



A Household Level Analysis of the Pakistan–Malaysia Free Trade Agreement

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Muhammad Aamir Khan

Department of Economics, COMSATS Institute of Information Technology (CIIT) Islamabad, Pakistan m.aamir.khan@comsats.edu.pk

Qaisar Mehmood

Department of Management Sciences, COMSATS Institute of Information Technology (CIIT) Islamabad, Pakistan

Muhammad Zakaria

Department of Economics, COMSATS Institute of Information Technology (CIIT) Islamabad, Pakistan

Muhammad Iftikhar ul Husnain

Department of Economics, COMSATS Institute of Information Technology (CIIT) Islamabad, Pakistan

Abstract

Pakistan and Malaysia have a significant bilateral economic relationship. The Pakistan–Malaysia Free Trade Agreement (FTA) was signed in 2007, and was implemented in 2008. Pakistan's volatile exports to Malaysia never achieved a sustainable period of growth. Trade balance has not achieved significant changes even after 9 years of implementation of the agreement. With this backdrop, this study first quantifies the current FTA between Pakistan and Malaysia and then suggests changes that could be made to improve the outcome for Pakistan. A new global economic trade model is adapted to include more detailed information on Pakistan's labor and household groups into the Global Trade Analysis Project (GTAP) database. This allows for a more detailed analysis of the impact of the FTA on Pakistan at the household level. The results show that there is win–win scenario for both Pakistan and Malaysia if both are able to renegotiate the current FTA to get the same tariff concession as awarded to each other's trading partners.

JEL Classifications: F14, F41

Keywords

Free Trade Agreement, GTAP, Income inequality, Pakistan, Malaysia

Corresponding author:

Muhammad Zakaria, Department of Economics, COMSATS Institute of Information Technology (CIIT) Islamabad, Park Road, Islamabad, 45550, Pakistan.

Email: mzakaria80@hotmail.com

Introduction

Trade liberalization is considered as the basic pillar of achieving an integrated economic world and a growth driver. The removal of tariff and non-tariff barriers on trade is the fundamental feature of the liberalization process. Both developed and developing countries have come a long way in integrating their economies through bilateral trade and investment. In case of developing countries, the process is new and is started by most countries from 1980s onwards. Liberalization and improved integration of the world has provided a unique opportunity for economic development through trade. Proponents of trade liberalization argue that trade openness has positive effect on the economic growth of the developing countries as it anchors and strengthens bilateral relationship of a (developing) country with the rest of the world (particularly with the developed countries). In a more general verdict, outward-orientation is presumed to possess a gamut of benefits for an open economy (Balassa, 1978, 1985; Dornbusch, 1992). However, the opponents state that these claims are often exaggerated as the economic literature on trade indicates (Rodríguez and Rodrik, 2000). Classical trade theory advocates a positive welfare with trade liberalization. Heckscher–Ohlin's model postulates an increase in exports and production in the division that focuses more on the production part of any economy. Modern trade theory emphasis more on efficiency gains due to globalization which are primarily due to economies of scale, diffusion of information, technology transfer, spillover effects, etc. But, these authoritative theories unable to still fail to elucidate the effect of trade liberalization when factors such as non-tradable goods, non-homogenous goods, specific factors or segmented labor markets are taken into account (Winters et al., 2002).

The empirical literature has shown that free trade and growth remained positively correlated during the last three decades (Balassa, 1985; Barro and Sala-i-Martin, 2004; Ben-David, 1993; Coe and Helpman, 1995; Dollar, 1992; Edwards, 1989, 1992, 1998; Greenaway et al., 1998, 2002; Levine and Renelt, 1992; Sachs and Warner, 1995; Vamvakidis, 1998; Wacziarg, 2001; Wacziarg and Welch, 2003; Zakaria and Ahmed, 2013). On the cost side, some studies have cast doubt about these empirics and criticized the positive link between trade liberalization and growth (Harrison and Hanson, 1999; Rodríguez and Rodrik, 2000; Rodrik, 1998). Other studies such as Agosin (1991), Clarke and Kirkpatrick (1992), Greenaway and Sapsford (1994), Shafaedin (1994) and (Jenkins (1996)) also find little evidence about positive linkages between trade policy and growth.

The most prominent trade liberalization skeptics include Krugman (1994) and Rodrik (1995), who argue that the effect of free trade on growth is, at best, very tenuous, and, at worst, doubtful. Vamvakidis (2002) shows that positive correlation between free trade and growth is only a recent phenomenon. Vamvakidis even finds a negative correlation in the early period of the twentieth century. Grossman and Helpman (1990, 1991) and Romer (1992) develop models in which opening up to trade adversely affects growth. Mosley (2000) goes on to argue that growth responds positively to higher levels of effective protection, particularly, if protection promotes investment in the research-intensive sectors of the relevant country.

Further, it is preposterous to suggest that trade openness by itself is sufficient to stimulate growth. For instance, in the absence of macroeconomic stability, policy credibility and enforcement of contracts, it is quite unlikely that a country will be able to register significantly high growth rates for a sustained period.

During the early 1980s Pakistan was persuaded to implement trade reforms along with structural adjustment policies, enforced by the International Monetary Fund, the World Bank and other international institutions, as an imperative step towards free-market economy. During the period of its debt crisis (1980s) Pakistan showed grave proclivity for a free-market economy and conceded all kinds of conditionalities imposed by the world organizations to acquire financial support. Consequently, during the mid-1980s trade reforms were implemented and trade liberalization was

institutionalized. Pakistan became member of the World Trade Organization (WTO) as a result of the Uruguay Round on trade negotiations (1986–1994) to elicit gains from implementation of the new regime of multilateral trade liberalization like other countries, under the ambit of the WTO.

It involved policy measures that called for reducing the level of tariffs, replacing quantitative restrictions with tariffs, introducing uniformity in tariff structures and levels, and reducing the severity of other kinds of taxes on international trade. This process of trade liberalization continued in 1990s and early 2000s as well. In the post-2000 period, Pakistan oriented its policy towards signing Regional Trade Agreements (RTAs) and in the process signed its first Free Trade Agreements (FTA) with Sri Lanka in 2005. In later years, the FTAs with South Asia (2004), China (2007), Malaysia (2007) and Mauritius (2007) and the preferential trade agreements (PTAs) with Iran (2004) and Indonesia (2005) were signed.

This paper examines the economic impact of the Pakistan–Malaysia FTA by using a global static Computable General Equilibrium (CGE)-based MyGTAP (Global Trade Analysis Project) model. The economy wide impact analysis of Pakistan–Malaysia FTA is important to understand the effects of trade liberalization on economic growth, production, trade, wages, investment and household income. The absence of any such study using general equilibrium analysis also validates the necessity for a study to analyze the impact of Pakistan–Malaysia FTA on the economies both countries.

The paper is arranged as follows. Section 2 provides an overview of Pakistan's trade agreements. Section 3 discusses the literature review. Section 4 explains the methodology. Section 5 provides results along with their interpretations. The final section concludes the paper.

Pakistan trade agreements

Pakistan has signed 12 FTAs, in which 11 are implemented and 1 is delayed. Table 1 provides detail of all these agreements. A total of six agreements are under negotiations with Bangladesh, Gulf Cooperation Council countries, Morocco, Singapore, Thailand and Turkey. The important agreements include FTAs with China, Malaysia, Mauritius, South Asia, and Sri Lanka and PTAs with Indonesia and Iran. The initial phase of agreements started in 2005 and by 2008 most of the agreements had been signed. In the next 8 years to 2016, only one notable agreement (Pakistan–Indonesia PTA) was finalized. The pace gained in terms of bilateral integration in the previous decade decreased in the current decade. In contrast, the Malaysian economy is slightly more integrated with other economies as compared with Pakistan. As of 2016, Malaysia has signed and implemented 14 trade agreements and additional 2 FTAs are signed but still are not applied. Besides, negotiations are ongoing with five other countries (Asian Regional Integration Centre, ADB)

The level of integration within South Asia is inadequate due to political and security issues between the two biggest economies of the region, India and Pakistan. Pakistan has initiated integration with other economies in the region by signing FTAs with Sri Lanka and starting FTA negotiations with Bangladesh. The integration with Central Asia and the Middle East is not enough to have a significant economic impact, therefore, RTAs were signed with Sri Lanka, China, Malaysia and Indonesia to expand and diversify the markets, increase trade flow and reap the benefits of integration.

Table 2 illustrates the Pre and Post-impact of Pakistan's FTAs and PTAs on trade balance and export growth. The exports to any of the major partner have not increased to the extent that the trade balance could turn positive. From 2011 onwards, the export performance has been particularly appalling with respect to all countries and exports are declining. The analysis suggests that

Table 1. Pakistan Free Trade Agreements.

Agreement	Partner(s)	Agreement type	WTO	Year
Signed and implemented				
Pakistan–United States Trade and Investment Framework Agreement (TIFA)	United States of America	Bilateral	Un-notified	2003
Pakistan–Sri Lanka Free Trade Agreement (PSFTA)	Sri Lanka	Bilateral	Enabling clause	2005
South Asian Free Trade Agreement (SAFTA)	Pakistan, India, Sri Lanka, Bangladesh, Bhutan, Nepal and Maldives	Regional	Enabling clause	2006
Pakistan–Iran PTA	Iran	Bilateral	Un-notified	2006
Pakistan–Mauritius PTA	Mauritius	Bilateral	Enabling clause	2007
Pakistan–China Free Trade Agreement (PCFTA)	China	Bilateral	GATT, GATS	2007
Economic Cooperation Organization Trade Agreement (ECOTA)	Pakistan, Iran, Tajikistan, Afghanistan, Turkey, Azerbaijan, Kazakhstan, Kyrgyz Republic, Turkmenistan, Uzbekistan	Regional	Enabling clause	2008
Malaysia–Pakistan CEPA	Malaysia	Bilateral	GATS and enabling clause	2008
Pakistan–MERCOSUR PTA	Argentina, Brazil, Uruguay and Paraguay	Multilateral	Un-notified	2009
Preferential Trade Arrangement of Developing Eight (D-8)	Bangladesh, Indonesia, Malaysia, Pakistan, Egypt, Iran, Nigeria, Turkey	Multilateral	Un-notified	2011
Pakistan–Indonesia PTA	Indonesia	Bilateral	Un-notified	2013
Signed but un-implemented				
Trade preferential system of the OIC	41 member countries of OIC	Multilateral	Un-notified	2014

Source: Asian Regional Integration Centre, ADB (For details see <https://aric.adb.org/fta>).

CEPA (Closer Economic Partnership Agreement); GATT (General Agreement on Tariffs and Trade); GATS (General Agreement on Trade in Services); OIC: Organization of the Islamic Countries; PTA: preferential trade agreement; WTO: World Trade Organization.

trade performance with any of the partner has not been in parity and remained below the potential, which the trade agreement envisioned.

Pakistan–Malaysia FTA

The FTA between Pakistan and Malaysia was preceded by an Early Harvest Program (EHP) which was initiated in 2005 and implemented on 1 January 2006. Under the EHP, the bilateral tariff structures by both countries were based mainly on most favored nation (MFN) tariffs for 2005 along with concession in selected items offered independently by both countries for the period of 1.5 years. The objective of the EHP was to analyze the impact of the liberalization exercise between the countries before the comprehensive FTA was signed. The completion of the EHP led both the countries to further the integration process and accomplish the signing of FTA. Finally, the FTA

Table 2. Pakistan's trade balance performance in major trade agreements (million USD).

Country	Year of implementation	Exports in year of implementation	Trade balance in year of implementation	Pakistan exports in 2015	Trade balance in 2015	Exports growth 2011–2015 (%)
All countries	–	–	–	22,089.0	–21,900.6	–3
Sri Lanka	2005	153.6	94.5	260.0	187.7	–7
China	2006	506.6	–2408.3	1934.9	–9084.1	1
Mauritius	2007	35.5	35	22.2	–38.7	–6
Malaysia	2008	138.1	–1555.6	186.2	–724.7	–5
Indonesia	2013	144.4	–1063.9	140.7	–1901.0	–11

Source: ITC calculations based on UN COMTRADE statistics.

USD: United States Dollars

Table 3. Major economic indicators 2008 and 2015.

Indicators	Pakistan		Malaysia	
	2008	2015	2008	2015
GDP (billion USD)	170.1	271.1	230.8	296.3
Economic growth (%)	1.7	4.7	4.8	5.0
Per capita income (USD)	1042.8	1434.7	8486.6	9768.3
Current account balance (billion USD)	–15.6	–1.6	39.4	3.6
Merchandise trade as percent of GDP	36.8	24.5	154.1	126.8
Exchange rate (per USD)	70.4	102.7	3.3	3.9

Source: World Bank National Accounts data, and OECD National Accounts data files.

GDP: gross domestic product; USD: United States Dollars

was signed on 8 November 2007 and subsequently implemented on 1 January 2008. This was the first ever comprehensive FTA signed by Pakistan with any country. The FTA was also the first ever between two Muslim countries and the first of Malaysia's FTA with a South Asian country. This agreement covered trade in goods and services, investment and cooperation in technical areas between Pakistan and Malaysia. The agreement envisioned enhancement of cooperation in various areas of bilateral interest such as sanitary and phytosanitary measures, intellectual property protection, construction and telecommunications for capacity building. The full implementation of the FTA terms was completed by the year 2014 under several tracks. Table 3 illustrates the impact on major economic indicators of both Pakistan and Malaysia before and after the FTA.

Table 3 shows that both the countries benefitted from the agreement in terms of an increase in real gross domestic product (GDP), per capita GDP and economic growth. Pakistan's current account balanced improved substantially after 2008 and its growth rate increased from 1.7 in 2008 to 4.7 in 2015. Merchandise trade as a percent of GDP decreased in both economies and currencies in each country were depreciated. In general, it is concluded that both countries gained from the agreement through expansion in trade.

The tariff structure offered by Pakistan to Malaysia under the FTA is given in Table 4. The items were divided into five tracks for implementation of tariffs in a period of 6 years. Most items, one fourth of the total, had their tariffs cut by 2009 and furthermore in next tracks the number of item share in tariff lines was decreased. The final tariffs for initial two tracks were same and only the implementation year was different. In the next tracks, the final rates of 5, 10 and 20 were

Table 4. Tariff tracks offered by Pakistan under Pakistan–Malaysia FTA.

Tracks	No. of tariff lines	Share in total tariff lines (%)	Agreed duty (%)	Implementation year
Fast track	1703	25.0	0	1 January 2009
Normal track	1236	17.7	0	1 January 2012
Sensitive track-1	796	11.7	5	1 January 2011
Sensitive track-2	593	8.7	10	1 January 2014
Sensitive track-3	1423	20.9	20	1 January 2011

Source: Ministry of International Trade and Industry (MITI), Government of Malaysia.
FTA: free trade agreement

Table 5. Tariff tracks offered by Malaysia under Pakistan–Malaysia FTA.

Tracks	No. of tariff lines	Share in total tariff lines (%)	Agreed duty (%)	Implementation year
Fast track	6699	63.2	0	1 January 2009
Normal track	1215	11.5	0	1 January 2012
Sensitive track-1	224	2.1	5	1 January 2011
Sensitive track-2	616	5.8	10	1 January 2014
Sensitive track-3	1271	12.0	20	1 January 2011

Source: Ministry of International Trade and Industry (MITI), Government of Malaysia.
FTA: free trade agreement

implemented in 2011, 2012 and 2014 respectively. By 2012, the final tariff rates of 91.3% lines were implemented.

Table 5 provides the tariff tracks offered by Malaysia under FTA to Pakistan. In the tariff tracks offered by Malaysia, most tariff lines (63.2%) were offered in the fast track. The final duty of 0% was applied on three quarters (74.7%) of the tariff lines. The rest of the tariff lines (25.3%) were offered in sensitive tracks. By 2012, the final rate on 94.2% of tariff lines was already implemented. On comparison, Malaysia offered more items under fast track and normal tracks, and Pakistan offered more items in the sensitive tracks. The full implementation of the FTA on all the tariff lines was completed on 1 January 2014 by both the countries.

Pakistan–Malaysia trade

The Pakistan–Malaysia trade always remained in the favor of Malaysia for the past 1.5 decades (Figure 1). Pakistan exports never crossed the mark of 250 million USD and the highest exports value was 243 million USD in 2011. On the other hand, the imports from Malaysia have been more volatile and have achieved the highest 2.55 billion USD value in 2011. The largest bilateral trade of 2.8 billion USD was recorded in the same year. After the FTA in 2008, trade increased for the next 3 years till 2011, but afterwards the trade dropped gradually in both countries due to surge in Chinese imports to Pakistan during 2012 to 2015. It is pertinent to mention here that share of Chinese imports has increased from 14.2% in 2011 to 45.1% in 2015.

Pakistan's exports to Malaysia remained concentrated in cereals sharing more than 50% of the total exports over the past years (Figure 2). In the pre and post-years of the FTA, the export items have not changed and the magnitude has also not risen constantly. Total exports increased till 2011

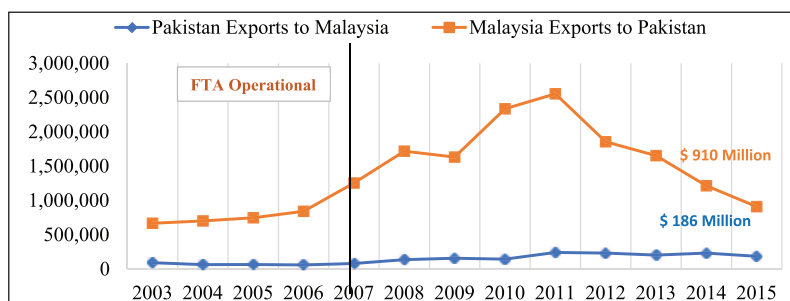


Figure 1. Bilateral trade between Malaysia and Pakistan 2003–2015 (million USD).

Source: ITC calculations based on UN COMTRADE statistics.

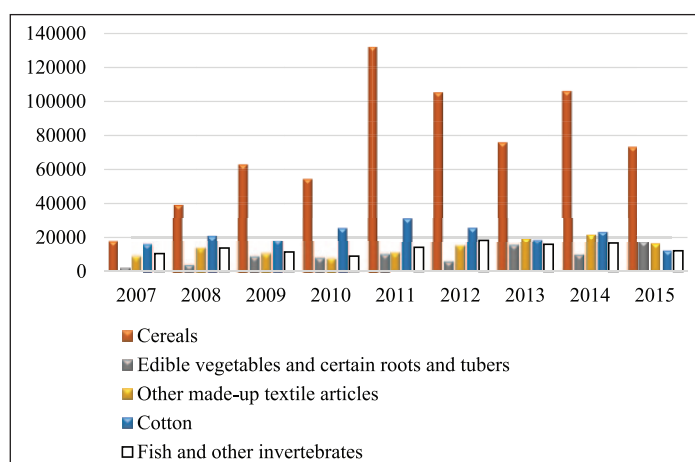


Figure 2. Pakistan top exports to Malaysia 2007–2015 (million USD).

Source: ITC calculations based on UN COMTRADE statistics.

and afterwards gradually declined because Pakistan's trade with China increased substantially from 2011 onward. Malaysia's major export item to Pakistan is palm oil, which consists of around 75–80% of the total exports in the last decade (Figure 3). Pakistan decreased its palm oil import from Malaysia in the past 4 years and started importing it from Indonesia. The huge surge in imports from Indonesia after 2012 has been due to signing of the Pakistan–Indonesia PTA. Imports from Indonesia increased from 929 million USD in 2011 to 2.04 billion USD in 2015. Basically, Pakistan's import of palm oil has diverted from Malaysia to Indonesia after the PTA. Another reason is the imposition of export duty by the Malaysian Government on palm oil exports in 2015 (Ministry of International Trade and Investment, Government of Malaysia). The other significant import from Malaysia is mineral fuels and products, which mainly increased after 2011.

Currently, Malaysia's major FTAs (Malaysian–India FTA, Malaysia–China FTA and Malaysia's agreement with Vietnam, Indonesia, and Thailand under Association of Southeast Asian Nations (ASEAN) are major impediments in the utilization of the Malaysia–Pakistan FTA) with China, India and ASEAN region have lessened the beneficial impact of tariff concessions provided to Pakistan under the FTA in vital industries, such as textile, wearing apparel, leather, vegetable & fruit and cereal grains, which are also major exports of India and Vietnam to Malaysia. In discussing implications of

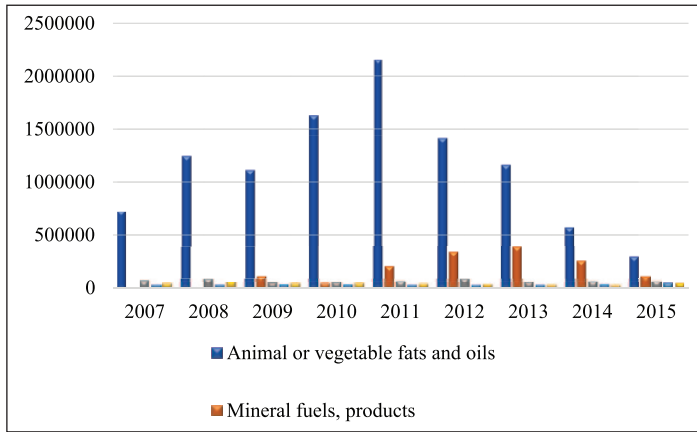


Figure 3. Pakistan top imports from Malaysia 2007–2015 (million USD).

Source: ITC calculations based on UN COMTRADE statistics.

Note: Not included (HS2 Aircraft, spacecraft, and parts) though it is the 4th highest import in 2015 but had no imports between 2007–2014.

bilateral agreements for the Pakistan's economy, Khan (2009) concludes that Pakistan is susceptible to negative impacts of other regional bilateral RTAs because of already less trade integration and weak resilience against competition in trade sector. Table 6 describes the Malaysia's tariff for Pakistan and average tariff for three countries of ASEAN that include Indonesia, Thailand and Vietnam. The tariff structure indicates that Pakistan is discriminated against the countries of ASEAN. Malaysia has imposed high tariffs on trade sectors which have great importance for the economy of Pakistan compared with ASEAN countries. The textile sector, wearing and apparel, leather, beverages, and manufacturing sectors face up to 10 times more tariff than their South East Asian counterparts.

Trade, growth and income inequality

It is generally believed that increase in trade leads to economic growth which in turn is seen as an end to rising income inequality. Constant research is carried out to solidify this potential effect of trade openness on poverty by developing nations. Previous research, and theories like the Heckscher–Ohlin model, for example, supports this by stating that more trade means more production within an economy. Majority classical and neoclassical trade theories similarly state that with trade liberalization, growth rises. Modern trade theory suggests that beneficial trade liberalization is caused by economies of scale, access to information, technology transfer, and spillover effects. What the theories fail to explain is how such an impact occurs, what linkages exist for it to occur, and when non-tradable goods, non-homogenous goods, specific factors or segmented labor markets are accounted for (Winters et al., 2002). In this research, we investigate the impact of the Pakistan–Malaysia FTA at the macro level as well as the household level in Pakistan. Trade policy will have distributional impacts and that the impacts on poor households should be given special consideration when making trade policy.

Literature review

Several studies have studied the economic impact of various trade agreements signed in South Asia and East Asia. The positive relationship of liberalization and economic growth is supported globally and within Pakistan (Dao, 2015; Din et al., 2003; Shahbaz, 2012; Siddiqui and Iqbal,

Table 6. Malaysia tariff for Pakistan and ASEAN in 2011.

Sector code	Detail	Tariff for Pakistan	Tariff for selected countries in ASEAN ^a
Pcr	Processed rice	40	40
V_F	Vegetable and fruit	0.248	2.01
Lea	Leather	3.22	0.61
Ofd	Processed food	0.227	1.08
Wap	Wearing apparel	15.9	0
Tex	Textile	11.3	0
Livestock	All livestock	0.163	0
Fsh	Fish	0.579	0
Lum	Leather	3.94	0.92
Crp	Chemical, rubber, plastic prods	5.99	1.35
Omeomf	Manufacture and machinery	1.41	0.24
I_S	Ferrous metals	46.8	2.98
Fmp	Metal products	15.8	3.71
Mvhotn	Motor vehicle and transport	5.7	0.73
Ppp	Paper products, publishing	12.9	2.28
Nmm	Mineral products	23.2	1.98
Ele	Electronic equipment	0.321	0

Source: GTAP 9a Database.

^aAverage tariff for Indonesia, Thailand, and Vietnam.

^bExtremely high tariff on some items increases the aggregated tariff.

ASEAN: Association of Southeast Asian Nations.

2005; Zakaria and Ahmed, 2013). The study for impact analysis of Pakistan–Malaysia FTA using any CGE-based model has not been carried out as per our knowledge. The list of studies using CGE model to analyze the impact of trade agreements on welfare is provided in Table 7.

The findings of literature on trade liberalization and economic growth show that each country gains from trade with varying degree depending upon its socioeconomic characteristics. For example, Pohit and Saini (2015) report that Pakistan and India both gain from trade in the presence of trade productivity. Tariff reduction can increase growth by 1–2% while under tariff plus trade facilitation 6–7% growth can be achieved in Pakistan and Turkey (Durongkavoroj, 2015). Trade facilitation is expected to augment inter and intra-regional trade in South Asia (Hertel and Mirza, 2009). Many other studies also reveal that benefits spill over for all nations irrespective of their geographic location (Acar et al., 2009; Dao, 2015; Khoso et al., 2011; Mitsuyo and Shujiro, 2015; Siddiqui and Iqbal, 2005). The literature suggests that regional countries need to sign trade agreements to achieve their development goals.

Methodology

The impact of trade liberalization can be measured in a model which can transmit the effect on inputs and prices in the whole economy. The change in prices and inputs affects output, employment and the external sector that is, trade in an economy. The global static CGE model can be used adequately to quantify the impact of a trade policy changes. The next section explains the model in detail.

Table 7. Literature review.

Study	Measure	Tool	Data	Identification scheme	Results
Pohit and Saini (2015)	Trade liberalization and transport improvement	Welfare analysis	Pakistan, India and South Asia	CGE/GTAP model (base year 2007)	India and Pakistan gain but only if transport productivity occurs in both countries.
Bandara and Yu (2003)	Trade liberalization; partial and full scenarios	Welfare analysis	South Asia, and SAFTA plus ASEAN, NAFTA and EU	CGE/Standard GTAP model	The major gainer is India followed by other regional economies. The study suggests bilateral instead of multilateral trade agreements.
Durongkavoroj (2015).	Trade liberalization, trade facilitation	Welfare analysis	ASEAN, RCEP, Turkey, Pakistan	CGE/GTAP standard model	ASEAN simultaneous FTA with Pakistan and Turkey results in a growth of 1–2% under tariff reduction only and 6–7% under tariff plus trade facilitation.
Narayanan et al. (2016)	Trade facilitation	Welfare analysis	Common wealth countries	CGE/GTAP model	The results find gains in welfare, GDP, employment and trade for the member countries including Pakistan.
Raihan and Razzaque (2007)	SAFTA complete implementation	Welfare gains	Pakistan and South Asia	CGE/GTAP model SAM 2002	All the economies in South Asia, except Bangladesh, gain under the full implementation.
De et al. (2013)	MFN status to India and trade-facilitation measures	Welfare gains	India and Pakistan	CGE/GTAP model	Results indicate that both economies gain under the scenario. The gains by India are more against smaller economies
Siddiqui (2007)	Trade Liberalization of global rice and agriculture sector	Welfare and Poverty analysis	Pakistan	CGE/GTAP model SAM 2002	The results show gains from trade of both sectors. Though the gains augment in the long run.
Hertel and Mirza (2009)	Trade facilitation	Impact on trade	Pakistan, India, South Asia	CGE/GTAP model & partial equilibrium analysis	The measure for trade facilitation would augment intra and inter regional trade for all the South Asian economies. Smaller economies gain more.
Islam et al. (2015)	Trade liberalization in South Asia	Welfare impacts	South Asia	Standard and Recursive Dynamic GTAP models	Results indicate that the larger economy, India, will gain the most under the standard model. The dynamic model shows negative welfare impact.

Table 7. (Continued)

Study	Measure	Tool	Data	Identification scheme	Results
Khoso et al. (2011)	Trade liberalization	Welfare analysis	Pakistan, India and SAFTA	CGE/GTAP model	• Trade liberalization produces gains for both India and Pakistan.
Acar et al. (2009)	Liberalization under FTA between three countries	Welfare and impact analysis	Malaysia, Bangladesh and Indonesia	Standard CGE/GTAP model	• Malaysia and Bangladesh suffer GDP and trade loss. While Indonesia gains in both. Likewise, welfare only increases in Indonesia.
Mitsuyo and Shujiro (2015)	Tariff reduction under FTAs	Trade creation	Malaysia, Japan, Indonesia and Thailand	Gravity model	• The agreement with the three countries does not generate trade gains for Japan.
Shaikh et al. (2012)	Tariff reduction and MFN status to India	Bilateral impact analysis	Pakistan and India	Standard GTAP model	• The results indicate that both Pakistan and India gain from increase in bilateral trade.
Siddiqui and Iqbal (2005)	Trade openness transmission mechanism	Economic growth	Pakistan 1973–2008	3SLS technique	• Trade openness does not impact directly but impacts domestic investment, which further induces economic growth.
Din et al. (2003)	Trade openness	Economic growth	Pakistan 1960–2001	Granger causality	• Study concludes no short run causality between growth and openness but in long run two-sided causality is valid.
Wignaraja (2014)	Trade liberalization	Quantifying impact	India, South Asia	CGE model	• India gains more in integration with East Asia than with EU and USA. India remains the major beneficiary in South Asia.
Dao (2015)	Trade liberalization	Economic growth	71 countries 1980–2010	Panel data technique/pool OLS regression	• Results indicate positive and substantial relationship between trade openness and growth. The relationship was stronger in decades before 2000.
Shaheen et al. (2013)	Trade liberalization	Economic growth	Pakistan 1975–2010	Johannsen co-integration approach	• Trade liberalization has positive impact on economic growth in long run.
Zakaria and Ahmed (2013)	Trade liberalization	Economic growth	Pakistan 1981–2008	Simultaneous equation model	• Trade liberalization has positive impact on economic growth.

3SLS: Three Stage Least Square; ASEAN: Association of Southeast Asian Nations; CGE: Computable General Equilibrium; EU: European Union; FTA: free trade agreement; GDP: Gross domestic product; GTAP: Global Trade Analysis Project; MFN: Most favored nation; NAFTA: North American Free Trade Agreement; OLS: Ordinary Least Square; RCEP: Regional Comprehensive Economic Partnership; SAFTA: South Asian Free Trade Area; SAM: Social Accounting Matrix; USA: United States of America.

CGE model

The CGE model provides the framework for the economy to cumulate the decisions of all producers and households in response to a change in price. The CGE model is foremost for regional economic analysis (Partridge and Rickman, 1998). The major benefit of the global CGE model is its ability to relate the cross linkages within the economy. The model is based on neoclassical theory and assumes perfect competition structure with constant returns to scale, and a profit maximizing behavior of firms and utility maximizing behavior of the consumer. Blake (1998) describes that a CGE model is based on neoclassical theory where producers make their decisions on cost minimizing and profit maximizing and the consumers make their decisions on achieving utility maximization. The model can explain the interlinkages within the economy and the behavioral equations describe the effect of a price change on the interlinkages (Minor and Walmsley, 2013). The models are consistent and capture both the economy wide different sectors and their interaction and interlinkages between the sectors of the economy. The global CGE model can be performed with the help of the GTAP model and is supported by the GTAP modelling framework and its worldwide database act as the source of trade data for the model.

MyGTAP model

The multi sector and multi region CGE model has been adapted using a newly developed MyGTAP model (Minor and Walmsley, 2013), which is an extension of a standard GTAP model (Hertel and Tsigas, 1997). This model captures the interlinkages of factor, price and markets (Minor and Mureverwi, 2013). The model has a consistent global database covering all regions in such a way that the database can demonstrate the effects of a policy change on all other countries. The database depends on the individual country input–output tables and the global MyGTAP database of trade, macro economy and protection data. The MyGTAP model is an enhanced version of standard GTAP model (Figure 4). The standard GTAP model has just one private representative household, while MyGTAP model gives the option to incorporate multiple household and factor types which help to explain the comprehensive linkages between various households and their income and expenditure within the economy. The differentiated number of households based on the level of income and factors augments the model ability to capture the impact of a policy change on the welfare of all the households. The expenditure is divided into three components, the private expenditure, government expenditure and investment savings. Regional households own factors of production and they supply the endowments for income to the firms, which use them and the intermediate goods to produce output and supply goods and services to households and government to satisfy their demand. The private households and government saving is the total regional saving which is further channelized for investment. The new features introduced in the model are regional transfers including remittances, foreign aid and foreign income (Figure 5).

The model is used widely to analyze the policy changes related to trade policy, climate change, migration, poverty and in energy policy. The model provides the adequate framework and database for the analysis of trade policy.

Database and aggregations

This research uses two comprehensive data sets, the latest available GTAP Database 9a (Aguiar et al., 2016) and the additional data is taken from Pakistan's Social Accounting Matrix (SAM) developed by International Food Policy Research Institute (IFPRI) for the year 2010–2011 (IFPRI 2015). The latest comprehensive Pakistan's SAM 2010–2011 is incorporated in the GTAP model

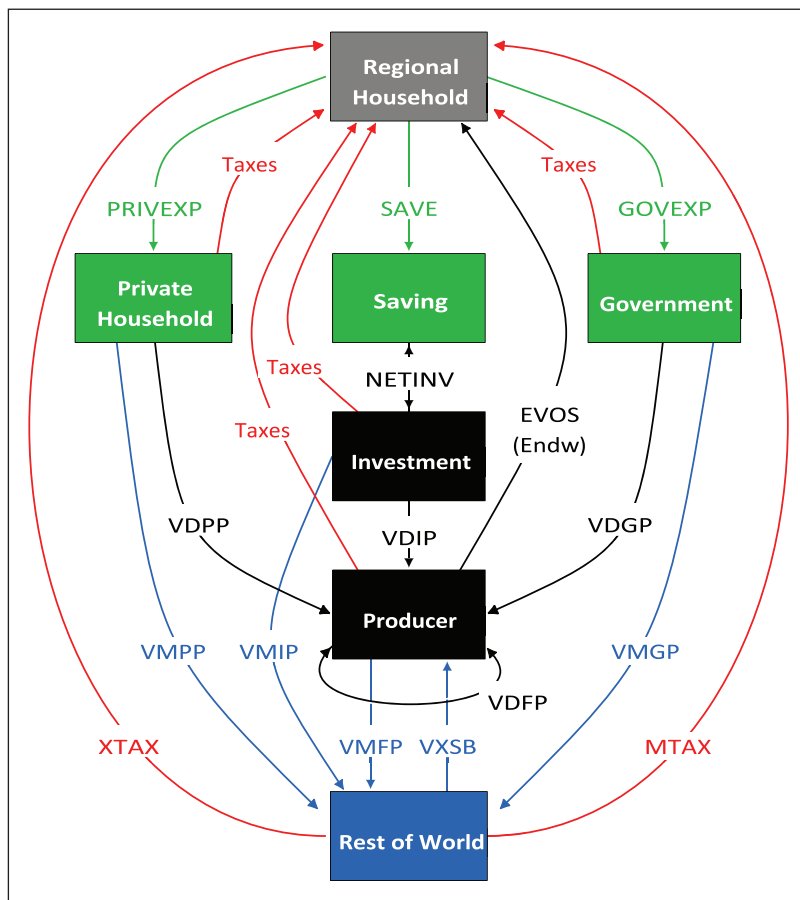


Figure 4. Circular flow in the standard model.

Source: Corong et al. 2017.

GovEXP: government expenditure; MTAX: import tax; PRIVEXP: private expenditure; VDFF: value of domestic firm purchases; VDGP: value of domestic government purchase; VDPP: value of domestic private household purchases; VMGP: value of government purchases of imported commodity; VMIP: importer's domestic price of commodity; VMPP: value of imported private household purchases; XTAX: export tax.

to augment the required data. The reference years for the GTAP Database 9a are 2004, 2007 and 2011. The model uses the latest 2011 reference year. The GTAP model includes 140 regions based on individual countries and aggregated regions. The database is based on total 57 sectors for each region. In this model, the regions have been aggregated to a total of 30 regions out of which 26 comprise of single regions and the rest are aggregated regions that include more than one region (see Table A.1 in the appendix). The sectors are aggregated to 46 sectors (see Table A.2 in the appendix).

The latest SAM 2010–2011 for Pakistan incorporates a total of 16 household types, which are differentiated based on rural and urban types (Table 8). With the household types, rural-based households are 12, which are further based on land ownership, farm size and non-farm activity, six of the rural households are farmer, two are farm worker and four are based on non-farm activity. The small farmer owns less than 12.5 acres and the medium farmer owns more than 12.5 acres of agriculture land. The rest of rural-based types are employed in farm-work but they do not own the land. The remaining four are urban-based households.

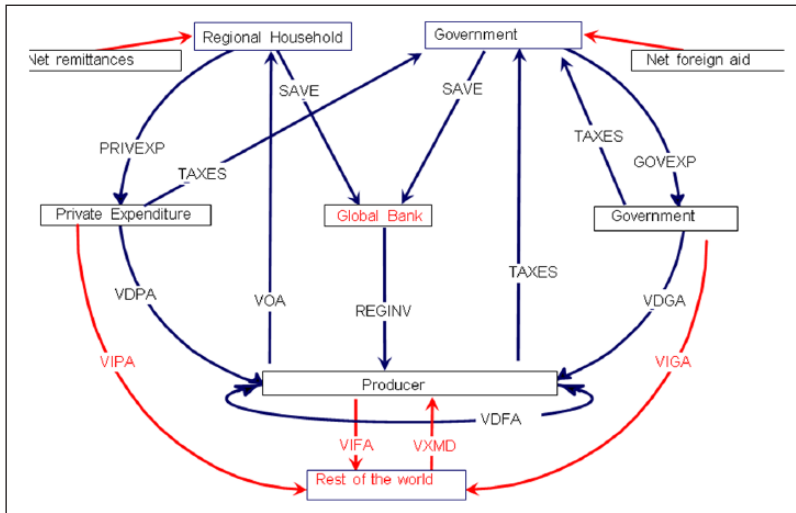


Figure 5. Income and expenditure flows in MyGTAP model.

Source: (Birur et al. 2015).

VDFA: value of domestic firm purchases at agent price; VDGP: value of domestic govt purchases at agent price; VDPA: value of domestic private household purchases at agent price; VIFA: the value of imported firm purchases at agent price; VMGP: value of government purchases of imported commodity; VMIP: importer's domestic price of commodity; VMPP: value of imported private household purchase; VOA: value of output at agent price; VDMA: value of exported commodity at domestic market price.

The factors used in Pakistan's SAM 2010–2011 are shown in Table 9. In the SAM 2010–2011, the factors of production have been divided into a total of 12 types. Out of which three belong to farm labor, two from non-farm labor, three from land, one belongs to livestock and three are capital types namely agriculture machinery like tractors, harvesters and thrashers, formal and informal capital.

Inequality measures

Gini coefficient of inequality. The comparison of an even equality line with the frequency distribution curve of any inequality variable like income is called a Lorenz curve. The inequality measurement tool, the Gini coefficient, is based on the Lorenz curve. The Gini coefficient measures the difference between the equality line and the Lorenz curve. The value of the coefficient ranges between 0 and 1, where 0 is perfect equality and 1 is perfect inequality. The Gini coefficient is presented as follows

$$Gini = \frac{2}{n^2 \bar{y}} \sum_{i=0}^n i(y_i - \bar{y}) \quad (1)$$

where y_i is the wealth or income of person i ; $\bar{y}$ is mean income; and n is total number of households.

Hoover index. The Hoover index which is also known as the Pietra ratio represents the maximum vertical distance from the Lorenz curve to the 45° line of equality (Kawachi and

Table 8. Household types in SAM 2010–2011.

No	Household types	HH code	Population (million)	Income (billion)
1	Rural small farmer (quartile 1)	hhd-rs1	4193	275.6327
2	Rural small farmer (quartile 234)	hhd-rs234	15,565	2232.853
3	Rural medium + farmer (quartile 1)	hhd-rm1	208	14.13264
4	Rural medium + farmer (quartile 234)	hhd-rm234	2914	853.3687
5	Rural landless farmer (quartile 1)	hhd-rl1	3348	194.3888
6	Rural landless farmer (quartile 234)	hhd-rl234	7292	947.8456
7	Rural farm worker (quartile 1)	hhd-rw1	6333	238.9349
8	Rural farm worker (quartile 234)	hhd-rw234	8305	722.2187
9	Rural non-farm (quartile 1)	hhd-rn1	12,595	481.5706
10	Rural non-farm (quartile 2)	hhd-rn2	10,888	645.3767
11	Rural non-farm (quartile 3)	hhd-rn3	9088	849.5021
12	Rural non-farm (quartile 4)	hhd-rn4	6316	1388.453
13	Urban (quartile 1)	hhd-u1	5930	271.7564
14	Urban (quartile 2)	hhd-u2	8820	657.4251
15	Urban (quartile 3)	hhd-u3	11,506	1366.653
16	Urban (quartile 4)	hhd-u4	17,080	6979.068
All households total			130,381	18,119

Source: Pakistan SAM 2010–2011 (IFPRI, 2016). HIES (Household Integrated Economic Survey) 2010–2011. (IFPRI, 2015)

HH: Household; SAM: Social Accounting Matrix.

Table 9. Factor types in SAM 2010–2011.

No	Factor code	Factor types
1	Flab-S	Labor – small farmer
2	Flab-M	Labor – medium + farmer
3	Flab-VV	Labor – farm worker
4	Flab-L	Labor – non-farm low skilled
5	Flab-H	Labor – non-farm high skilled
6	FInd-S	Land – large
7	FInd-M	Land – medium
8	FInd-L	Land – small
9	Fliv	Livestock
10	Fcap-A	Capital – agriculture
11	Fcap-F	Capital – formal
12	Fcap-I	Capital – informal

Source: Pakistan SAM 2010–2011 (IFPRI, 2016). HIES 2010–2011.

SAM: Social Accounting Matrix.

Kennedy, 1997). This index is also known as the Robin Hood index because it is usually interpreted as the proportion of income that has to be transferred from those above the mean, to those below the mean, in order to achieve an equal distribution (Atkinson and Micklewright, 1992). A high value of Hoover index indicates a more unequal society. Hence, a larger share of income needs to be distributed to achieve equality. The Hoover index can be written as follows

$$HI = \frac{1}{2} \sum_h \left| \frac{YH_h}{\sum_h YH_h} - \frac{N_h}{\sum_h N_h} \right| \quad (2)$$

where, YH is household income and N is population.

Model closure

The standard MyGTAP closure is taken as the starting point for our analysis. This assumes that there is perfect competition (zero economic profits) in all sectors. The production factors of capital and labor are assumed to be fully mobile between sectors, whereas land and natural resources factors are sluggish to move. Foreign income flows are assumed to rise or fall with factor prices in the country in which they are located.

Investment is driven by the expected rate of return as in standard GTAP and total domestic savings by the sum of private household savings and the government budget deficit. Hence the trade balance is endogenous.

Policy scenarios

To study the household level impact of the Pakistan–Malaysia FTA, the following two policy scenarios have been developed.

1. **Extended FTA:** A possible extension with both partners awards each other the same tariff concession as awarded to other trading partners.
2. **First scenario plus non-tariff measures (NTMs):** A potential scenario which considers the improvement in trade facilitation. For trade facilitation we reduce the cost generated by non-tariff barrier for trade. Within the GTAP model, these barriers are calculated though ad-valorem equivalents and incorporated into the database under variable AMS i.e. Import-augmenting “technical change” in the Armington nest (Minor and Walmsley, 2013). The scenario helps to understand the significance of non-tariff barriers removal impact on trade. For trade facilitation, we introduce a technological shock in trade to simulate a stronger integration resulting from trade-facilitation improvements. An increase in the AMS indicates that the effective domestic price of good i exported from region r into region s falls and thereby reflects a reduction of real resource costs. According to Hertel (1997) this improvement in trade facilitation helps reduce transit times and associated costs of traded goods, thereby reducing their destination price.

Results and discussion

Impact on major macroeconomic variables

The estimated effect of both scenarios on some selected macroeconomic variables of both Pakistan and Malaysia is provided in Table 10. The macroeconomic variables included are real GDP, real investment, real exports, real imports, terms of trade and rental rate on capital. The first scenario has positive impact on both economies. The impact on real GDP, real investment, real exports and real imports are positive for both economies. Malaysia suffers negatively in terms of trade and rental rate of capital. The positive effect on GDP, investment and trade is of greater magnitude in

Table 10. Percent changes in selected macroeconomic variables of Pakistan and Malaysia.

Variables	Scenario I		Scenario II	
	Pakistan	Malaysia	Pakistan	Malaysia
Real GDP (qgdp)	0.016	0.0101	0.37	0.04
Real investment (qcdgs)	0.08	0.004	0.56	0.02
Real exports (qxwreg)	0.04	0.02	0.41	0.01
Real imports (qiwwreg)	0.08	0.01	-0.12	0.03
Terms of trade	0.03	-0.01	0.19	-0.02
Rental rate on capital (rental)	0.05	-0.03	0.35	0.001

GDP: gross domestic product.

the case of Pakistan. The trade flow for Pakistan expands by 11 million USD in exports and 46 million USD in imports. The exports increase primarily from sectors of textile and wearing apparel. The exports and imports rise by 37 and 17 million USD for Malaysia thus augmenting the positive trade balance.

In the second scenario the improvement in NTMs expands the gains in production, trade and investment for the both economies substantially. The impact on trade flow increases by more than five times. The impact on real GDP also scales up in both countries.

The CGE model used in this paper measures foreign investment on the basis of rental rate of capital which shows the return on capital investment. The amount of investment increases if capital rental return increases in a country. In the case of Pakistan, real investment and rental rate of capital increases in both scenarios though gains are bigger in the second scenario. For Malaysia, the impact on investment is positive both times but the rental rate decreases in the first scenario and increases in the second scenario. In comparison, the improvement in the case of Pakistan is high compared with Malaysia, especially in the second scenario.

Impact on real household incomes

The households are divided into 16 types in the Pakistan's SAM 2010–2011. The effect of policy scenarios on the income level of the 16 types of households is provided in Table 11. The effect on all 16 types of households is positive in both policy scenarios but the increase is high in the second scenario. The first simulation makes little impact on household income, and the impact increases considerably in the next scenario. The difference between rural and urban households is similar but in the second scenario the impact is more significant on urban and rural non-farm households. The households directly linked with farm agriculture sector receive a slightly low effect. The trend is also consistent regarding the effect on factor wages. Capital factors gain more than the agriculture. Interestingly the positive impact on different household categories increases in a systematic way as their income level increases with few exceptions. This trend is more obvious in scenario II in the category of rural non-farm households. However, for rural farmers this trend becomes reversed as we move from small farmers to medium famers' quantile.

Impact on inequality

The effect of both policy scenarios on income inequality indices, that is, the Gini coefficient and Hoover index for Pakistan is given in Table 12. The base index indicates that the value of the Gini coefficient is 0.41592 and the value of the Hoover index is 0.31096. In the first policy scenario,

Table 11. Percent changes in Pakistan real household income (ordered from low to high income households).

HH codes	Households description	Scenario I	Scenario II
hhd-rs1	Rural small farmer (quartile 1)	0.051	0.351
hhd-rs234	Rural small farmer (quartile 234)	0.0503	0.349
hhd-rm1	Rural medium + farmer (quartile 1)	0.0505	0.327
hhd-rm234	Rural medium + farmer (quartile 234)	0.0502	0.334
hhd-rl1	Rural landless farmer (quartile 1)	0.0508	0.342
hhd-rl234	Rural landless farmer (quartile 234)	0.0509	0.344
hhd-rw1	Rural farm worker (quartile 1)	0.0524	0.367
Hhd-rw234	Rural farm worker (quartile 234)	0.0517	0.371
hhd-rn1	Rural non-farm (quartile 1)	0.0492	0.362
hhd-rn2	Rural non-farm (quartile 2)	0.0496	0.363
hhd-rn3	Rural non-farm (quartile 3)	0.0495	0.362
hhd-rn4	Rural non-farm (quartile 4)	0.0499	0.363
hhd-u1	Urban (quartile 1)	0.0508	0.366
hhd-u2	Urban (quartile 2)	0.0503	0.368
hhd-u3	Urban (quartile 3)	0.0506	0.369
Hhd-u4	Urban (quartile 4)	0.0505	0.372

HH: Household.

Table 12. Inequality effect in Pakistan.

Scenarios	Gini index	Hoover index
Base index	0.4159264	0.3109652
Scenario I	0.4159263	0.3109651
Scenario II	0.4159371	0.3109695

both inequality measures, that is, the Gini coefficient and the Hoover index have decreased slightly. In the second scenario, both measures have increased trivially which shows increase in income inequality. The main finding shows that the gap between poor and rich has widened.

Conclusion and policy recommendation

This study has evaluated the Pakistan–Malaysia bilateral tariff settings under different scenarios involving potential FTA tariff structures and an extension scenario involving removal of non-tariff barriers.

The RTAs signed by Pakistan have not helped Pakistan in achieving its trade targets. The Pakistan–Malaysia FTA came with exclusive concession but the impact on the trade sector has not been satisfactory in the immediate years after this FTA. Pakistan exports and imports did not increase with the same pace thus the trade balance remained heavily in favor of Malaysia till 2011. Afterwards, the imports from Malaysia decreased and Pakistan exports increased modestly. However, the trade balance remained negative for Pakistan.

The results significantly differ between the scenarios for both countries. The impact on both economies is positive in the first and second scenarios. The most significant effect on GDP comes in the latter scenario. The trade sector receives a more significant impact in the second

scenario. The output sector gains in all scenarios for both economies, with larger gains in the case of Pakistan compared with Malaysia. The household income gains more in the second scenario compared with the first scenario. The removal of Non Tariff Barriers (NTBs) effect on the real GDP and output are the most significant. The effect in the post-FTA scenario indicates gains for both the economies.

The positive impact on different household categories increases in a systematic way as their income level increases with few exceptions. The inequality study indicates that Gini inequality decreases in the first scenario and increases slightly in last scenario. The Hoover index also shows a similar result. The significant position is that inequality decreases in the post-FTA scenario. The study recommends the extension of the current Pakistan–Malaysia FTA because such a move would result in gains for both the economies.

The study suggests some directions for future research. It would be useful to spend more time, effort and resources into developing an inclusive database for a more recent base year. Furthermore, the database should include some of the key features, for instance, regional level industry and macro data – regional input–output tables, industry-level capital stocks data and time series forecasts for different exogenous variables in the present model. It is ideal to enlarge the Pak-GTAP to include features, such as regional extensions in tracking regional disparities, recursive dynamics in making conditional forecasts, and to include features of imperfect competition in some of the markets, in order to better capture the ground realities in Pakistan's markets. Introducing an imperfection feature of markets will ensure more realistic simulation results with respect to trade liberalization, inequality and poverty linkage, predominantly in terms of implications in the long run within the Pakistan context.

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Author biographies

Muhammd Aamir Khan is Assistant Professor at Department of Economics , COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan. Mr. Khan is also affiliated with WTO Chair Program, Department of Natural Resource Economics, Sultan Qaboos University, Muscat, Oman. Address : COMSATS Institute of Information Technology (CIIT), Park Road, Tarlai Kalan, Islamabad 45550, Pakistan (m.aamir.khan@comsats.edu.pk)

Qaisar Mahmood is a Graduate Student of Department of Management Sciences, COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan. Address: COMSATS Institute of Information Technology (CIIT), Park Road, Tarlai Kalan, Islamabad 45550, Pakistan

Muhammad Zakaria is Assistant Professor at Department of Economics , COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan. Address: COMSATS Institute of Information Technology (CIIT), Park Road, Tarlai Kalan, Islamabad 45550, Pakistan (mzakaria80@hotmail.com)

Muhammad Iftikhar ul Husnain is Assistant Professor at Department of Economics , COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan. Address: COMSATS Institute of Information Technology (CIIT), Park Road, Tarlai Kalan, Islamabad 45550, Pakistan (iftikharhusnain@comsats.edu.pk)

Appendix

Table A.1 Regional aggregation.

Region	Description
Pakistan	Pakistan
Malaysia	Malaysia
China	China
India	India
USA	USA
Bangladesh	Bangladesh
Sri Lanka	Sri Lanka
Indonesia	Indonesia
Singapore	Singapore
Thailand	Thailand
Turkey	Turkey
Australia	Australia
New Zealand	New Zealand
Japan	Japan
Korea	Korea
Chile	Chile
Canada	Canada
Peru	Peru
Iran	Iran
Brunei Darussalam	Brunei Darussalam
S. Arab	Saudi Arabia
UAE	United Arab Emirates
Vietnam	Vietnam
Mexico	Mexico
Egypt	Egypt
Rest of S. Asian	Rest of South Asia
Europe 27	Austria, Belgium, Cyprus, Czech Rep, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Norway, Rest of EFTA, Turkey, Albania, Bulgaria, Belarus, Croatia, Romania, Ukraine, Rest of Eastern Europe, Rest of Europe
Rest of Asia	Hong Kong, Taiwan, Rest of East Asia, Cambodia, Lao People's Democratic Republic, Philippines, Rest of Southeast Asia
Rest of world	Morocco, Tunisia, Bahrain, Argentina, Colombia, Ecuador, Paraguay, Uruguay, Venezuela, Rest of South America, Cost Rica, Guatemala, Nicaragua, Panama, Rest of Central America, Caribbean, Israel, Kuwait, Oman, Qatar, Rest of North Africa, Cameroon, Cote d'Ivoire, Ghana, Nigeria, Senegal, Rest of Western Africa, Central Africa, South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Tanzania, Uganda, Zambia, Zimbabwe, Rest of Eastern Africa, Botswana, Namibia, South Africa, Rest of South Africa Customs Union, Rest of North America, Rest of the World

Source: GTAP 9a Database.

EFTA: European Free Trade Association.

Table A.2 Sectoral aggregation.

Sector description	Comprising GTAP sectors (code)	Sector description	Comprising GTAP sectors (code)
Paddy rice	Pdr	Wearing apparel	Wap
Wheat	Wht	Textile	Tex
Cereals	Gro	Wood products	Lum
Oil seeds	Osd	Paper products, publishing	Ppp
Sugar cane and beet	C_B	Metal products	Fmp
Plant based fibers	Pfb	Motor vehicle and transport	Mvhn, Otn
Crops	Ocr	Manufacture and machinery	Ome, Omf
Processed rice	Pcr	Petroleum, coal products	P_C
Vegetable and fruit	V_F	Chemical, rubber, plastic prods	Crp
Livestock	Ctl, Oap, Rmk, Cmt, Omt	Mineral products	Nmm
Wool	Wol	Ferrous metals	I_S
Forest	Frs	Metals	Nfm
Fishery	Fsh	Electronic equipment	Ele
Coal	Coa	Gas manufacture & distribution	Gdt
Oil	Oil	Water	Wtr
Gas	Gas	Electricity	Ely
Minerals	Omn	Construction	Cns
Vegetable oils	Vol	Trade and transport	Trd, Otp, Wtp, Atp, Cmn
Milk	Mil	Financial services	Ofi, Isr
Sugar	Sgr	Public services	Osg
Processed food	Ofd	Business services	Obs
Beverages and tobacco	B_T	Reactionary services	Ros
Leather	Lea	Other services	Dwe

Source: GTAP 9a Database.

GTAP: Global Trade Analysis Project.