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Hasanat Shah, Syed and Hasnat, Hafsa and li, Junjiang

Jilin university, China

2010

Pre and Post WTO Analysis of South Asian Economies: Evidence from Panel Data Estimation

Syed Hasanat Shah

State Bank of Pakistan

hasnaatsyed@yahoo.com

Hafsa Hasnat

Research Fellow, Jilin University,

2699, Qian Jin Da Jie, Changchun, P. R. China.

hafsa.hasnat@yahoo.com

Dr. Li Jun Jiang

[c]Dean, School of Economics, Jilin University,

2699, Qian Jin Da Jie, Changchun, P. R. China.

lijj@jlu.edu.cn

Abstract

By using statistical tools and panel data estimation techniques, this paper examines the impact of WTO (World Trade Organization) on growth, trade and FDI in South Asia. Statistical analysis supports that exports from and imports and FDI inflows to South Asian economies increased significantly after joining the WTO. However, panel data estimation shows that under the WTO regime, the imports and exports contribution to GDP in the region increased, while the role of FDI remained insignificant.

Key words: trade, FDI, growth, panel estimation

Jel Classification: F13, F21

1. INTRODUCTION:

The WTO, a multilateral trading system, has two main tasks; managing rules to guide world trade and providing platform for negotiation, formalization and implementation

of binding and non-binding agreements ratified by member states. Using the WTO platform, member states bridge the gap on important trade issues like tariff and non-tariff trade barriers through MFN (Most Favored Nation), DSM (Dispute Settlement Mechanism) etc. and helps standardize rules and procedures in dealing candidly with trade related issues. For joining the WTO, member states introduced a number of reforms in order to keep pace with the new trade regime and changing political and economic imperatives. It is considered that joining the WTO and introduction of required reforms increased output, trade, investment and trust across the borders and thus contributed to the overall development of member states.

Knowing that openness to exports and imports contributes to economic development (Bhagwati, 1978); a number of countries liberalized trade and payments regimes by early 1990's and joined the WTO after the mid 90's to integrate to the world economy and seek development. Empirical studies support that WTO significantly enhanced world trade and has contributed much to the development of Globalization (Tomz, 2007). However, this trade promoting role of WTO is uneven (Subramanian and Wei, 2006). It is believed that the WTO forum is manipulated by rich and developed countries, whereas the rest of its members are given the role of menial subservient pawns. Similarly, 'one size fits all' modality under the WTO did not produce satisfactory results, particularly for underdeveloped regions and countries (Steinberg, 2004). Resultantly, the possibility of general welfare loss for individual member states and possibly even for the world economy increased (Rose, 2004).

This provides ground for underdeveloped countries to allege that rules and institutional changes under the WTO are a hatched deal struck by industrialized countries to capture most of the net benefits from international trade. Such allegations provoke vigorous debate on the effectiveness of the WTO and any reforms under such system.

The role of the WTO is also criticized for ignoring issues of small trade partners that lingers for years without any possible consensus in sight. As a result, developing world pay a huge cost. One such example is the yet to be concluded Doha round of negotiations, which is a threat to the whole concept of free and fair trade.

1.1 Background of Research

In terms of population, South Asia is a huge market, with a habitation of 23% of the world's population[1]; however, its share in world trade is little more than 2.5 percent and its contribution to world GDP is a mere 3 percent. Like rest of the member states, India, Pakistan, Bangladesh, Nepal, Sri Lanka and even Maldives introduced wide spread reforms to join WTO in expectation to get easy access to international markets, boost exports and attract foreign investment.

However, it is worth noting that easy access to the international market and increase in exports and development has no linear relation. Similarly, WTO does not guarantee rapid inflows and positive spill over of FDI. Joining the WTO helped many countries to introduce reforms. But for the most optimal impact, reforms needed to be carried out throughout the value chain.

Joining WTO can be detrimental until a country or region is not completely prepared. Similarly, half baked reforms can back fire and the cost of implementing the WTO rules can out weigh its benefits (Low, 2004, World Bank, 2002, 2004). According to Evenett (2005), few papers have been written on WTO accession's impact on economic performance or social well-being in developing countries. Therefore, in the absence of a valid quantitative analysis of joining WTO and reform effectiveness in South Asian economies; this paper is an attempt to analyze if there is any difference between trade, foreign investment and growth before and after joining the WTO in South Asia? If yes, then what is the role of FDI and trade in overall growth of the region under the new trade regime?

[1] Data is collected from the census of respective countries

The rest of the paper is organized as follows: Section 2 discusses literature review, Section 3 deals with methodology and data, Section 4 consists of results and analysis while Section 5 provides conclusion.

2. Literature Review

Rose (2004a, b, and 2005) studied the impact of WTO accessions on the trade of member states and concluded that WTO membership does not affect trade. Subramanian and Wei (2006) using import data rather than total trade data used by Rose (2004) confirmed that imports in developing member countries increased many fold compared to developed members and non member states after joining the WTO. This shows that WTO contribution to trade is significant.

Similarly, other studies support the positive impact of WTO on trade are including Milthorp (1997); Mutti, Sampson, and Yeung (2000). Similarly, Tomz et al. (2007) tried to measure GATT/WTO membership's impact on the level and direction of trade. Their results show that GATT/ WTO contribution to trade depends on proximity and level of national income of member states. In other words GATT had asymmetric effect on trade as confirmed by Gowa and Kim (2005).

Liu (2009) studied the trade promotion as well as trade creation role of the WTO and confirmed that WTO increased trade among the member state by 60 percent while trade among member and non member states increased by 23 percent.

Some studies doubt the role of the WTO in trade liberalization and consider that openness and development is the result of fundamental changes in the domestic economy (Rodriguez and Rodrik 2000; Kenny and Williams, 2001). According to this view, "integration into the world economy" cannot "substitute for a development strategy." Furthermore, after the Asian financial crises, it is argued that globalization, especially hastened by improper order of sequencing, can produce a detrimental effect

on developing countries (Rodrik, 1997; Stiglitz, 2002). The financial crisis of 2008 once again raised such questions.

Chang (2002) considers that all major developed countries used interventionist economic policies in order to get rich and then tried to forbid other countries from doing similarly. The WTO and Bretton Woods institutions receive strong criticism for this kind of ladder-kicking. They are, according to Chang, blocking under developed countries from growing.

Kuang and Wei (2008) studied the value of external commitment to policy reforms in case of WTO/GATT accessions. The accessions often entail reforms that go beyond narrowly defined trade liberalization, and have to overcome fierce resistance in the acceding countries, as reflected in protracted negotiations. The growth and investment consequences of WTO/GATT accessions, with attention to a possible selection bias were observed. The accessions tend to raise income and investment, but only for those countries that were subject to rigorous accession procedures. Policy commitments associated with the accessions were helpful, especially for countries with poor governance.

3. Methodology and Data

In this paper, we use descriptive, statistical and quantitative analysis to analyze the possible effects of joining WTO on South Asian economies. Graphical presentation and mean differences 'T' test will be used in the study to measure the impact of WTO descriptively and statistically. While using panel data techniques, model 1 to 4 are employed for measuring the quantitative impact of joining the WTO.

$$\log GDP_{it} = \gamma_0 + \gamma_1 \log WGDP_t + \gamma_2 \log FDI_{it} + \gamma_3 \log Xpt_{it} + \gamma_4 A + \gamma_5 DXpt + \gamma_6 DFDI + \nu_{it} \quad (1)$$

$$\log GDP_{it} = \delta_0 + \delta_1 \log WGDP_t + \delta_2 \log FDI_{it} + \delta_3 \log Mpt_{it} + \delta_4 A + \delta_5 DMpt + \delta_6 DFDI + \eta_{it} \quad (2)$$

$$\log GDP_{it} = \alpha_0 + \alpha_1 \log WGDP_t + \alpha_2 \log FDI_{it} + \alpha_3 \log Xpt_{it} + \varepsilon_{it} \quad (3)$$

$$\log GDP_{it} = \beta_0 + \beta_1 \log WGDP_t + \beta_2 \log FDI_{it} + \beta_3 \log Mpt_{it} + u_{it} \quad (4)$$

Where 'i' and 't' are indices for countries and time period. GDP_{it} is the gross domestic product of South Asian countries at time t; $WGDP_t$ is the world GDP; Xpt_{it} is the exports of country 'i' at time't'; Mpt_{it} is imports and FDI_{it} is the inflows of Foreign Direct Investment to South Asian countries at time t. All these variables are in million U.S dollars and expressed in log form. 'A' is the dummy for WTO while $DXpt$, $DMpt$ and $DFDI$ are dummies for exports, imports and FDI, respectively. All the dummies take value 0 before joining the WTO and 1 after joining the WTO.

Fixed Effect (FE) and Random-Effects (RE) estimation are the commonly used estimation techniques for pooled data regression. Usually, FE models are preferred in such type of studies because the strict exogeneity assumption is often violated in economic applications leading to biased and inconsistent parameter estimates (Egger, 2005).

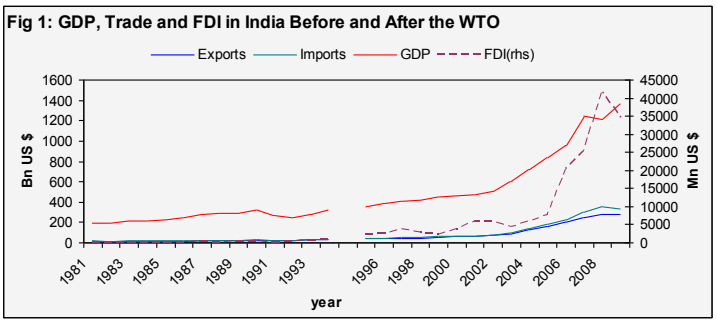
Data on all the variables: Gross Domestic Product (GDP), World GDP, Exports, Imports and Foreign Direct Investment (FDI) for six South Asian countries (i.e. India, Pakistan, Bangladesh, Sri Lanka, Nepal and Maldives) from 19881 to 2010 are collected from the World Bank Development Indicators[2].

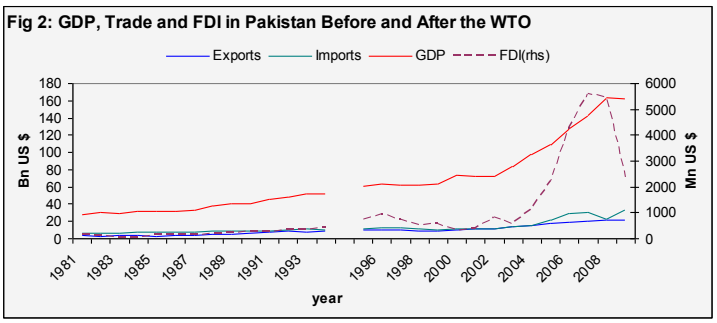
[2] http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?page=1

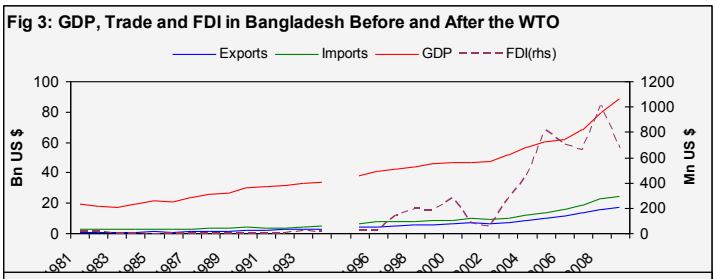
4. Results and Analysis

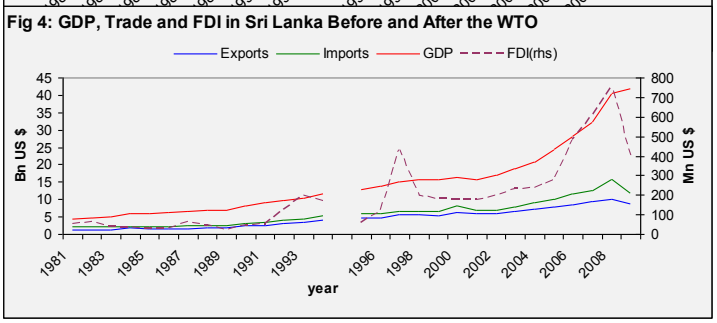
4.1 Graphical Presentations

The graphical representation shows the role of GDP, imports, exports and FDI before and after joining the WTO in India, Pakistan, Bangladesh and Sri-Lanka. It is very obvious from figure 1 to 4 that growth, trade and FDI in the four countries increased significantly, but only after 2000; more than a five years lag after joining the WTO. Perhaps member states used this lag period to get adjusted to the new rules of the game. For further examination we use 'mean differences T test' to verify the role of joining the WTO in South Asian Economies.









4.2 Statistical Tools

Our hypothesis of Mean differences T test is

H_0:

Sample mean of GDP before joining the WTO[3] = Sample mean after joining the WTO

The same hypothesis is repeated for exports, imports and FDI. The results are given in table 1.

Table 1: T test values for Mean Differences

Countries/	**GDP**	**Export**	**Import**	**FDI**
South Asia	6.49 (0.0000)*	-7.01 (0.0000)*	-6.54 (0.0000)*	-7.31 (0.0000)*
India	-4.75 (0.0001)*	-4.14 (0.0003)*	-3.82 (0.0007)*	-2.99 (0.0059)*
Pakistan	-5.54 (0.0000)*	-0.342 (0.7350)†	-4.14 (0.0003)*	-2.99 (0.0060)*
Bangladesh	-7.63 (0.0000)*	-6.62 (0.0000)*	-6.21 (0.0000)*	3.95 (0.0005)*
Sri Lanka	-5.91 (0.0000)*	-9.11 (0.0000)*	-6.91 (0.0000)*	-4.06 (0.0004)*
Nepal	-2.41 (0.0060)*	-4.42 (0.0001)*	-6.62 (0.0000)*	-2.07 (0.0485)*
Maldives	-7.65 (0.0000)*	-8.97 (0.0000)*	-5.18 (0.0000)*	-1.96 (0.0591)**

* Significant at 1 percent level ** significant at 10 percent level †insignificant

The calculated 'p' values strongly reject the null hypothesis of same mean in favor of significant difference between sample means before and after joining the WTO. This shows that the four crucial economic variables i.e. GDP, exports, imports and FDI in South Asian countries, increased substantially after joining the WTO. However, the insignificant T test result for exports from Pakistan shows that the role of WTO in integrating Pakistan to the world economy is insignificant. Overall the 'T'

[3] Except Nepal, other countries joined the WTO in 1995, while Nepal joined the WTO in 2004, so we tested accordingly,

test confirms the positive role of the WTO, but the test has certain limitations. T test is unable to interpret the exact relationship among the variables. Therefore, we rely on the panel data estimation technique to measure the role of WTO in the South Asian region.

4.3 Econometric technique

We pool the data for six South Asian countries. There are three techniques for a pooled time series and cross-sectional dataset: Ordinary Least Squares (OLS), Generalized Least Squares random effects and Generalized Least Squares fixed effects. The choice between OLS, Generalized Least Squares random effects (RE) and Generalized Least Squares fixed effects (FE) techniques is on a conventional Lagrange multiplier (LM) test and the Hausman specification test. Hausman test examine whether the unique errors (ε_{it}) are correlated with the regressors; the null hypothesis is they are not. In our model the small 'p' values of Hausman test shows that FE is more suitable compared to RE model. However, as pointed out by Baltagi (2008) Fixed Effect models are prone to contemporaneous correlation and heteroscedasticity. In case of contemporaneous correlation we use Driscoll and Kraay standard errors as suggested by Hoechle (2007), while for heteroscedasticity we rely on robust FE tests.

The results in Table 2, column 1 show that a one percent increase in world GDP increases South Asian GDP by 0.92 percent. This shows that South Asian economies are deeply integrated to the world economy. The contribution of exports to overall growth is also positive and significant where a one percent increase in exports increases growth by 0.11 percent. Similarly, the dummy for WTO (A) shows that joining the WTO is beneficial for growth in South Asian economies. However, FDI, contrary to expectations, adversely effect growth in South Asia. In column 3 of table 2, the role of world GDP changed in the presence of imports as an independent variable, where a 1 percent increase in world GDP increases South Asian GDP by 0.58 percent. This shows that the contribution of World GDP to South Asia in the presence of

exports is more than in the presence of imports. The impact of joining the WTO on imports in column 3 is also positive and significant. Again, comparing the values of dummy 'A' shows that the role of the WTO is more effective in the presence of exports.

Table: 2 Dependent variable **Gross Domestic Product (GDP)**

Independent Variables	FE robust (1)	RE robust (2)	FE robust (3)	RE robust (4)	FE robust (5)	RE robust (6)	FE robust (7)	RE robust (8)
Intercept	-3.051 (0.000)*	-.1600 (0.838)	-1.761 (0.000)*	0.2757 (0.559)	-3.009 (0.000)*	1.552 (0.130)	-1.371 (0.002)*	0.943 (0.151)
WGDP	0.9250 (0.000)*	0.3627 (0.001)*	0.5821 (0.000)*	0.1154 (0.122)	0.9290 (0.000)*	-0.231 (0.195)	0.490 (0.000)*	-0.266 (0.000)*
FDI	-0.027 (0.032)*	.0037 (0.881)	-0.051 (0.000)*	-0.611 (0.000)*	-0.134 (0.531)**	-0.248 (0.000)*	-0.040 (0.023)*	-0.186 (0.000)*
Xpt	0.1169 (0.000)*	.4737 (0.000)*	-	-	0.0892 (0.012)*	1.3712 (0.000)*	-	-
Mpt	-	-	0.4588 (0.000)*	0.8721 (0.000)*	-	-	0.5531 (0.000)*	1.54 (0.000)*
A	0 .0727 (0.000)*	.0274 (0.443)	0.0488 (0.003)*	0.0135 (0.589)**	0.1234 (0.004)*	0.488 (0.000)*	0.536 (0.165)	-0.221 (0.000)*
DXpt	-	-	-	-	0.0001 (0.013)*	-0.001 (0.000)*	-	-
DFDI	-	-	-	-	-0.032 (0.166)	0.208 (0.000)*	-0.006 (0.751)	0.088 (0.000)*
DMpt	-	-	-	-	-	-	-0.001 (0.011)*	-0.001 (0.000)*
R^2	0.35	0.80	0.78	0.95	0. 20	0.88	0.85	0.98
Hausman	-	0.005	-	0.000	-	0.045	-	0.001

* and ** is significant at 5 and 10 percent level, respectively

To measure the impact of joining the WTO on exports, imports and FDI in South Asia, we introduced exports dummy DXpt, imports dummy DMpt and dummy for FDI i.e. DFDI in column 5 and 7. The results show that exports contribution to GDP increased marginally, while the contribution of imports decreased after joining the WTO. The role of FDI in overall growth remained insignificant.

In table 3 we compared the role of exports, imports and FDI in growth after and before joining the WTO. Comparing the values of exports (Xpt) in column 1 and 3, we can say that export contribution to growth after joining the WTO has significantly increased, while the role of FDI is insignificant. Similarly, after

comparing the results for imports (Mpt) in column 5 and 7, it shows that contribution of imports to growth in South Asia is higher after joining the WTO.

Table 3: Dependent variable **Gross Domestic Product (GDP)**

independent variables	Before Joining WTO		After Joining WTO		Before Joining WTO		After Joining WTO	
Exp. variables	FE robust (1)	RE robust (2)	FE robust (3)	RE robust (4)	FE robust (5)	RE robust (6)	FE robust (7)	RE robust (8)
Intercept	-4.051 (0.000)*	3.231 (0.000)*	-2.361 (0.000)*	-2.085 (0.013)*	-3.009 (0.000)*	-1.112 (0.265)	-0.971 (0.050)*	1.943 (0.005)*
WGDP	1.051 (0.000)*	.8227 (0.000)*	0.8821 (0.000)*	-0.085 (0.583)	0.8290 (0.000)*	0.4852 (0.005)*	0.490 (0.000)*	-0.256 (0.001)*
FDI	0.0050 (0.752)	-0.005 (0.801)	-0.121 (0.540)	0.1061 (0.071)**	0.0024 (0.831)	0.0068 (0.690)	0.0006 (0.923)	-0.002 (0.329)
Xpt	0.2409 (0.000)*	0.3237 (0.000)*	0.333 (0.050)*	0.5501 (0.000)*	-	-	-	-
Mpt	-	-	-	-	0.2892 (0.000)*	0.4712 (0.000)*	0.3531 (0.000)*	1.24 (0.000)*
R^2	0.67	0.83	0.58	0.80	0. 70	0.88	0.85	0.96
Hausman	-	0.015	-	0.000	-	0.000	-	0.001

* and ** is significant at 5 and 10 percent level, respectively

5. Conclusion

In this paper we endeavor to examine the impact of WTO on South Asian economies by observing the role of exports, imports and FDI in overall growth. Based on the statistical evidence, this paper has demonstrated that GDP, export, import and FDI inflows to the region has significantly increased after joining the WTO. Similarly, our econometric techniques support that the contribution of imports and exports to growth increased under the WTO. The direct impact of WTO on growth is also positive and significant. However, the role of FDI after joining the WTO is insignificant and ambiguous, where FDI contribution is positively in the presence of imports and not up to the mark in the presence of exports.

No doubt the impact of WTO is not the same across countries; however, the positive result of WTO effect, in a region where the role of WTO is suspected and vilified a lot, is encouraging. May be the impact of WTO on growth in south Asia is marginal, but

this shows that South Asian economies start utilizing the WTO forum for enhancing trade and development and further integrating to the world economy.

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