million, which is 140 million less as compared to its major trading partners. Mean value of distance between Pakistan and its major trading partners is 3967.9 km. The nearest trading partner is situated 686 km away from Pakistan and maximum distance of trading partner is 10866 km.

Hausman specification test was used to check whether fixed effect or random effect model was appropriate. F-test was used to choose best model between the fixed effects or Pooled OLS. Breusch-Pagan LM test was used for selection of appropriate model between Pooled OLS and random effect model. For time invariant variables between Pooled OLS and random effect model, most appropriate model for the analysis was known by Bruesch-Pagan lagrang multiplier test. Significant value of Breusch-Pagan LM test concluded that random effects model was appropriate instead of Pooled OLS. As a final point, after application of Hausman specification test, F-test and Breusch-Pagan LM test, it was concluded that two models were appropriate i.e., fixed effects model for time variant variables and random effects model for time invariant variables.
By using F-test and Housman specification test, fixed effect model was considered best model for checking the impact of time variant variables on bilateral trade of Pakistan with its trading partners. According to the results of fixed effect model, GDP of Pakistan was positively affecting agricultural trade between Pakistan and its trading partners. The coefficient of GDP of Pakistan was 0.75, which was highly significant. One percent increase in GDP of Pakistan would increase 0.75 percent agricultural trade between Pakistan and United Arab Emirates. The value of estimated coefficient of GDP of trading partners of Pakistan was 0.69 and found significant, explaining that one percent increase in GDP of trading partners of Pakistan cause an increases of 0.69 percent in bilateral agricultural trade of Pakistan with its trading partner. It means that with one percent increase in GDP of United Arab Emirates would increase 0.69 percent in agricultural trade of Pakistan with United Arab Emirates.

Population of Pakistan was negatively affecting agricultural trade of Pakistan with its trading partners. Estimated value of coefficient of population of Pakistan was -1.24 by the fixed effect model, which was highly significant and it indicated that one percent increase in population of Pakistan would decrease 1.24 percent agricultural trade of Pakistan with United Arab Emirates. The population of Pakistan carried negative sign. It implies that population variable had the trade inhibiting affect. It implies that a larger population size may be treated as large resource endowments and thus an indication of self-sufficiency and thereby less reliance on international trade. Population of trading partners of Pakistan positively affected agricultural trade of Pakistan with its major trading partners. This impact was highly significant and according to results a percent increase in population of trading partners of Pakistan caused an increase of 0.63 percent in agricultural trade between Pakistan and its trading partners. In the model of fixed effects constant value of trade was 2.92 percent when making an analysis of trade of Pakistan with its major trading partners but when trade was considered only with United Arab Emirates, constant value of trade between Pakistan and United Arab Emirates was 6.51. In the analysis, all values of VIF were less than 10, which showed no multicollinearity existed in the data set. To solve the problem of heteroscedasticity, HAC standard errors were used during estimation of the results.
All variables in the model of random effects have no problem of multicolinearity because the values of variance inflation factor were less than ten. To solve the problem of heteroscedasticity HAC standard errors were used during estimation of the results by random effects model. GDP of Pakistan was significantly affecting agricultural trade between Pakistan and its trading partners. It means that one percent increase in GDP of Pakistan would increase about one percent agricultural trade with United Arab. GDP of trading partners of Pakistan significant and positively affecting agricultural trade. One percent increase in GDP of United Arab Emirates would increase 0.51 percent agricultural trade with United Arab Emirates. Population of Pakistan has a negative effect on bilateral agricultural trade of Pakistan that was not significant. According to estimated results of random effects, one percent increase in population of Pakistan would decrease 1.13 percent agricultural trade between Pakistan and United Arab Emirates. Population of major trading partner of Pakistan has a positive effect on agricultural trade. This impact was highly significant which states that one percent increase in population of United Arab Emirates would increase about 0.23 percent agricultural trade between Pakistan and United Arab Emirates.

According to the estimation of random effect model, distance was negatively affecting bilateral trade. It shows that, an increase in distance between trading partners has a negative effect on trade but this impact was not significant. Cultural similarities between trading partners has a positive impact on mutual agricultural trade, which was highly significant relationship. The similar culture of Pakistan with its major trading partners have 1.27 percent more trade as compared to the trading partners which have no cultural similarities with Pakistan. Joint border was assumed to have a positive impact on bilateral trade but in case of Pakistani trade the fact was that Pakistan have not good relations with the countries which have joint border with Pakistan, that’s why this impact was negative and highly significant as shown by the estimation of random effect model. The joint border countries of Pakistan have 2.3 percent less trade as compared to the countries which has no joint border. According to the random effects model, constant value of trade with its major top ten trading partners was 5.53 percent. But considering trade of Pakistan with United Arab Emirates, constant value becomes 6.15 percent of trade value.
The NPC values of basmati rice was 0.57 in 2003, which was less competitive as compared to 2004 and 2005. Throughout time period under consideration, basmati remained more competitive in 2007, value of its NPC was 0.26. In 2008 NPC value became 0.38 which exhibited more competitiveness in 2007 as compared to 2008. Afterwards, in 2009, NPC value was 0.37 in 2009 and 0.36 in 2010 that was again getting competitiveness in basmati rice but unfortunately the value of NPC in year of 2011 became 0.89 that showed that basmati rice was losing its competitiveness. The value of NPC in 2012 was 0.91 which is showing that Pakistan have little competitiveness in basmati exports. Basmati rice of Pakistan has competitiveness in international markets whereas before a decade it had more competitiveness. Throughout periods under consideration, basmati was less competitive in 2012, the value of NPC was 0.91. It was due to reason that Pakistani basmati exports were suffering problems and exporters worried about that situation when domestic prices increased but there was no increase in international prices of basmati, hence Pakistan was not performing well as compared to its other competitors especially India. Because United Arab Emirates exports basmati at high prices in international markets so that’s why Pakistan is losing its competitiveness in United Arab Emirates. Pakistan should try to search other markets to sell its basmati where prices are more as compared to United Arab Emirates. Pakistan should not concentrate on only the market of United Arab Emirates, because throughout time under consideration NPC value showed that basmati is losing its competitiveness in United Arab Emirates.

Rice is a major agricultural export facing increasing pressure from Thailand and Vietnam, requiring restructure of macroeconomic policies at the level of cultivation, processing and marketing. The use of approaches of revealed comparative advantage (RCA) and revealed systematic comparative advantages (RSCA), for period of 2003-2012, indicated that rice has a strong comparative advantage reflecting heavy potential for export growth in global market. In 2005 RCA index was estimated more than 70. There was increasing trend in RCA till 2010. In 2011 RCA was greater than 61 and in 2012 RCA index was about 62. RCA index in five years from 2005 to 2010 was greater than RCA of 2011 and 2012. The values of RSCA close to 1 also showed that for whole the time under the study, Pakistani rice has
comparative advantage. The reason of this decrease in RCA in 2001 and 2012 was, the less exports of rice from Pakistan due to high domestic prices in the country. Pakistani broken rice has more RCA index as compared to the overall rice exports from Pakistan. The values of RSCA close to 1 also showing that for all the time under the study Pakistani broken rice has comparative advantage as compared to other varieties of rice because broken rice are mostly basmati rice. Broken rice mostly consist basmati rice which has larger comparative advantage as compared to all other varieties of rice because of more international demand for basmati rice.

Pakistan has competitiveness in both beef and mutton for the time under consideration for 2003-2012. In 2003 NPC of Pakistani beef was 0.56 that was showing more competitiveness as compared to the years of 2004, 2005 and 2006. Again in 2008, NPC value decreased to 0.51 showing more competitiveness. NPC of beef of Pakistan remained less as compared to mutton showing that Pakistani Beef is more competitive as compared to mutton. The comparison of both NPCs of mutton and beef for the period of 2003-2012, indicated that Pakistani beef is more competitive as compared to mutton because its NPC value was less than mutton. Pakistan should try to focus more on beef as compared to mutton because NPC values shows that Pakistani beef is more competitive as compared to mutton. For mutton Pakistan should try to find other markets of the world where NPC values are less as compared to United Arab Emirates.

There is increasing trend in RCA index of Pakistani meat. In 2003, RCA index of Pakistani meat exports was 0.18. RCA indices were more than 1 for the years 2011 and 2012, exhibited the increasing comparative advantage of Pakistani meat, which reflected the potential. Pakistan exhibited a week position for the duration 2003 to 2010, as RCA indices were less than 1 with increasing trend. Especially, the values of years 2010 and 2012, were more than one, exhibited little comparative advantage and potential for Pakistani meat. The negative values of RSCA indices exhibited that Pakistani meat has no comparative advantage for the time period of 2003-2010, and after that Pakistan got position of comparative advantage. It was due to special efforts made by the government in livestock sector since previous few years and it seem to be more effective for international trade since 2010-11. For the time under consideration mutton has comparative advantage with increasing trend. In 2003 RCA
index was 2.14 and became more than 3 after 2005. In 2009 it was less than 5 and in the next year in 2010, it was more than 6. In 2011, RCA index value became 7.8 and in 2012, value of RCA index was 11 that showed, Pakistan has more comparative advantage in mutton as compared to beef. In 2003 RCA index of Pakistani beef was 0.08 with an increasing trend. The value of RCA index of Pakistani beef was 0.86 in 2009. It was more than 1 and continued to increase and in 2012 it was 1.9. Pakistani beef has less comparative advantage as compared to mutton for throughout the period of 2003 to 2012. The positive and increasing values of RSCA of mutton throughout the time under the study showed that the comparative advantage in mutton was increasing while on the other side negative values of RSCA of beef from 2003 to 2008 showed no comparative advantage and it started to improve its comparative advantage since 2009 and reached at 0.31 in 2012. The improvement was seen in both, but more in mutton as compared to beef for international trade.

Throughout the duration under study for the period of 2003-2012, Pakistan has competitiveness in cotton yarn. Pakistan has value of NPC less than 0.5 for the year 2008, while for all other years under the study the values of NPC were more than 0.5. For the year 2011 and 2012, NPC values were 0.98 and 0.90, respectively, showing less competitiveness. It means Pakistan has competitiveness in the cotton yarn but it is not strong competitiveness which indicated presence of potential in this sector. Pakistani cotton industry is emerging with time since the exports of value added products of cotton has been increasing and more profitable as compared to of exports raw products. Since 2011 Pakistan is not performing well in exports of cotton yarn to United Arab Emirates, which is shown by estimated values of NPC indices. There is need to shift toward the value addition in this sector. If Pakistan lose its competitiveness in cotton yarn than it should no need to worry about it and should try to find other markets where it can enjoy its competitiveness. Pakistan has a comparative advantage in overall cotton exports. Major Pakistani cotton exports include raw cotton, cotton yarn and cotton fabrics. Cotton industry of Pakistan has more competitiveness and comparative advantage, performing well to fulfill international demand of cotton and its products. The RCA index of cotton in 2003 was 36.8 and 41.8 in 2004 with an increasing trend. In 2010, value of RCA index was 48.5 and it improved to 57.4 in 2012. Pakistan has
comparative advantage in exports of cotton yarn as exhibited by the values of indices of RCA and RSCA, which were estimated for the time period of 2003 to 2012. In 2003, RCA was 65.11 and in 2004, RCA value raised to 73.91. There is slightly ups and down in the values of RCA for the time period under consideration. In 2010, RCA was estimated at 80.84 and in 2012 and it reached at 104.2. The values of RSCA indices for all the time period of 2003-2012 were close to 1, showed great comparative advantage of Pakistan in cotton and cotton yarn.

Pakistan has strong competitiveness in milk as exhibited by the values of NPC of milk for the years 2003-2012. For the year 2004 and 2005, competitiveness was more as shown by the NPC value that is less than 0.20 as compared to the years 2009-2012 (NPC > 0.30). Pakistan is a larger producer of milk but due to high consumption in Pakistan milk is not being exported by Pakistan. Due to high domestic demand of milk, Pakistan imports a large quantity of milk. There is only the way that Pakistan should increase its domestic production of milk. NPC values of milk showing that Pakistan can produce milk at low cost and can export to get high margin, but due to domestic demand it is not possible. So there is need to make more growth in dairy sector and government should give more attention toward this sector.

Value of NPC more than one is showing that international prices were less than the domestic prices and Pakistan has no competitiveness in sugar. When international prices went up in 2008, Pakistan became competitive in sugar for market of United Arab Emirates, for the years of 2008, 2009 and 2010. Again in 2012, Pakistan has competitiveness in sugar shown by the value of NPC that was 0.74. The NPC values of sugar showing that sugar was not competitive in 2003-2007 and again in 2011. So there is a problem in sugar industry because Pakistan is not competitive in sugar than why not importing sugar at low cost from United Arab Emirates market for fulfilling domestic demand at low prices.

NPC values for the time duration of 2003-2012, that presented the NPC values for dried vegetables remained more than unity. It is due to the fact that the domestic prices of dried vegetables were taken for the products which were imported into Pakistan and then circulated in the country. Pakistan is an exporter of fresh vegetables but at the same time also an importer of dried vegetables. It means there is lack of value addition in this sector of
vegetables. There is need of value addition in this sector, as there is demand of dried vegetables in Pakistan but there is lack of supply or production of dried vegetable in Pakistan to fulfill its demand. These dried vegetables are being imported by Pakistan and domestic consumers pay more for these products. Pakistan can produce these dried vegetables by its own, but unfortunately there is lack of interest of food technologists and special planning in this sector. There is also lack of adoption of value addition in this sector.

5.2 Conclusions and Recommendations

GDP of Pakistan has a positive and significant impact on agricultural trade with United Arab Emirates. Pakistan need to find large economies for trade of agricultural products. GDP of United Arab Emirates has a positive and significant impact on agricultural trade between Pakistan and United Arab Emirates. Population of United Arab Emirates has positive Impact on agricultural trade. It is recommended that Pakistan should try to focus more on economies having large population as a trading partner for agricultural products. Negative impact of Increasing Population of Pakistan on agricultural trade suggests that Pakistan should try to improve labor qualities and skills that may be favorable in agricultural trade growth as well as development of economy. The negative impact of Distance and joint border between trading partners, on agricultural trade suggest that Pakistan should try to improve trade environment with the countries that are close to Pakistan and also with its neighbors. After the Positive and significant impact of cultural similarities on agricultural trade, it is recommended that Pakistan should try to concentrate on that countries whose culture is similar with Pakistani culture, i.e. Saudi Arabia, India and Iran.

Pakistan has a comparative advantage in production of basmati rice because the it is very popular all over the world and Pakistani land has the ability to grow basmati rice with aroma smell that’s why the export values of basmati rice from Pakistan is more as compared to the other agricultural crops. United Arab Emirates is major market of Pakistani rice and since 2008, exports of basmati rice were decreasing. In 2007 NPC value of basmati rice was 0.26 and in 2008 NPC value became 0.38 which shows more competitiveness in 2007 as compared to the 2008. After that in 2009 NPC value was 0.37 and NPC value of 0.36 in 2010 that was showing again getting competitiveness in basmati rice but unfortunately the
value of NPC in the year of 2011 became 0.89 that showed that the basmati rice was losing its competitiveness. And the value of NPC in 2012 was 0.91 which was showing that Pakistan have little competitiveness in basmati exports. Values of NPC indices shows that Pakistan is losing its competitiveness in United Arab Emirates. So Pakistan should find more markets to reduce its dependence on United Arab Emirates for basmati, because the major share of basmati is only going to this markets. United Arab Emirates is a market acting as an intermediate channel that re-exports these products to the other markets of the world. So Pakistan should try to find other markets where the NPC values should be less as compared to United Arab Emirates. Decrease in the Competitiveness of Pakistani basmati as compared to its main competitors is due to the main cause of increase in domestic prices of basmati rice in Pakistan. Increasing inflation is the main cause of this increase in basmati rice. There is need of involvement of government strong price polices to control the increase in domestic prices of basmati to make basmati rice again more competitive in world market. Basmati growers should be given proper subsidies and the policies should be made to keep the prices of basmati low to make Pakistani basmati rice more competitive in international markets as compared to its main competitors. In the study RCA index of Pakistani rice including all varieties was 90.91 in 2008 and 62.02 in 2012 shows that Pakistani rice is also losing its comparative advantage since 2008. Broken rice exports from Pakistan that consists of basmati rice has a RCA value of 132 in 2008 and 163 in 2012 is showing an increase in the comparative advantage for basmati rice. Increasing values of RCA indices of basmati rice shows that Instead of losing competitiveness of basmati rice in the world markets Pakistan still have comparative advantage in basmati rice so there is need to maintain both the competitiveness and comparative advantage at the same time and for this government should play its role by changing the existing price policies.

By reviewing the trends of meat exports for 10 years from Pakistan, it was seen that value of beef was more than mutton. The value of beef exported to United Arab Emirates, was also more than mutton. It means that the demand of beef is more in United Arab Emirates as compared mutton. It does not mean that Pakistan should concentrate more on beef to increase export value to United Arab Emirates. That’s why the analysis of NPC was necessary to know the sector to which more emphasis is needed. For this purpose, NPC
analysis for previous 10 years expressed that NPC of Pakistani beef remained less as compared to mutton, indicating more competitiveness of Pakistani beef as compared to mutton. It is concluded that Pakistan should focus more on beef for its exports growth as compared to mutton. Pakistan should focus more on beef for the market of United Arab Emirates while in case of mutton it should try to find the other markets, with the less values of NPC indices of mutton, as compared to United Arab Emirates. The analysis of increasing trend of RCA and RSCA indices for previous 10 years, for both mutton and beef, showed that Pakistani mutton has more comparative advantage as compared to beef. Pakistani mutton is less competitive instead of having more comparative advantage, it pointed out that there are some quality issues in Pakistani mutton for international markets. After conclusion of the study about mutton and beef it is suggested and recommended that Pakistan should focus on the both mutton and beef to expand exports. At the same time a special effort is required to solve the quality issues in mutton especially as compared to beef to increase mutton exports.

Performance of Pakistan in exports of cotton yarn to United Arab Emirates, was good before 2011. Pakistan was competitive since 2011 in exports of cotton yarn to the market of United Arab Emirates. For the short period of time, Pakistan should not worry about its less competitiveness because in this sector the value addition is growing more and it is more profitable because of high demand in all over the world. Estimation of NPC indices of cotton yarn throughout duration of time under consideration, shows that Pakistan has competitiveness in cotton yarn but it is not a strong competitiveness. There is no more potential in exports of cotton yarn in this market. Pakistani cotton industry is developing more as time passes, that’s why exports of value added products of cotton is increasing and have strong competitiveness as compared to raw products of cotton. So there is need to concentrate more on value addition in this sector. After the study of estimated value of RCA of cotton yarn, it is concluded that Pakistan has comparative advantage in export of cotton yarn. There is need to have more competitiveness and comparative advantage at the same time. However the other value added product seems to be more competitive and comparative advantage as compared to cotton yarn that’s why there is no need to worry about the low
competitiveness of Pakistani cotton yarn because it is used in other products of cotton that have more competitiveness.

The estimation of NPC indices of milk for the period under consideration concludes that Pakistan can produce milk at low cost and can export to get high margin but due to domestic demand, it is not possible. Pakistan is a larger producer of milk but due to high consumption in Pakistan milk is not exported from Pakistan. Pakistan has strong competitiveness in milk but still is not able to export milk to other countries. Due to high domestic demand of milk Pakistan imports a large quantity of milk. NPC values of milk showing that Pakistan can produce milk at low cost and can export to get high margin but due to domestic demand, it is not possible. So there is need to make more growth in dairy sector and government should give more attention toward this sector.

Value of NPC of sugar more than unity was showing that international prices were less than domestic prices and Pakistan has no competitiveness in sugar. When international prices go up in 2008 Pakistan becomes competitive in sugar in international markets. There is a problem in sugar industry because Pakistan is not competitive in sugar than why not importing sugar at low cost from international market to fulfill domestic demand at low prices.

Pakistan is an exporter of fresh vegetables but at the same time Pakistan also importer of dried vegetables. It means there is lack of value addition in this sector of vegetables. There is need of value addition in the sector of vegetable as there is demand of dried vegetables in Pakistan but no supply or production of dried vegetable in Pakistan to fulfill its demand. Because these dried vegetables are imported and Pakistani consumers pay more for these products. Pakistan can produce these dried vegetables by its own but unfortunately there is lack of interest of food technologists and special planning in this sector. There is also lack of adoption of value added technologies in this sector.

5.3 Global Impact of the Study

By this research the impact of different important factors was showed which are very important for the bilateral trade between any two economies and their consideration is much essential for increasing the bilateral trade with any trading partner. It is suggested that
Pakistan should try to find large economies of the world for the trade of agricultural products. It is recommended that Pakistan should try to focus more on the economies having large population as a trading partner for agricultural products. By doing this the trade of the other nations of the world will also increase. The negative impact of Distance and joint border between trading partners, on agricultural trade suggest that Pakistan should try to improve the trade environment with the countries that are close to Pakistan and also with its neighbors. After the Positive and significant impact of cultural similarities on agricultural trade, it is recommended that Pakistan should try to concentrate on that countries also whose culture is similar with Pakistani culture. According to the findings of the study, increasing values of RCA index of basmati rice showed that Pakistan has comparative advantage in basmati Rice and 23 percent of basmati rice is being exported to the country of united Arab emirates who is not directly consuming it rather is re- exported to the other nations of the world. Other countries of the world should directly import the rice from Pakistan. Increasing trend of RCA indices for the previous 10 years of both mutton and beef is the proof of having comparative advantage. United Arab Emirates is major market of Pakistani beef constituting a share of about 41 percent to total exports from Pakistan and about 30 percent mutton exports were made with United Arab Emirates. United Arab Emirates re-exports the basmati rice, mutton and beef to the other countries of the worlds that are unable to directly import from such a country that has comparative advantage. After this study the other countries of the world would be able to know about the comparative advantages of the agricultural products of Pakistan. On the other side Pakistan is also unable to find the countries or to attract the countries who are importing these products from United Arab Emirates. Each country of the world should try to make trade on the basis of comparative advantage. It will decrease the transportation costs, transaction costs, and will be more beneficial for importers and exporters as well.

5.4 Limitations of the Study

Non availability of the related data of some important factors was a limitation of the study to make the study more comprehensive. Time constraints and non availability of funds for studies of social science was also a major constraint for conducting this research. Major agriculture export items of Pakistan to United Arab Emirates are rice, meat, and cotton yarn.
Major Agricultural imports of Pakistan from United Arab Emirates include dried vegetables, sugar and milk. There was unavailability of time series data of these particular agricultural products more than ten years. This study was aimed at analysis of the changing competitiveness and comparative advantage of these agricultural products over time and the analysis was carried out only for short time period due to the unavailability of the time series data for long time.

To determine the impacts of different variables on agricultural trade of Pakistan with United Arab Emirates as a major trading partner, the proxy of total volume of bilateral trade was used as a dependent variable in the model because time series data of bilateral agricultural trade were not available. Due to the multicolinearity some important variables were omitted from the models. The gravity model has a major problem that it cannot be used when there are observations for which total trade is equal to zero. Second, it has been argued by Santos Silva and Tenreyro (2006) that estimating the log-linearized equation by least squares (OLS) can lead to significant biases.

**5.5 Area for Future Research**

After this study of agricultural trade analysis with United Arab Emirates there is need to conduct such research on the other markets where Pakistani trade share is more. United Arab Emirates is the 2nd largest trade partner of Pakistan with a trade share of about 11 percent. After conducting the research on topic of competitiveness and comparative advantages of major agricultural products of trade with United Arab Emirates there is need to conduct such research on the comparative advantage and competitiveness of major agricultural products of trade with other countries that are high valued markets to find out the other markets from where Pakistan can get products on low prices and can sell agricultural product to get high price. The future research may be based on the other trading partners like China, Saudi Arabia, United States and the other countries of European Union. There should be separate analyses of each product of exports and imports by estimating the competitiveness and comparative advantage and finally be able to decide which product should be exported to which market and which product should be imported from which market.
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