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# Observing Impact of SAFTA on Pakistan's Economy by Using CGE Model

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**Abstract**

The aim of this paper is to quantify and analyze the relative impact of South Asian Free Trade Agreement (SAFTA) over the global economic welfare. This research analyzes the potential economic costs and benefits of Pak-India trade in exporting various consumer goods. The first scenario is when normal trading relation with India will be restored, it means that both countries will give the MFN (Most Favored Nations) status to each other. In the second scenario, the SAFTA will be operative and there will be free trade between India and Pakistan and both countries will remove all tariffs and custom duties from each others' imports. The Global trade analysis GTAP model is used to analyze the possible impact of SAFTA on Pakistan in a multi country, multi sector applied General equilibrium frame work. After employing the simplified static analysis framework, the analysis based on simulations reveals that current demand for Pakistani dates and other consumer items like leather and cotton-made garments will expand after the FTA and consumer surplus will increase. The drop in the domestic prices of dates will increase the production of many downstream industries, which will have pleasant multiplier effects on the economy of Pakistan. The government may reduce MFN tariffs on industrial dates before implementing the FTA. A key rule of multilateral trade system is that the reduction in trade barriers should be applied on a most-favored nation basis (MFN) to all WTO members. The only exception to the MFN principle built into the GATT legal framework is the provision for reciprocal free trade within customs unions and free trade areas (GATT article XXIV). The objectives of the present study are to analyze and quantify the potential economic cost and benefits of the prospective trade between India and Pakistan to consumers, producers and government of the two countries. The export of Dried dates, leather and cotton-made garments may be conducted by two scenarios, i.e. when normal trading relations between Pakistan and

India will be restored and when there will be a free trade between Pakistan and India in the presence of South Asian Free Trade Agreement (SAFTA). Following the analytical framework discussed by PO managerial (20001), we employ the simplified static analysis by using CGE model for policy implication, which reveals that Pakistan will gain benefit from Pak-India trade on SAFTA. Results based on this research reveal that on SAFTA, grounds, there will be net export benefits in Pakistan's economy.

**Keywords**: Trade liberalization, FTA, FAFTA, Welfare gain, Economy, Pakistan.

**1. Introduction**

The objective of this study is to present a quantitative assessment of trade liberalization exercises in Pakistan in terms of economic welfare, trade, and the intersectional allocation of resources. This paper begins with a review of Pakistan's economic reforms and their coverage. Section II discusses the methodology, offering a brief description of CGE Modeling including the GTAP. The experimental designs are discussed in Sections III. Apart from unilateral and regional trade liberalization, as a founding member of the WTO, Pakistan remained firmly committed to the multilateral trading system and has already established a large number of reforms in keeping with the GATT/WTO principles. However, the paper does not review the outcome of multilateral trade Liberalization. In Section IV, GTAP model simulation results are analyzed. Section V concludes.4 **Section I** Until the late 1970s, Pakistan's economic development centered on an inward-oriented development strategy based on import substitution industrialization performed mainly by state owned firms. Both tariff and non-tariff barriers were widely used to protect domestic economic activities. Trade restrictive policies were accompanied by other regulatory policies such as control on foreign exchange, finance and foreign direct investment. These restrictive economic policies had severe adverse implications on overall economic growth, in particular growth of exports. Pakistan introduced extensive economic reforms in 1971-72 becoming the first country in the South Asian region to do so. The economy was freed from the inward-oriented strategy, and adopted an outward-oriented export-led development strategy, which was followed by many East Asian countries at that time. Trade liberalization was the key element of this new policy package and it entailed reliance on tariffs, replacement of quantitative restrictions including import licensing by a revised system of tariffs as well as the relaxation of other controls on trade. In order to encourage both domestic and foreign investment, the Government offered a series of incentives, while attempting to create an environment conducive to investment. In recent years, however, the focus of Pakistan's trade policy has seemingly shifted towards regionalism, which Pakistan considers a springboard for broader trade liberalization. The rationale for regional cooperation is based on a number of factors, not all of which are necessarily economic in nature. The formation of **EU, NAFTA, MERCOSUR and ASEAN**, and the recent emergence of other regional trading blocs may have given rise to a revival of interest in regionalism in Pakistan. This also explains the country's desire to avoid marginalization as more and more countries become members of various RTAs (Baldwin, 1993). Further, an RTA facilitates the choice of a selective liberalization policy as mutually agreed by all member economies, keeping them protected from global competition. Thus, Pakistan continued to 5 promote international trade through active participation in several regional trading agreements such as South Asian Preferential Trading Agreement (SAPTA),7 India-Sri-Lanka Free Trade Agreement (ILFTA),8 Bangkok Agreement (BA)9, the Bay of Bengal Initiative for Multi sectoral Technical and Economic Cooperation (BIMST-EC) 10 comprising

Bangladesh, India, Myanmar, Pakistan and Thailand and Indian Ocean Rim Association for Regional Cooperation (IORARC). The Free Trade Agreement (FTA) between Pakistan and Pakistan (PLFTA) became operational from June 2005.12 SAFTA was the first major step in moving towards a free trade area and higher forms of regional economic integration among the member states of the South Asian Association for Regional Cooperation (SAARC). SAARC was established in 1985 by member countries consisting of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Pakistan. The population of SAARC countries accounts for one fifth of the world population and almost half of the world's poor. The original rationale for preferential trading among SAARC countries stems from the conviction that these countries needed to pursue a policy of rapid industrialization in order to overcome their economic backwardness. Both industrial and agricultural sectors of the SAARC countries need vast technological improvements to take advantage of the global market. It is also expected that regional co-operation in South Asia will become an important means of accelerating trade and investment in the region. The agreement on SAFTA was signed in Dhaka in April 1993 by the SAAC members, providing a legal framework for trade liberalization and strengthening intra-regional economic cooperation. In 1995, SAFTA had been ratified by all contracting states and in accordance with Article 22 of the agreement SAFTA became operational on 7th December 1995. SAFTA followed a positive list approach, including flexible provisions for least developed countries (LDCs). At the Ninth SAARC Summit held in Male in 1997, the Heads of Governments decided to accelerate the pace of transition of SAFTA to South Asian Free Trade Agreement (SAFTA) by the year 2001 or Consumption is also quite high during Christmas. Similarly, the fruit enjoys enormous significance on the occasion of Dial and such festivals another religion. In Europe and North America, the fruit is particularly preferred during the dark winter month. Usual sales of dates are spread to a period from October to April.

**2. Methodology**

It is widely acknowledged that applied general equilibrium (AGE) or computable general Equilibrium (CGE) modeling has become the tool of choice for analysis of a wide range of trade policy issues such as tariffs and non-tariff barriers (NTBs) in both developed and developing countries in a variety of settings. In particular, AGE modeling is useful for analyzing the welfare effect of trade policy that needs to address second-best issues, where there are significant interactions between policy measures for one sector and distortions elsewhere in the economy. Such models have two distinctive features: they incorporate a number of distinct sectors, and the behavioral equations of the model deal with the response of industries and consumers to changes in relative prices (Adams et al., 1998). This development is explained by the capability of CGE models to provide an elaborate and realistic representation of the economy, including the linkages between all agents, sectors and other economies (Brockmeier, 1996) AGE analysis also provides a valuable tool for putting things in an economy-wide perspective (Hertel, 1999). The general equilibrium framework contains all commodities, factor markets together with decision-making agents who respond to price signals and are internally consistent 7 through capturing the many important feedback effects. Therefore, conceptually, these models can explicitly capture all the economy-wide interactions and inter-sectoral linkages. Hence, these models are very useful for analyzing the changes in sectoral output, product prices, factor usage, and factor prices as well as changes in national

welfare measures consequent to changes in trade regimes. CGE evaluations typically work with theoretical models, and allow for more interaction among endogenous variables in that they can capture the numerous complex relationships between variables of policy interest in the model economy. The usefulness of a partial equilibrium approach is limited in analyzing the effect of trade policy changes, which are propagated throughout the economy. For example, the changes of tariff policy affect the consumption, production and relative prices of imports and their domestic equivalents, and ultimately, allocation of resources within the policy-changing country. Partial equilibrium approach cannot capture these market interactions and quantify in a sensible way the impact of policy changes on all affected economic agents in the economy under consideration. On the other hand, economy-wide econometric models pay less attention to economic theory and more attention to time series data and typically manage to estimate all parameters by focusing on only a few endogenous variables. Econometric evaluations can be appraised with standard statistical criteria but they do not capture the complicated interactions in product and factor markets throughout the economy.

*2.1 Limitations of the CGE Models*

Despite the importance of CGE modeling in policy analysis, a series of questions have been raised about the empirical validity of these models. The core of the critique is focused on unsound parameter selection criteria, because the choice of elasticity values critically affects the results of policy simulations generated by these models. In the calibration method, some parameters are determined on the basis of a survey of empirical literature, some chosen arbitrarily, and the remainders are set at values, which force the model to replicate the data of a chosen benchmark year (Shoven and Whalley, 1992). Most often the estimated elasticities for commodity and/or industry classifications are based on econometric studies, which are not totally consistent with the countries represented in the model or they may even be "guesstimates" when no published figures are available. Therefore these models face two trade-offs, between transparency and complexity because on one hand, to implement large complex models the researchers are forced to choose parameters using ad hoc methods and, on the other, it is hard to understand what is driving the results in such complex models (Baldwin and Venables, 1995). Hence, one key issue with these models is how robust the results are to alternative parameter values, because there is no meaningful statistical method to test the significance of the calibrated benchmark parameter values in CGE models. Another critique related to the calibration procedure of the contemporary CGE modeling focuses on the over-reliance on non-flexible functional forms (those in the Constant Elasticity of Substitution (CES) class), and a convenient separability structure on technologies that imposes influential restrictions on the model's structure. McKitrick (1998) found that the choice of functional structure strongly influences the results from a policy simulation at both the industry specific and macroeconomic levels. Despite all these criticisms, however, the CGE models have already made contributions to trade policy issues in a wide variety of settings and therefore one can argue that these criticisms are somewhat misguided. The database and numerical results of the CGE models are intended to be more than merely illustrative and provide the internal consistent framework for policy evaluation with many implications and feedback effects that are based on solid microeconomic foundations. The key behavioral parameters in these models are related to econometric work in the literature and the careful use of a systematic sensitivity analysis

approach would clearly indicate how robust the findings are with respect to the uncertainty in parameter values. An evaluation of the robustness of model results can certainly help to increase the creditability of model conclusions. As Scollay and Gilbert (2000) point out "Distortions in an economic system will generally have repercussions far beyond the sector in which those distortions occur, and where the distortions are wide-ranging, general equilibrium is perhaps the only method which is capable of capturing the relevant feedback and flow-through effects."

*2.2 The GTAP Model*

In this study, the widely used Global Trade Analysis Project (GTAP), a multi-country, multisector AGE model (Hertel, 1997) 14 has been employed to empirically assess the impact of trade liberalization reforms in Pakistan. Multi-country, economy-wide CGE models are designed to work out the relative prices of various inputs and outputs mixes of the economies of interest as well as indicating the global changes in world trade patterns. Thus, the strength of a global AGE model lies in its ability to help us understand the linkages between sectors, countries and factors on a global scale. The general equilibrium structure recognizes that all parts of the world economy hinge together in a network of direct and indirect linkages. This means that any change in any part of the system will, in principle, have repercussions throughout the entire world. As McDougall (1995) clearly points out "its characteristics are that it is economy-wide, it is multi-sectoral, and it gives a central role to the price mechanism. These characteristics differentiate it from partial equilibrium modeling (not economy-wide), macroeconomic modeling (not multi-sectoral), and input-output modeling (agents don't respond to price signals)."The GTAP model was designed for comparative–static analysis of trade policy issues in an economy-wide framework. Since the changes in trade policies and production levels in any of the regions and sectors will have impacts on other regions and sectors, even though my main focus of this study is on results for Pakistan, it is possible to incorporate the policy changes of other countries within a global CGE modeling framework. It is only through a general equilibrium evaluation that economic policies can be assessed in terms of their impacts on welfare. It is also easy to make a comparison between different trade policy options through a global CGE model. The GTAP facilitates such multi-country, economy-wide analysis. Since this study focuses on global trading relations and detailed sectoral and regional trading activities of the Pakistan economy, many of the simulations we need to consider require a global perspective. For example, in the case of membership of SAFTA, it is needed to consider the effects on Pakistan of a reduction of domestic import tariffs on other SAFTA members. I also need to assess the impact of the reduction or elimination of import tariffs on Pakistan's exports by SAFTA members on the Pakistan economy and on its sectoral distribution. Using a global model like GTAP, we can endogenously capture the effects of policy changes of other countries explicitly on Pakistan. This ensures that changes abroad in combination with Pakistan's changes are used to generate new terms of trade for Pakistan.

Figure 1 gives a graphical exposition of the GTAP model structure by focusing on the accounting relationship of all agents in the multi region open economy. There is a regional household associated with each country or composite region of the GTAP model. Firms (producers), private households, and governments are represented as economic agents in each region of the model. The regional household collects all income

that is generated in the economy. Regional income consists of *VOA (Value of Output at Agent's prices)* paid by producers for the use of endowment commodities (factor income), and the sum over all taxes net of subsidies. All taxes (*TAXES* ) levied in the economy always accrue to the regional household. In each region, a regional household allocates regional income over the three forms of final demand: private household expenditure *(PRIVEXP),* government expenditure *(GOVEXP),* and savings *(SAVE).* Thus the final demand is represented by total utility, which is derived with a simplified Cobb-Douglas utility function to aggregate total household consumption, total government spending, and total saving. This approach represents the standard aggregation of GTAP, in which each component of final demand gets a constant share of total regional income. Thus, an increase in regional income causes an equipropotional change in private expenditures, government expenditures and savings. Each region of the GTAP model has a single representative private household. The private household supplies endowment commodities to producers, and obtains factor income in return. In GTAP, endowment commodities are non-tradable goods, which include land, unskilled labour, skilled labour, capital, and natural resources. Within each region, the model distinguishes between primary factors that are perfectly mobile across productive sectors and those that are sluggish. In the standard aggregation of the GTAP database, skilled and unskilled labour and capital are treated as perfectly mobile across industries within each region, whereas natural resources and land are treated as sluggish factors of production. The responses of the supply of factors to changes in relative sectoral returns depend on the value of the transformation elasticities parameters. The household buys bundles of commodities to maximize utility, subject to its expenditure constraint. The bundles are nested *CES* combinations of domestic goods and import bundles, with the import bundles being CES aggregations of imports from each region. The elasticity of substitution between imported and domestically produced goods in this composite nest of the utility tree is assumed to be equal across uses. In GTAP, the government revenues come from household income taxes, producers' taxes, and taxes on international transactions (minus subsidies, if they exist). As can be seen from Figure 1, 12 the government spends its income on domestically produced goods-VDGA (value of domestic government purchases, evaluated at agents' prices) and imported goods - VIGA (value of expenditure on imported tradable commodities by the government). The total government expenditure on each commodity category i.e. domestically produced and imported supplies, is allocated across commodities by a Cobb-Douglas constant budget share. In GTAP, savings is derived by assuming a Cobb-Douglas utility function and is treated as a function of regional total income and price, so that all savers in the model face a common price for the savings commodity (*PSAVE*). In particular, savings enter a regional utility function, along with composite private consumption and aggregate government purchases. This reflects an implicit assumption of fixed savings rates. Savings are included as *GLOBAL Savings* in Figure 1. Thus, the regional income in excess of regional expenditure is saved and used as investments by producers. In the GTAP model, economic welfare is measured in terms of EV (equivalent variation), which indicates the reduction/increase in the external transfer, which would be equivalent in its effects to the tariff increase/decrease. Thus EV takes the old equilibrium incomes and prices, and computes the change needed to achieve new equilibrium utilities. There are two global sectors in the GTAP model for international consistency of trade and financial flows. The global transportation sector that provides the services account for the difference between fob and

cif values for a particular commodity shipped along a specific route. The global banking sector intermediates between global savings and investment. Investment in each region is financed from a global pool of savings. Each region contributes a fixed proportion of its income to the savings pool. Thus, regional savings are gathered by the global banking sector to create composite investment good *(GLOBINV)*, based on a portfolio of net regional investment *(*NETINV), and offers this to regional households in order to satisfy their savings demand (Hertel and Tsigas, 1997). Since the size of the portfolio of global investment adjusts to accommodate changes in global savings, the global closure in this model is neo-classical. Thus, when global equilibrium is reached, all firms earn zero profits (including the global transport sector), and all households are on their budget constraint, then global investment must equal global savings and Walras' Law will be satisfied. Both factor and commodity markets are assumed to be perfectly competitive in the GTAP model. The representative firm in each industry produces goods subject to constant returns to scale technology, and every sector produces a single output. In this model, firms' behavior depends largely on the assumption of separability in the production structure. It is assumed that primary factors of production and intermediate inputs are separable, and hence, there is no substitution between primary factors and intermediate goods. The overall elasticity of substitution among primary factors determines the ability of the economy to alter its output mix in response to changes in relative prices, or changes in the endowments of these factors. Thus, primary factors are assumed to substitute for one another according to the constant elasticity of substitution, while composite value added and intermediates are used in fixed proportions (Table 5 reports the elasticities of substitution in the GTAP model). Separability in production also means that the elasticity of substitution between any individual primary factor, on the one hand, and intermediate inputs on the other, is equal. The production technology in GTAP is represented by a set of nested CES and Leontief (fixed) functions. As shown in Figure .2, at the first level of the production tree, producers use a composite unit of intermediate inputs and primary factors in fixed proportions according to a Leontief function. At the second level, firms purchase composites of primary factors and composites of intermediate inputs that are obtained as combinations of domestic goods and imported bundles of the same commodity category. Domestic and imported intermediate inputs can be substituted according to a CES form. At the third level, a CES form is also assumed to capture the degree of substitutability between imports of different origin. Employing the Armington assumption, the GTAP model assumes that goods from different sources are imperfect substitutes. Thus the imported commodities are separable from domestically produced goods. Similarly, imported intermediates are also assumed to be separable from domestically produced intermediates. Accordingly, there are two sets of Armington or source substitution elasticities in the GTAP database. One of these relates to the substitution between domestic and imported composites (domestic-import substitution elasticity) - ESUBD.

The other one relates to the substitution among imports from different sources (import-import substitution elasticity) –ESUBM. In GTAP, these elasticities are defined separately for each of the representative agents within each region rather than referring to single economy-wide demand behavior. For cross-regional behavior, the model assumes that for each commodity all agents in all regions display the same substitution elasticity. In GTAP, international trade is included by the addition of a region, namely, the Rest of

the World (*ROW*). The ROW is the source of imports into the regional economy, as well as the destination for its exports. Figure-1 indicates that firms on one side get additional revenues for selling commodities to the ROW (VXMD). On the other side, the producers spend their revenues not only on primary factors and domestically produced intermediate inputs, but also on intermediate imports (*VIFA),* and an additional consumption tax on imports to the regional household, denoted as *TAXES*. Furthermore, both the government and private household have to pay additional commodity *TAXES* on imports. Thus, the ROW gets payments for selling its goods to the private household, the government, and the firms. These revenues will be spent on commodities exported from the single region to the rest of the world *(VXMD),* and on import taxes, *(MTAX),* and export taxes *(XTAX)* paid to the regional household. As can be seen from Figure 7.2, imports are traced to specific agents in the domestic economy, resulting in distinct import payments to ROW from private households *(VIPA),* government households *(VIGA),* and firms *(VIFA).* In the GTAP model, the additional value flows denoted as taxes (*TAXES)* arise due to various policy interventions. The *TAXES* flow from private household, firms and government to the *regional* household (Figure .1). Due to the policy intervention, the government pays consumption taxes on commodities it purchases, and commodity taxes on imports. In contrast to that, taxes paid by the private household cover consumption taxes, commodity taxes on imports and income tax net of subsidies. In GTAP, producers also pay taxes to the regional household. These value flows represent taxes on intermediate inputs, consumption tax on imported inputs, and production taxes net of subsidies.

*2.3 The GTAP Data Base*

The GTAP database is the database for the GTAP model of the world economy, which is publicly available. The main data source for this model is "The GTAP 4 Data Base" (McDougall et. al., 1998), which refers to the year 1995 and therefore, all of the analysis in this study was taken from this base year. The benchmark equilibrium data set serves as a description of the economy in the initial equilibrium before any policy changes have been made. The database covers the 50 sectors within each of the 45 regions. The centerpiece of the GTAP database consists of input-output (I/O) data for each region, which account for inter-sectoral linkages within regions, detailed bilateral trade, transport, and protection data that link 45 country/regional economic databases. Thus, the GTAP database is easy to adapt to appropriate sectoral and regional aggregations that allow one to focus on specific policy questions. The regional databases in the model are derived from individual country input-output (I/O) tables that provide information about the individual regional economies in the model. The bilateral trade data was primarily derived from the United Nations *COMTRADE* (Commodity Trade) database. The Economic Research Service *(ERS)* of the United States Department of Agriculture *(USDA)* supplied the missing information in the UN trade data

*2.4 The Regional and Commodity Aggregation in the Model*

Since the full GTAP database contains 45 regions and 50 commodities, it is generally necessary to aggregate regions and commodities to a higher level for reason of computational efficiency. Therefore, the database is aggregated to 10 regions and 10 commodities, which emphasizes sectors and countries of interest for this study. Accordingly, the 10 regions of the model constitute Pakistan (LKA), India (IND), Rest of South Asia (RAS), Association of South East Asian Nations (ASEAN-5), Rest of Asia

(ROA), Japan (JPN), and countries in the European Union (EU), countries in the North American Free Trade Area (NAFTA), Middle East (MIE) and Rest of the World (ROW). The regional aggregation scheme is presented in Table .6. The country aggregation is chosen to reflect Pakistan's major trading partners. Thus India and Japan separated from the rest of the world because of the growing importance of these countries as sources of imports to Pakistan. The database disaggregates data at a country level but not for all countries. Thus, country level data exist for India and Pakistan but not for the rest of the

SAARC countries. These countries (Bangladesh, Bhutan, Maldives, Nepal and Pakistan) have data as a group under "Rest of South Asia." Therefore, these countries are included as the Rest of South Asia (RAS). The East and Southeast Asian countries are aggregated into two groups as ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, and Thailand) and Rest of Asia (China, Hong Kong, Korea and Taiwan) because these two regions are also major sources for Pakistan's imports. While the member countries of the European Union (United Kingdom, Germany, Denmark, Sweden, Finland and the Rest of European Union) are aggregated as the EU, the United States, Canada and Mexico are aggregated as NAFTA. Moreover, all the countries in the Middle East included as Middle East. The EU, NAFTA and the Middle East countries are major destinations for Pakistan's exports. Similarly, the ten commodity categories in this model are intended to represent the commodities that are of major interest to the Pakistan economy. The commodity categories in the model are: Agriculture, Forestry and Fishing (AGRI); Mining and Quarrying (MINQ); Processed Food (PROF); Textiles (TEXT); Wearing Apparels (WEAP); Petroleum and Coal Products (PECP); Machinery and Equipment (MAEQ); Transport Equipment (TREQ); Other Manufactures 17 (OTHM) and Services (SERC). The commodity aggregation chosen and detailed in each of the above commodity categories are shown in Table .7.

**3. Experimental Designs**

All experiments were conducted with the standard general equilibrium closure 25 of the GTAP model. According to the standard closure of the model, prices, quantities of all non-endowment commodities and regional incomes are endogenous variables. Conversely, exogenous variables in this closure include population, the numeraire price of savings, all technological change variables, and all slack variables except the Walrasian slack variable, all policy variables, and all endowments. If the value of the *walraslack* is zero, then global savings equals global investment and the solution is consistent in a general equilibrium sense. Finally, the global bank's allocation of investment across region is flexible *(RORDELTA=1).* Thus the rate of return to investment is allowed to equalize across countries, so that savings demand can be met by investment in other countries, as well as by the country's own investment. The elasticity of the expected rate of return to investment with respect to end-of-period capital stocks *(RORFLEX)* is set at 10 (the default setting for this parameter), making the supply of new capital goods quite insensitive to the expected rate of return. As shown in Table. 8**,** trade liberalization policy analysis for Pakistan proceeds with six scenarios of alternative trade policy options. The first scenario (*Experiment-1*) was undertaken in the context of Pakistan's unilateral trade liberalization. Since the Government of Pakistan is committed to continue trade reforms with the aim of introducing a uniform tariff rate (15 percent) over the medium term (Government of Pakistan, 1995)., this experiment is based on the

assumption that Pakistan unilaterally reduces its import tariffs to 15 percent, to maintain a uniform tariff structure on a global basis. In this case, we assume that the rest of the world does not reciprocate. The second trade reform scenario (*Experiment-2)* was conducted under the regional trade liberalization policy option to examine the impact of South Asian Free Trade Agreement- SAFTA in different contexts from the perspective of Pakistan. As a member of the SAPTA, Pakistan is committed to continue major trade liberalization measures, to establish and promote free trade arrangements for strengthening inter-regional economic co-operation and the development of national economies. In this experiment, it was assumed that Pakistan and each of the SAARC member countries in the model (India and the Rest of South Asia comprising Bangladesh, Bhutan, Maldives, Nepal and Pakistan) remove their tariffs against each other, while maintaining their tariffs against the rest of the world. The third scenario (*Experiment-3*) was conducted to combine the unilateral trade liberalization policy option (15 per cent uniform tariff for the rest of the world) with the regional trade liberalization policy option (SAFTA with SAARC countries).The rationale for this scenario is that the Pakistan government envisages introducing a uniform external tariff of 15 per cent while having free trade agreement with SAARC countries under the SAFTA. In this experiment, we assume that Pakistan and each of the SAARC countries remove their tariffs against each other, but Pakistan maintains a 15 per cent uniform import tariff for the rest of the world.

**Table1: Key Economic Indicators data for SAARC countries-2005-06 (ADB)**

| Country | Mid Year Population | Population in Growth rate | GDP US$ Mn | GNP Per capita US$ | Literacy rate | Life expectancy | Crude birth rate per(000) | Crude death rate exports | Exports US$ Mn | Imports US$ |
|---|---|---|---|---|---|---|---|---|---|---|
| **Pakistan** | 148.8 | 1.92 | 93,908 | 600 | 48.7 | 63 | 36 | 36 | 13,375 | 17,954 |
| **Bhutan** | 0.8 | 2.5 | 657 | 760 | 47.0 | 63 | 35 | 9 | n.a | n.a |
| **Bangladesh** | 135.2 | 1.3 | 585,68 | 440 | 41.1 | 63 | 29 | 8 | 6,608 | 11,276 |
| **India** | 1,086.0 | 1.6 | 686,08 | 620 | 61.0 | 63 | 24 | 8 | 71,763 | 94051 |
| **Maldev** | 0.3 | 1.5 | 719 | 24,10 | 97.2 | 67 | 36 | 6 | 122 | |
| **Nepal** | 24.7 | 2.2 | 6,685 | 250 | 48.6 | 62 | 33 | 10 | 756 | 1,869 |
| **Sri Lanka** | 19.5 | 1.1 | 19,224 | 1,010 | 92.1 | 74 | 16 | 7 | 5,757 | 8000 |

**Table 2: Gross National Product of Pakistan Rs.Million**

| S.No | Sectors/Sub-sectors | 1999-00 | 2000-01 | 2001-2002 | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 |
|---|---|---|---|---|---|---|---|---|---|
| **A.** | Agricultural sector | 923609 | 945301 | 968291` | 1059316 | 1164751 | 1314234 | 1382660 | 1608522 |
| | 1.Crops<br>1.1.Major crops<br>1.2.Minor crops<br>2.Livestock<br>3.Fishries<br>4. Forestry | 467879<br>342200<br>125679<br>417120<br>15163<br>23447 | 456258<br>325579<br>130679<br>446058<br>16546<br>26439 | 449993<br>316857<br>133136<br>476310<br>16377<br>25611 | 500370117<br>370117<br>130450<br>512976<br>16625<br>29148 | 538208<br>411836<br>126372<br>578218<br>16728<br>31597 | 651774<br>497556<br>154218<br>621170<br>17490<br>23800 | 666727<br>496841<br>169886<br>678033<br>22230<br>15670 | 1608522<br>579996<br>191835<br>794987<br>243559<br>17345 |
| **B.** | Industrial Sector | 830865 | 942263 | 989349 | 1083914 | 1416986 | 1659285 | 1939160 | 2203490 |
| **A+B** | Commodity producing Sectors | 1754474 | 1887564 | 1957640 | 2143230 | 2581737 | 2973519 | 3321820 | 3812012 |
| **C** | Services Sector | 1807546 | 2035680 | 2188527 | 2390988 | 2668790 | 3149049 | 3807356 | 4414507 |
| **D** | Gross Domestic Product (GDP) | 3562020 | 3923244 | 4146167 | 4534218 | 5250527 | 6122568 | 7129176 | 8226519 |
| **E.** | Net Factor Income from Abroad | - 47956 | -54482 | 23665 | 151812 | 124478 | 134461 | 149901 | 160738 |
| **F.** | Gross National Product(GNP) | 3514064 | 3868762 | 4169832 | 4686030 | 5375005 | 6257029 | 7279077 | 8387257 |
| **\|G.** | Population in Million | 137.53 | 140.36 | 143.17 | 146.75 | 149.65 | 152.53 | 155.37 | 158.17 |
| **H.** | Per capita Income (Rs.) | 25551 | 27563 | 29125 | 31933 | 35917 | 41022 | 46850 | 53027 |

**Source. http://www.statpak.gov.pk/depts/fbs/statistics/national_accounts/table12.pdf**

**Table 3: Regional Aggregation 10 Regions of the Model**

| Aggregated Regions | GTAP Region |
|---|---|
| 1. Pakistan | Pakistan |
| 2.India (IND) | India |
| 3.Rest of South Asia | Bangladesh |
| | Bhutan |
| | Maldives |
| | Nepal |
| | Sri Lanka |
| 4. Association of South East Asian Nations ASEAN-5 | Indonesia |
| | Malaysia |
| | Philippines |
| | Singapore |
| | Thailand |
| 5.Rest of Asia | Hong Kong |
| | Korea |
| | Taiwan |
| | Chaina |
| 6.Japan (JPN) | Japan |
| 7.European Union | United Kingdom |
| | Germany |
| | Denmark |
| | Sweden |
| | Finland |
| | Rest of European Union |
| 8. North American Free Trade Area NAFTA | USA |
| | Canada |
| | Mexico |

**Table 4: Commodity Aggregation: 10 Sector Model**

| Aggregated Regions | GTAP Region |
|---|---|
| 1.Agriculture Forestry and Fisheries (AGRI) | Paddy rice (pdr)<br>Wheat (wht)<br>Cereal grains nec(gro)(v_f)<br>Vegetable, Fruits, nuts<br>Oil seed (osd)<br>Sugar cane, sugar beet (c_b)<br>Plant based fibres (pfb)<br>Crops (nec)<br>Raw milk (rmk)<br>Wool (wol)<br>Forestry (for)<br>Fisheries (fis) |
| 2. Mining and Quarrying (MING) | Coal (co)<br>Oil (ol)<br>Gas(gas)<br>Minerals (min) |
| 3. Proceed Food (PROF) | Vegetable oil(voil)<br>Dairy products (mil)<br>Sugar cane (sgr)<br>Food products nec (ofd)<br>Beverages and tobacco products (b_t) |
| 4. Textile (TEXT) | Textile (tex) |
| 5. Petroleum and Coal Products (PECP) | Petroleum and coal product (p_c) |
| 6. Services (SERC) | Electricity (ely)<br>Gas, manufacture (gdt)<br>Water (wt) |

**Table 5: Experiment-1 15% uniform Import Tariffs Estimated Welfare Trade Effect**

| Region | EV-US$Mil. | %GDP | Of QGDP | TOT | Volume of Exports | Volume of Imports | Of Export Price | Import Price | DTBAL US$mil. |
|---|---|---|---|---|---|---|---|---|---|
| **ASEAN** | 4.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.78 |
| **EU** | -88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.0 |
| **IND** | -0.76 | 0.00 | 0.,00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.6 |
| **JPN** | 12.7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18.0 |
| **PAK** | **231.87** | **1.44** | **0.84** | **1.50** | **0.76** | **1.60** | **1.08** | **0.01** | **-123.90** |
| LKA | 13.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -6.90 |
| MIE | 11.7 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | -3.89 |
| NAFTA | -33.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 29.90 |
| ROW | -45.7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 34.54 |

**Table 6: Experiment-1 15% uniform Import Tariffs. Estimated Percentage Changes in Regional Output and Trade**

| SECTORS (A) Industry Out Put | ASEAN | EU | IND | JPN | PAK | LKA | NAFTA | ROW |
|---|---|---|---|---|---|---|---|---|
| **AGRI** | -0.00 | 0.02 | 0.02 | 0.002 | **-9.0** | 0.00 | 0.01 | 0.00 |
| **MINQ** | -0.02 | 0.01 | 0.02 | 0.00 | **-8.90** | 0.00 | 0.01 | 0.00 |
| **PROF** | 0.02 | 0.01 | 0..01 | 0.02 | **-7.65** | 0.00 | 0.02 | 0.01 |
| **TEXT** | -0.06 | -0.01 | 0.00 | 0.00 | **-9.10** | 0.03 | 0.02 | 0.02 |
| **PECP** | -0.12 | -0.02 | -0.10 | 0.00 | **30.2** | -0.09 | -0.07 | 0.06 |
| **MAEQ** | 0.02 | 0.00 | 0.00 | 0.01 | **-13.90** | 0.00 | 0.00 | 0.00 |
| **OTHM** | 0.01 | 0.00 | 0.01 | 0.00 | **-5.90** | 00 | 00 | 0.00 |
| **SERC** | -0.00 | -0.00 | -.0.. | 0.00 | **0.80** | 0.00 | -0.00 | 0.00 |
| **B-Aggregate Exports** | | | | | | | | |
| **AGRI** | -0.00 | 0.02 | 0.02 | 0.002 | **-8.90** | 0.00 | 0.01 | 0.00 |
| **MINQ** | -0.02 | 0.01 | 0.02 | 0.00 | **-8.54** | 0.00 | 0.01 | 0.00 |
| **PROF** | 0.02 | 0.01 | 0..01 | 0.02 | **-17.90** | 0.00 | 0.02 | 0.01 |
| **TEXT** | -0.06 | -0.01 | 0.00 | 0.00 | **-6.78** | 0.03 | 0.02 | 0.02 |
| **PECP** | -0.12 | -0.02 | -0.10 | 0.00 | **34.20** | -0.09 | -0.07 | 0.06 |
| **MAEQ** | 0.02 | 0.00 | 0.00 | 0.01 | **13.8** | 0.00 | 0.00 | 0.00 |
| **OTHM** | 0.01 | 0.00 | 0.01 | 0.00 | **-11.75** | 00 | 00 | 0.00 |
| **SERC** | -0.00 | -0.00 | -.0.. | 0.00 | **-15.0** | 0.00 | -0.00 | 0.00 |

**Table 7: 15% Percent Uniform Percentage Changes in Regional Output and Trade.**

| SECTORS (A) Industry Out Put | ASEAN | EU | IND | JPN | PAK | LKA | NAFTA | ROW |
|---|---|---|---|---|---|---|---|---|
| **AGRI** | 0.00 | 0.00 | -.00 | 0.00 | **-9.50** | -6.90 | -0.43 | -0.04 |
| **MINQ** | -0.0 | 0.01 | 0.02 | 0.00 | **-1.90** | 0.00 | 0.01 | -0.00 |
| **PROF** | 0.02 | 0.01 | 0..01 | 0.02 | **23.60** | 0.00 | 0.02 | -001 |
| **TEXT** | -0.03 | -0.01 | 0.00 | 0.00 | **19.0** | 0.03 | 0.02 | -0.02 |
| **PECP** | -0.01 | -0.02 | -0.10 | 0.00 | **20.0** | -0.09 | -0.07 | -0.06 |
| **MAEQ** | 0.02 | 0.00 | 0.00 | 0.01 | **-6.90** | 0.00 | 0.00 | -0.00 |
| **OTHM** | 0.01 | 0.00 | 0.01 | 0.00 | **4.0** | 00 | 00 | -0.00 |
| **SERC** | -0.00 | -0.00 | -.0.. | 0.00 | **-7.90** | 0.00 | -0.00 | -0.00 |

**Table 8:** ***Combined Trade Policy SAFTA cum 15% Uniform Import Tariffs: Estimated Welfare and Trade Effects***

| Region | EV-US$Mil. Percentage Changes | %GDP | Of QGDP | TOT | Volume of Exports | Volume of Imports | Of Export Price | Import Price | DTBAL US$mil. |
|---|---|---|---|---|---|---|---|---|---|
| **ASEAN** | -134.87 | -0.02 | 0.00 | 0.03 | -0.08 | -.0.1 | 0.03 | -0.02 | 90.0 |
| **EU** | -737 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 896.0 |
| **IND** | -0.76 | 0.00 | 0.,00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -1098.00 |
| **JPN** | 12.7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 473.00 |
| **PAK** | **566.90** | **4.45** | **0.89** | **6.89** | **-0.44** | **9.8** | **7.8** | **0.29** | **-367.90** |
| LKA | -113.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 167.60 |
| MIE | -511.7 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 234.80 |
| NAFTA | -133.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 356.90 |
| ROW | -109.9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4555.23 |

**Table1 9: Sensivity Analysis Estimated Percentage Change in Pakistan's Output and Trade**

| | **15% Uniform Import Tariff** | | | **SAFTA** | | | **SAFTA cum 15% Uniform Tariff** | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Central Scenario** | **50% Increase In ESUBM** | **100% Increase In ESUBM** | **Central Scenario** | **50% Increase In ESUBM** | **100% Increase In ESUBM** | **Central Scenario** | **50% Increase In ESUBM** | **100% Increase In ESUBM** |
| **(a) Industry Output** | | | | | | | | | |
| **AGRI** | -0.98 | -1.33 | -1.89 | -3.1 | **3.88** | 5.66 | 2.45 | 3.39 | **5.66** |
| **MINQ** | -8.56 | -8.89 | -13.01 | -8.98 | **-12.40** | -18.88 | -16.93 | -23.04 | **-34.90** |
| **PROF** | 0-8.56 | -7.78 | -8.67 | -2.56 | **-3.44** | -14.36 | -18.88 | -9.45 | **-8.56** |
| **TEXT** | -6.76 | -6.67 | -7.78 | -2.56 | **-3.62** | -7.90 | -10.0 | -12.4 | **-14.8** |
| **PECP** | 1.78 | 1.78 | 2.56 | 1.08 | **-21.94** | -39.0 | 4.5 | -2.59 | **-15.80** |
| **MAEQ** | -16.97 | -23.66 | -28.6 | 4.45 | **-2.56** | 4.7 | 4.7 | -2.33 | **-13.5** |
| **TREQ** | -17.08 | -19.75 | -21.0 | 81.6 | **131.6** | 207.6 | 50.7 | 81.3 | **120.4** |

**Table 10: Sensitivity Analysis, Estimated percentage change in Pakistan's output and Trade**

**15% Uniform Import Tariff** **SAFTA** **SAFTA cum 15% Uniform Tariff**

**(b) Aggregate Exports**

| | Central Scenario | 50% Increase In ESUBM | 100% Increase In ESUBM | Central Scenario | 50% Increase In ESUBM | 100% Increase In ESUBM | Central Scenario | 50% Increase In ESUBM | 100% Increase In ESUBM |
|---|---|---|---|---|---|---|---|---|---|
| **AGRI** | -7.9 | -11.23 | -12.41 | 33.12 | -54.12 | 67.89 | 22.5 | 54.0 | 50.89 |
| **MINQ** | -8.53 | -12.34 | -14.45 | -9.89 | -17.03 | -23.54 | -18.45 | -26.56 | -45.78 |
| **PROF** | -17.45 | -23.56 | -28.97 | 8.89 | 25.27 | 71.4 | -5.78 | 2.56 | 29.63 |
| **TEXT** | -6.79 | -10.78 | -14.67 | -14.78 | 23.44 | 27.05 | 6.4 | 12.43 | 16.67 |
| **PECP** | 23.56 | 43.56 | 56.6 | -0.76 | -1.65 | -2.3 | 22.4 | 41.90 | 68.90 |
| **MAEQ** | -17.09 | -27.78 | -34.6 | -26.78 | 70.1 | 12.50 | 56.9 | 67.2 | 43.8 |
| **TREQ** | -18.9 | -27.8 | -34.7 | 65.6 | 67.9 | 78.6 | 52.6 | 71.0 | 65.0 |

**© Aggregate Imports**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **AGRI** | -7.89 | -9.8 | -6.78 | 32.7 | -49.0 | -71.0 | 20.9 | 37.9 | 58.7 |
| **MINQ** | -1.56 | -3.78 | -3.54 | 2.34 | 6.54 | 8.76 | -.0.67 | 2.89 | 6.43 |
| **PROF** | 23.6 | 27.90 | 34.5 | 41.0 | 31.0 | 19.11 | 31.8 | 40.8 | 50.89 |
| **TEXT** | 30.8 | 23.6 | 30.1 | -3.03 | -12.5 | -14.98 | 12.6 | 2.6 | 4.12 |
| **PECP** | -5.18 | -7.56 | -8.67 | 0.78 | 0.88 | 0.65 | -4.78 | 8.8 | 11.3 |
| **MAEQ** | 3.04 | 4.64 | 5.78 | 7.90 | 8.89 | 7.14 | 7.98 | 8.66 | 11.3 |
| **TREQ** | 4.69 | 5.45 | 6.00 | 12.66 | 17.10 | 23.90 | 22.0 | 16.8 | 18.04 |

*3.1 Sensitivity Analysis*

Sensitivity analysis for AGE models is critical for establishing the robustness and obtaining the acceptance of model results. Although AGE models have become important tools of analysis in the quantitative evaluation of trade policy, the solutions obtained from these models are conditional on many assumptions. Among many assumptions, one set of assumptions-the values of model parameters such as elasticities-are amenable to "sensitivity analysis." Evaluation of the robustness of the model results can also help to increase the credibility of the conclusions of the study. In the GTAP model, the substitutability among imported commodities from different sources is determined by the Armington elasticity of substitution parameter called ESUBM. According to the Armington assumption, each country has some degree of market power over its products and can influence its terms of trade because that goods from different sources are treated as imperfect 19 substitutes. Hence, to reduce Pakistan's market power, it is necessary to increase the substitutability among imports from different origins because the terms trade effects largely depend on the import-import substitution elasticities (McDougall et al., 1998). This kind of experiment could also be interpreted as a form of conditional systematic sensitivity analysis (CSSA). Under the CSSA; each parameter is separately perturbed from its central value conditional on all the other parameters remaining at their central values. The robustness of the model results is then revealed by comparison of the simulation results with the central case. Thus, three additional experiments are undertaken under the sensitivity analysis to reduced Pakistan's market power by increasing the values of ESUBM to capture the effect of possibly different adjustment capacities as a small country. Though this will affect all countries/regions' market power

in the model, it will have most effect on the small countries like Pakistan. The first experiment under the sensitivity analysis (Experiment 4) deals with the unilateral trade liberalization scenario. (15 percent uniform import tariff). The second experiment (Experiment 5) related to the regional trade liberalization (SAFTA by itself) and the third one (Experiment 6) conducted under the unilateral trade liberalization with combination of regional trade liberalization (SAFTA cum 15 percent uniform import tariff). To make these experiments manageable, two separate experiments are conducted under the Experiments 4, 5 and 6 respectively. Thus, under the first experiment, the parameter ESUBM was perturbed from its central value and then increased its value by 50 per cent in the first three scenarios-*Experiments 4-1, 5-1* and *6*-1 respectively. Under the second experiment, the value of ESUBM was doubled (100 percent increase) for the other three scenarios-*Experiments 4-2, 5-2*, and *6-2* respectively. With these six scenarios, it was assumed that all other parameters (except ESUBM) in the model remain at their central values.

## 4. Simulation Results

### *4.1 Experiment-1: Reduction of Import Tariffs to 15 percent*

The first experiment considered the Pakistan's reduction of import tariffs to 15 percent under the unilateral trade liberalization. The impact of this scenario on regional welfare and the resulting percentage changes in sectoral output and trade are reported in Table 9 and 10 respectively. Accordingly, if Pakistan (LKA) reduces its import tariffs to 15 percent unilaterally on a global basis to maintain a uniform external tariff rate, Pakistan experiences a welfare gain around US$ 20 201 million (1.53 percent of the GDP). Under this scenario, Pakistan's volume of imports rises by 3.3 percent while its volume of exports falls slightly by 0.3 percent reflecting the fact that the pressure to increase imports is stronger than the increase in demand for Pakistan's exports by unilateral liberalization. However, as a result of the composite export price increase by 1.1 percent, Pakistan experiences a small improvement in the terms-of-trade of 1.5 percent and the real GDP by 0.8 percent. The welfare gains or losses for other regions are quite varied under this simulation. However, since Pakistan is a small country, the impact of Pakistan's unilateral reduction of import tariffs to 15 percent will not affect other region's real GDP or terms-of-trade significantly. As shown in Table 9, the 15 percent uniform tariff will adversely affect most of the sectoral output in Pakistan because of the increased competition for import competing industries. As shown in panel (a) of Table 9, the most affected industry is the transport equipment (TREQ) sector (18 percent), followed by machinery and equipment (MAEQ) sector (16 percent). It is noteworthy that these sectors expand significantly under the regional liberalization scenarios, particularly under the SAFTA scenario. The textiles (TEXT) sector (8 percent), processed food (PROF) sector (8 percent), mining and quarrying (MINQ) sector (8 percent), other manufactures (OTHM) sector (5 percent), and agriculture (AGRI) sector (1 percent) also report a decrease in output. However, there is a considerable increase in the wearing apparel (WEAP) sector (21 percent) and marginal increases in both the petroleum and coal products (PECP) sectors (2 percent), and the services (SERC) sector (1 percent). Similarly, as can be seen from panel (b) of Table 9, export sales also decline considerably in almost all the sectors except petroleum products (25 percent) and wearing apparel (21 percent). The largest decline in export sales occurs in machinery and equipment (22

percent) followed by transport equipment (19 percent), processed food (16 percent) and services (15 percent). As shown in panel (c) of Table 9, Pakistan's sectoral imports expand mainly in processed food (26 21 percent), wearing apparel (20 percent), and textiles (19 percent) while imports contract mainly in agriculture (9 percent), services (7 percent) and petroleum products (5 percent) under this policy reform. Accordingly, the results suggest that a reduction of import tariffs to 15 percent will increase Sri Lanka's welfare and terms-of-trade as well. Although one might expect that the reduction of import tariffs would increase the domestic output and therefore increase export sales, this policy reform would adversely affect Pakistan's domestic output in most of the sectors because of foreign competition. A similar impact can be seen in export sales too.

*4.2 Experiment-2: South Asian Free Trade Agreement-SAFTA*

As shown in Table-10, the welfare effects of the SAFTA scenario will be quite varied across the members, although removing barriers to trade will significantly expand the volume of trade within the region. The welfare gains from regional trade liberalization are the sum of trade creation benefits (generated new trade within the area from free trade); minus the trade diversion losses (caused by replacing more efficient nonmember suppliers with less efficient preferred member countries); plus the terms-of-trade gains associated with increased market access. It appears from Table -10, that the SAFTA will generate significant benefits for both Pakistan and India, but a loss for the countries in the RAS. Pakistan's welfare gain from the SAFTA is around US$254 million (1.92 percent of the GDP) reflecting the fact that consumers will enjoy a shift of consumption from domestically produced goods to cheaper imports, and producers from cheaper imported inputs as well. Pakistan's composite export price increases by 5 percent, and in turn this leads to the terms of trade improvement by 4 percent. However, there is only a small increase in Pakistan's volume of exports (0.9 percent), but the volume of imports will increase considerably by 7.5 percent, and this will lead to only a marginal improvement of the real GDP by 0.1 percent. In this experiment, India stands to gain most from the improved market access that SAFTA promises to deliver. As shown in Table 10, the welfare gain for India is around US$ 4445 million (1.35 percent of the GDP). This will be accompanied by an improvement of the terms-of-trade by 3.6 percent. Thus, the impact of the SAFTA on India's welfare is larger given its smaller share of imports from the members of the SAFTA (Schiff, 1996). In contrast, the SAFTA will have an adverse impact on the RAS, as representatives of the other SAARC member countries because of trade diversion. The estimated welfare loss for the RAS is around US$1575 million (1.72 percent of the GDP). This situation is further aggravated by the deterioration in the terms-of-trade by 3.9 percent. Thus, the trade-diverting effects of the formation of a FTA are likely to outweigh trade creating effects for these countries, so, there may be efficiency loss which may lead to reduced welfare. Although the simulation results capture only a comparative static analysis of trade liberalization, it may suggest that this type of FTAs would promote welfare in some regions, but this could be at the expense of other regions. For example, as shown in Table 10, Japan, the largest single importing country of Pakistani goods would no doubt lose from the SAFTA by around US$799 million because of the loss of not only Pakistan's market for her exports, but also the South Asian market as well. Table 11 presents the percentage changes in sectoral output, and trade by region under the SAFTA liberalization. The percentage changes in industry output in Pakistan, as shown in panel (a) of Table 11, the performance of the transport equipment

sector is remarkable, reporting about 85 percent increase, due mainly to the advantages by the cheaper imported intermediate inputs from the SAARC region. The industry output of other manufacture (5 percent), manufacturing equipment (4 percent), and agriculture (2 percent) also increase but to a lesser extent. However, Pakistan's industry output in wearing apparels (11 percent), mining and quarrying (9 percent), textiles (93 percent) and processed food (2 percent) decline as the domestic market is opened up to more efficient overseas producers. The removal of import tariffs under the SAFTA will adversely affect India's domestic output of apparels (12 percent), mining and quarrying (2 percent), processed food (2 percent) and agriculture (0.4 percent). Only the transport equipment sector increases by 16 percent under this policy reform which is an indication of the availability of cheaper imports that are used by the sector itself as intermediate inputs following trade liberalization. In contrast, the RAS reports the increase of industry output in wearing apparel (16 percent), machinery and equipment (6 percent), petroleum product (4 percent), textiles (4 percent) and processed food (2 percent). It also experiences a significant decrease in industry output in transport equipment by 50 percent followed by a small reduction in mining and quarrying (3 percent) and agriculture (0.4 percent) due to increased competition. As can be seen from panel (b) of Table 11, there is a substantial increase in transport equipment exports by Pakistan of around 801 percent, indicating that Pakistan will benefit immensely, by exporting these items under the SAFTA, although these items are not currently important in its export basket. The export sales of agriculture (33 percent) other manufactures (16 percent), textiles (13 percent), processed food (9 percent) and manufacturing equipment (8 percent) also increase their sales as a result of induced competition, while the services sector (17 percent), wearing apparel (12 percent) and mining and quarrying (11 percent) decline under this trade liberalization. In contrast, there is a substantial increase in India's export sales in transport equipment (228 percent) followed by machinery and equipment (44 percent). The other manufactures (9 percent) and textiles (9 percent) also increase considerably while all the other sectors report decreases in export sales. The sectors that report the highest decreases are wearing apparel (27 percent), services (15 percent) and processed food (15 percent). However, the RAS reports a substantial increase in export sales in almost all the sectors because of the preferential access to the vast SAFTA market. The largest increase occurs in the transport equipment sector (448 percent) followed by machinery and equipment (103 percent), petroleum products (102 percent), mining and quarrying (72 percent), agriculture (71 percent), and other manufacture (44 percent). As shown in Table 11 (panel c), Pakistan's aggregate imports increase considerably in agriculture (32 percent), processed food (18 percent) and transport equipment (14 percent), while both the textile and apparels imports decrease slightly by 2 percent. All the other sectors report a small increase in imports under the scenario. Not surprisingly, India's aggregate imports will increase in all the sectors with the largest increase recorded for wearing apparel (75 percent), transport equipment (27 percent), agriculture (23 percent), and textiles (21 percent) and processed food (16 percent).Thus, the simulation results seem to suggest that having a FTA with SAARC countries is a wise Strategy for Pakistan, because it provides access to the vast market of the SAARC countries. Competitive suppliers in Pakistan will enjoy a greater market share and consumers will have access to variety of cheaper and better quality goods. Trade liberalization permits Pakistan to expand its export sectors at the same time that all

sectors compete more closely with a larger number of competing varieties from SAFTA countries. Productive resources would then get allocated more efficiently as compared to the pre-liberalization situation as Pakistan would specialize in the sectors where it has comparative advantage. Therefore, Pakistan will enjoy immediate benefits from the SAFTA. Although India gains the most from the SAFTA scenario, it would not be beneficial for the RAS. However, the SAFTA will generate more production and trade opportunities for the region as a whole.

*4.3 Experiment-3: SAFTA cum 15 percent Uniform External Tariff*

This experiment considered the impact of combined trade policy of unilateral cum regional trade liberalization on Pakistan's welfare and trade. As shown in Table 12, the simulation results indicate a considerable increase in welfare for Pakistan, around US$442 million (3.35 percent of the GDP) under this scenario, reflecting that both consumers and producers are able to benefit from the removal of trade barriers. Indeed, this simulation represents the highest welfare gain for Pakistan among the three trade liberalization experiments presented. Apparently, there are two trade-creation effects from this scenario. First, trade creation that results from Pakistan's own trade liberalization, and second, that which results from the regional liberalization under the SAFTA. Pakistan also experiences the highest terms-of-trade improvement of 5.2 percent under this policy reform, as the economy would be expected to gain from the increased composite exports price of 5.4 percent, relative to a small increase in the price of imports of 0.3 percent As might be expected, Pakistan's volume of imports increases significantly by 9.0 percent, but the volume of exports decreases slightly by 0.3 percent. As a result, there is only a marginal improvement in the real GDP by 0.98 percent. Not surprisingly, India, as Pakistan's major import source, would also gain considerably under this policy reform by around US$4398 million (1.34 percent of the GDP). The reported terms-oftrade improvement for India is 3.6 percent. However, this policy reform also leads to a considerable welfare loss for the RAS of approximately US$1592 million (1.74 percent of the GDP). The RAS also experiences a deterioration of the terms-of-trade by 3.9 percent. Table 13 highlights the estimated percentage changes in regional output and distribution of sales under this policy reform. Accordingly, Pakistan's domestic output in the transport equipment sector rises considerably, by 53 percent and 625 percent respectively, as a result of the easy access to cheaper raw materials from the world, and preferential access to the SAFTA market**.** Both agriculture and petroleum product exports also rise considerably, by 23 percent. However, there is a notable decrease in domestic output and export sales in mining and quarrying (16 percent and 18 percent respectively) machinery and equipment (12 percent and 13 percent respectively), and processed food (9 percent and 6 percent respectively). Pakistan's domestic output in textiles decreases by 11 percent while the exports of textiles increase by 6 percent. The export sales in services also decrease by 27 percent As shown in panel (c) of Table 13**.** Pakistan's aggregate imports increase in almost all sectors under trade liberalization, with the exception in petroleum products (4 percent) and services (3 percent). The largest increase occurs in the processed food sector (41 percent), followed by agriculture (20 percent), transport equipment (13 percent), textiles (12 percent), machinery and equipment (7 percent) and wearing apparel (7 percent). Thus, the results suggest that if Pakistan implements the SAFTA with SAARC countries, while having a 15 percent uniform external tariff for the rest of the world that will improve Pakistan's welfare and the terms-of-trade more than

any other trade policy reform that we considered. Thus, Pakistan gains from both unilateral and regional trade liberalization simultaneously under this scenario. Although this policy reform provides incentives to some domestic industries to increase their output and export sales, there are some industries that will reduce production and export sales because of the increased competition.

The GTAP model assumes constant returns to scale and perfect competition in all sectors. Instead, if we allow for increasing returns to scale and imperfect competition in some sectors of our model, we can raise significantly the estimated welfare gains of trade liberalization. As far as liberalization stimulates investment and technology provided by the enlargement of the market, the welfare effects reported in this study are underestimates of potential gains. Moreover, we have not incorporated the effects of non tariff barriers (NTBs) in our trade liberalization simulations; instead we assumed that all other distortions remain constant except tariffs. Therefore, the omission of NTBs surely leads to an underassessment of the impacts of trade reforms on efficiency and trade.

*4.4 Experiments 4, 5 and 6: Sensitivity of the Results*

As described previously, to quantify the impact of trade policy reforms on Pakistan, three additional experiments were undertaken with an increased elasticity value for the import-import substitution parameter ( Armington parameter)-ESUBM, to consider Pakistan as a small country Accordingly, under these three experiments, first, the size of the ESUBM increased by 50 percent, and then doubled the value (100 percent increase) to reduce Pakistan's market power in the world market. This would provide an opportunity to examine the sensitivity or robustness of the model predictions with respect to the change in the underlying parameters.

Table 15 presents the results of these three experiments with the central elasticity value scenarios. Thus, under the 15 percent uniform external tariff scenario (E-4), if we reduce Pakistan's market power by increasing the value of ESUBM by 50 percent (E-4.1), it would increase welfare gain around US$247 million (1.87 percent of the GDP). Similarly, doubling the value (100%) of ESUBM (E-4.2) would increase Pakistan's welfare by around US$296 million (or 2.24 percent of the GDP). In the former case, the increase in welfare from the central value is 22 percent, and in the latter case, it is approximately 47 percent. Although these changes are relatively small, it would suggest that even as a small country, Pakistan would be in a position to gain from the unilateral trade liberalization. The welfare increases for the country as the elasticities increase. However, under these two scenarios, we see a slight decline in Pakistan's terms-of-trade as elasticities increases. Moreover, under these scenarios, the impact on terms-of-trade is not much different from the central scenario case similarly, experiment 5 (E-5) deals with the SAFTA scenario. As shown in Table 15, with the increase of the value of ESUBM, both the welfare and the terms-of-trade will increase linearly from the central scenario case. Thus, the welfare gain for Pakistan under the 50 percent increase in ESUBM (E-5.1) is approximately US$340 million (2.58 percent of the GDP), whereas under the 100 percent increase scenario (E-5.2), it is around US$422 million (3.19 percent of the GDP). Thus in the former case, Pakistan's welfare will increase by 42 percent from its central value scenario, and in the latter case it will increase by 76 percent. Thus, welfare increases as elasticities increase. Thus, the gains are rather linear with both the cases reflecting the robustness of the model results. Experiment 6 (E-6)considered the

combined policy of SAFTA cum 15% uniform import tariffs scenario Thus, 50% increase of the value of ESUBM (E-6.1), would increase welfare gain around US$592 million (from US$443 million at the central scenario) or 4.4 percent of the GDP. Here, the increase in welfare from the central value is 33 percent. Similarly, doubling the value of ESUBM (E-6.2) would increase Pakistan's welfare by around US$743 million or 5.6 percent of the GDP. In this case, the increase in welfare from the central value is 67 percent. Moreover, under these two scenarios, the increase in terms-of-trade is 5.9 and 8.8 respectively. Thus the improvements in the terms of trade from the central value are 1.7 and 3.6 percent respectively. Although these welfare and terms-of-trade gains are not almost linearly related to the changes in the Armington elasticity ESUBM, the result would suggest that unilateral trade liberalization in combination with regional trade liberalization permits Pakistan to expand its export sectors at the same time that all sectors compete more closely with a larger number of competing varieties from abroad.

Table 16 highlights Pakistan's sectoral output, exports and imports under the sensitivity analysis scenarios. Accordingly, Pakistan's industry output falls significantly in all most all the sectors except for significant increases in transport equipments and wearing apparels. Pakistan's export sales also decrease considerably under all the experiments as shown in panel (b) of Table 16, except the transport equipments petroleum products and apparel sectors under E-4, transport equipments, machinery and equipment, other manufacture and textiles sectors under E-5 and transport equipments, petroleum products, other manufacture and textiles sectors under E-6. Pakistan's aggregate imports(panel(c) in Table 16)) increase considerably in all sectors except agriculture, services, petroleum products, mining and quarrying under E-4, wearing apparels, and textiles under E-5, and petroleum products and services under E-6.

*4.5 SAFTA*

A free trade area is an agreement among countries where by tariffs and non-tariff barriers for instance quotas, licensing requirements and products safety regulation are abolished among members. Compared to customs unions and common market, a free trade area is the least institutionalized form of economic integration, where each member of the FTA keeps its own external tariffs and other regulations for trade with non-member countries. An FTA may offer advantages to all member countries. An FTA is likely to increase interregional trade and enhances competitiveness, productivity and efficiency. Trade creation, trade diversion, and terms of trade are the components of static effects. When the removal of trade barriers promotes trade among the members (trade creation effect), it sometimes does so at the expense of imports from non-members (trade diversion effect). If an FTA leads to a reduction in imports from non-members, FTA members are likely to experience improvement in their terms of trade vis-à-vis non-members (terms of trade effect). The trade creation effect and terms of trade effect lead to an increase in economic welfare of the members, while the trade diversion effect is likely to reduce economic welfare of the members because imports from most efficient suppliers in non-members are replace by imports from less-efficient member producers. It is important to note that for non-economic welfare. The free trade scenario analysis assumes that there will not only be normal trading relations with India but SAFTA will also be operative and there will be no tariff or custom duty on imports from India. However, the domestic taxes at the border level would continue to prevail. Besides, duty drawback and other tariff neutralization measures for inputs as well as export incentives would be available. It will

be useful to mention that the trade diversion means that a free trade area diverts trade, away from a more efficient supplier for example from rest of the world (ROW), towards a less efficient supplier within the FTA for example India. The trade3 diversion may reduce a country's national welfare but in some cases national welfare could improve despite the trade diversion, depending upon the particular situation. In contrast, trade creation implies that a free trade area creates trade that would not have existed otherwise. As a result, supply occurs from a more efficient producer of the product.

*4.6 Non Economic Benefits*

Besides the welfare and terms of trade gains suggested by the simulations, regional trade liberalization under SAFTA may have many non-economic benefits to a small country like Pakistan, particularly social and political benefits; those are difficult to account for in a quantitative way. For example, SAFTA can help its members to speak with one voice in global negotiations and develop a common understanding on several global trade-related issues. It could also reduce the political disputes among members and make the region a more attractive location for foreign direct investments. This is critical for a developing country like Pakistan as it is typically unable to fully finance its growth in investment with domestic savings. Since absorptive capacity in Pakistan is crucial for obtaining significant benefits from FDI, liberalization of trade and FDI policies needs to be complemented by appropriate policy measures with respect to education, RandD, and human capital accumulation if Pakistan is to take full advantage of increased trade and foreign investment. Since the proximity, history and cultural familiarity associated with trade are important determinants of foreign trade, the expansion of the neighboring market following trade liberalization could be more important for Pakistan to exploit economies of scale and able to avoid transport and other costs of trade to more distant markets. It is widely believed that the outcome of an RTA depends mainly on the membership, the policies intended to pursue and the effectiveness of the proposed institutional mechanism. Therefore, member countries of SAFTA should set their own agenda and priorities as a bloc, in order to face the impact of future trade issues under the global framework without jeopardizing their growth prospects and interests. Moreover, political willingness and commitments are equally important for the success of any trade agreement. Lastly, to be consistent with the multilateral process RTAs should be outward looking and that they are more likely to facilitate liberal multilateral trade. The outward orientation of any RTA is judged on the basis of its consistency with Article XXIV of the GATT.As results suggest; that the increase in volume of imports under all the trade liberalization scenarios will have an adverse impact on the competitiveness of some domestic industries, and hence export sales. Since Pakistan's industries are still developing, policy makers should ensure that domestic production is not severely affected from foreign competition, and that exports remain competitive on the world market. Therefore, governments should adopt selective trade policy instruments to protect domestic industries and expand production, while yielding the benefits of trade liberalization in the presence of economies of scale. A policy maker might want to consider the other socio-economic objectives of trade policy such as the development of labour intensive and high value added industries. The reduction of the overall dependence on imported inputs cannot be over-emphasized. As with any other policy, trade policy must necessarily be pro-people to reduce inequalities and enhance economic development. The challenge for policy makers in Pakistan is thus to design trade policy

to improve the welfare of citizens and take advantage of new opportunities that would be created by trade liberalization, while protecting most vulnerable groups in the economy from possible adjustment costs and insecurities. Thus, the provision of a basic safety net would be needed to ensure that individuals and families do not fall below minimum standard of living which is an important ingredient in ensuring equity and political acceptability of the trade reforms.

**5. Conclusions**

The simulation results presented and analyzed here demonstrate the importance of experimental designs, and the usefulness of the global CGE modeling framework for examining the impacts of the different types of trade policy reforms for Pakistan. Although, the GTAP model cannot capture the dynamic effects of trade liberalization, it is a useful tool for generating comparative static results for a variety of trade reform scenarios. It also identifies the industries that will expand, and those that will contract, and the size of these changes as a result of various trade liberalization scenarios. The results suggest that Pakistan would experience the highest welfare gain under the combined policy reform of the SAFTA cum 15 percent uniform external tariffs while the SAFTA on its own gives the second highest welfare gains. SAFTA allows the participating countries to achieve larger economies of scale in production, attain specialization, increase competitiveness and diversify their export basket, thus assisting domestic economic reform. Therefore, harmonizing economic policies among neighboring countries must receive higher priority in the policy making process. Although, simulation results are highly sensitive to the underlying data and assumptions regarding the reference scenarios, the results clearly provide an assessment of the implications of SAFTA.

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