

DOES THE WTO MEMBERSHIP ECONOMICALLY MATTER? EVIDENCE FROM SOUTH CAUCASUS ECONOMIES

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ABSTRACT

Motivated by the researches questioning the effectiveness of GATT/WTO, and WTO membership on member country economies, this article studies the impact of joining to this organization on main macroeconomic indicators: economic growth, exports, imports, government and households final consumption expenditures, and net FDI inflow in case of South Caucasus economies for the period 1994-2012. Based on multiply regression model for time-series, and panel data analyses for Georgia, Armenia, and Azerbaijan, the article makes a significant contribution to the existing literature. That is, research findings support the claims that WTO membership affects countries differently, depended on the structure of economies. This belongs to the impact on economic growth, exports, and imports. Nevertheless, WTO does not strongly matter for net FDI inflow. Final consumption expenditures of both governments and households are strongly affected by WTO membership. The membership causes to increasing the government final consumption expenditures and significantly decreasing the household consumption expenditures.

Keywords: WTO membership; Economic growth; International trade; Consumption; FDI; South Caucasus economies.

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Introduction

Since its creation in 1947, the General Agreement on Tariffs and Trade (GATT) has played an important role in the international trading system. This process culminated in the establishment of the World Trade Organization (WTO) in 1995. Since 1947, the GATT/WTO has also grown in its membership from a small set of 23 (mainly developed) countries to a roster that now includes more than 160 countries. Global trade increased exponentially at a rate above the growth rate of merchandise output. It has sponsored eight rounds of trade-policy negotiations that successfully brought down the average tariff rates on industrial goods and also expanded the set of substantive rules governing international trade. Based on the gravity model of trade (hypothesizes that the bilateral trade volume between two countries varies positively with their economic sizes and inversely with their bilateral trade resistance), Rose (2004) conducted parametric estimations and found that the GATT/WTO membership status of a country pair had no statistically significant effect on bilateral trade. This negative finding was partially reversed by Tomz et al. (2007) when they reclassified countries according to their participation status in the GATT/WTO (instead of formal membership), and by Subramanian and Wei (2007) when they differentiated the effects by subsets of the sample (e.g., developed versus developing countries).

Although shedding light on possible caveats to the original study by Rose (2004), these studies and other follow-up research in this literature have largely followed the conventional approach of parametric estimation. The economic theories of trade agreements (e.g., Bagwell and Staiger, (2010,)) suggest that heterogeneous membership effects on trade are important implications, these existing parametric studies are at risk of misspecification bias on both accounts. Following the established gravity theories (Anderson,1979; Bergstrand, 1985; Deardorff, 1998; Anderson and van Wincoop,2003), empirical researchers have come to adopt a long list of variables as proxies for the theoretical concept of trade resistance between a pair of countries. This list typically includes (foremost) geographic characteristics, distance, currency union, language, free trade agreement, and the GATT/WTO membership status. Nevertheless, there is no clear theoretical justification for the linear relation (among the various trade-resistance measures) that is often adopted in the empirical studies.

This research attempts to study the consequences of integration to the WTO in terms of international trade flows and consumption patterns, in case of South Caucasus Economies. For this purpose, the second section reviews the existing literature. While the third section provides information on the theoretical framework, the remaining chapters embodies the empirical methodology specification and interpretation of the results.

1. Theoretical framework

Membership to WTO ensures some advantages such as much more trading opportunities with WTO members, better transparency of policies over the trade, more reliable and "presumable" situation for the trade, rights to benefit from the advantages of agreements within WTO, participation in dispute settlement mechanism of WTO for the purpose to assert their trade rights and national interests and participation rights in multilateral trade negotiations of WTO (Jounela and Tang, 2001), Thus, accession to WTO provides broad range of benefits at least theoretically and that is why, non-member countries try to become a full member of WTO. Although it is a world organization covering most of the world trade, WTO has been always at the interest, and subject to many discussions and

researches in terms of whether it does significantly matter for international trade and economies of the countries or not. This became more popular with Rose's findings (Rose, 2004a) through which he claimed that there is not "strong empirical evidence" to consider that "GATT/WTO has systematically played a strong role in encouraging trade".

More precisely, the researchers that find no significant impact of WTO Rose's findings sparked a growing body of literature (Rose, 2004a, 2004b, 2004c; Gowa and Kim, 2005; Herz and Wagner, 2006; Tomz, Goldstein, and Rivers, 2007; Chang and Lee, 2007; Park, 2009; Eicher and Henn, 2011; Roy, 2011; Swinnen, Olper and Vandemoortele, 2012) are discussed as parallel to the studies of the supporters of WTO (Subramanian and Wei, 2007; Tomz, Goldstein and Rivers, 2007a, 2007b ; Buthe and Milner, 2008; Mansfield and Reinhardt, 2008; Kim, 2008; Liu, 2009; Anderson, 2010; Baldwin, 2010; Jansen, 2010 ;Shah, Hasnat and Li, 2010; Konya, Matyas and Harris, 2011 Chang and Lee, 2011; Herzi and Warner, 2011; Engelbrecht and Pearce, 2007; Eicher and Henn, 2009; Grant and Boys, 2012; Dutt, Zandt and Mihov, 2013).

Tomz, Goldstein and Rivers (2007) overturned Rose's (2004a) result by including informal GATT/WTO participation by dependent colonies or provisional members, thereby altering the treatment and control groups by which GATT/WTO membership is judged. A major difference between the Rose (2004a) and Subramanian and Wei (2007) research concerns the inclusion of importer and exporter effects in the regression. McCallum (1995), omitting fixed importer and exporter effects, found a 2200% increase in intra-Canadian trade due to the border with the United States. As others have demonstrated, and as these results will support, including country effects may change the results but more frequently will provide more moderate results and a better estimation of the data (Matyas, 1997, 1998; Egger, 2000, 2002; Feenstra, 2002; Anderson and van Wincoop, 2003). There are significant reasons to believe that utilizing fixed importer and exporter effects better estimates the impact of WTO on trade. It is exceedingly difficult to measure country-specific variables that impact trade, but undoubtedly, a lot of country-specific variables also affect the trade (Pritchett, 1996; Anderson, 1998; Rodriguez and Rodrik, 1999). Second, simply utilizing a gravity model may not correctly estimate key variables (Feenstra, 2002; Anderson and van Wincoop, 2003).

This diversity of results in the empirical WTO literature seems to suggest that econometric specifications or data coding conventions crucially influence the magnitude of WTO trade effects. Policy makers need to understand if and when gains from WTO can be expected while economists seek to resolve whether data sets, coding or empirical specifications drive results.

The first omitted variable bias ensues when econometric specifications include only one average PTA control. This has been the case in previous literature related to WTO with the exception of Rose (2005). Because preferential tariff reductions differ vastly across PTAs, individual PTA trade effects matter. The second omitted variables bias results when general equilibrium trade effects are not properly accounted for by comprehensive multilateral resistance controls as outlined in Anderson and van Wincoop (2003). Subramanian and Wei (2007) suggest that the absence of multilateral resistance controls in Rose (2004, 2005) biased the coefficients represents WTO impact downward. Another potential omitted variable bias encompasses unobserved bilateral heterogeneity. In their illustrative derivation of the gravity model, Baldwin and Taglioni (2006) label the omission of country-pair fixed

effects the “gold medal of classic gravity model mistakes.” The omission of country-pair fixed effects then renders WTO and/or PTA estimates biased upwards. Proxies for the terms-of-trade theory of WTO have been specifically designed to model benefits of WTO membership. The terms-of-trade theory has been expounded in a series of papers by Bagwell and Staiger, who suggest that negotiations through GATT/WTO solve the terms-of trade externality. Following Johnson's (1953-4) optimal tariff/retaliation argument, nations may hesitate to implement unilateral tariff reductions in the absence of WTO. The WTO terms-of-trade theory was substantially support by Bagwell and Staiger (2010) and Broda et al. (2008) in case of smaller datasets. Studying the trade gains from WTO for a panel of 177 countries over 50 years, findings supported the terms-of-trade theory even after controlling the omitted variable biasedness by those we discussed above. Especially, the countries which had proposed substantial tariff reductions incentives during their WTO accession negotiations observe significantly larger and positive WTO trade effects in comparison with other member countries.

Subramanian and Wei (2007) discovers that the impact of GATT/WTO depends on certain actions such as what the country does with its membership, its negotiation partners as well as the products are subject to the negotiations. Thus, the WTO leads to promoting the trade if the special exemptions are taken into consideration which developing countries enjoy these types of exemptions in particular sectors such as textiles from the liberalization of trade. Liu (2009) highlights the sample selection bias in the traditional gravity formulation: many country exhibits no-trade, which the traditional formulation by examining only strictly positive trade flows. Felbermayr and Kohler (2006) also emphasize the decomposition of the expansion of trade into partner-level extensive and intensive margins. Using unidirectional trade data along with exporter and importer fixed effects reveals a statistically significant positive effect of WTO membership on trade volumes. Eicher and Henn (2011) argue the opposite that accounting for multilateral trade resistance terms via time-varying exporter and importer fixed effects suffices to negate WTO trade effects. Even if we believe that the WTO raises trade volumes, there still remains the question of whether the effect of the WTO is through liberalization of trade policies. Rose (2004b) questions the importance of trade liberalization by showing that few, if any, measures of the trade policy correlate significantly with WTO membership. Furthermore, he reports that trade liberalization lags WTO entry by many years and that membership imposes few trade policy changes amongst many members, especially among developing countries who remain closed to trade for years following GATT/WTO membership.

In contrast, Bagwell and Staiger (2001) claim that GATT/WTO is not merely about tariff concessions and rules for tariff policies. Rather, “the central purpose of WTO rules is to create a negotiating forum where member governments can voluntarily exchange market access commitments, with the assurance that the property rights over negotiated market access commitments are secure against unilateral government infringement.” (see Dutt , Mihov, and Zandt, 2013)

Many theoretical researchers have studied the impact of liberalizing the trade such as decreasing fixed and variable costs of trade (Eaton and Kortum, 2002; Melitz, 2003; Bernard et al., 2003; Chaney, 2008). Not surprisingly, a decrease in both fixed and variable costs cause to more increasing the extensive margin in a bilateral export market. Thus, if there is any

hope of distinguishing between reductions in fixed and variable costs, it must be through their effect on the intensive margin. A reduction in fixed costs typically decreases the intensive margin: the increase in entry, without changing the prices, causes to a dilution of the market shares of the incumbent firms, and the average exports per firm is brought down even further by the fact that the entrants are less productive and sell less than the incumbents.

2. Literature Review

There is not a common view on the effectiveness of the WTO among economists, politicians and nationalist people. Supporters of the organization consider that WTO led to liberalizing global trade through decreasing tariffs and removing non-tariff barriers caused to the increasing economic growth tendency. To its critics, the WTO has favored large multinationals and rich countries while ignoring the development concerns of lesser developed countries. Only recently, however, has research focused on the impact of the WTO on trade between countries (Rose, 2004a, hereafter Rose). Rose concludes: "we currently do not have strong empirical evidence that the GATT/WTO has systematically played a strong role in encouraging trade." This conclusion seems at odds with widely held beliefs. Subramanian and Wei (2007, SW hereafter) argue that Rose is incorrect on modeling and methodological grounds. Thus, SW states that the standard gravity model is to be used and the model might be regressed against imports instead of the average value of real trade and should cover fixed importer and exporter effects. As these substantial changes are done, they found that imports rise significantly in developed countries while increasing slightly in developing countries with the effect of GATT/WTO membership. Tomz et al. (2005) stresses the classifications related to WTO membership in Rose (2004a, 2004b) which specifically concerning developing countries, but this fails to address the issue of how trade flows between countries and how is the impact of WTO over trade flows.

Rose conclude with an insignificant finding for general trade because the WTO impacts imports and exports in offsetting ways for many states. Regressing against imports without fixed country effects, it is found that the WTO affects imports and exports distinctly. When utilizing importer and exporter effects, as specified by SW, the difference is less pronounced, but again imports and exports frequently react to WTO membership differently. High-income countries are the only income group to demonstrate a clear rise in both imports and exports across time, methodological specification and changes to the data. Other income groups, as found in SW, have either stagnant or decreasing trade levels. The main conclusion of this research and interpretation to reconcile these conflicting findings is that the WTO affects imports and exports differently, leading to the non-finding when regressing against overall trade. Finally, trade rises significantly between members but fell when only one country of a trading pair is a member.

The WTO requires members to reduce import barriers but there are significant reasons to expect membership to impact exports as well. First, countries join the WTO and negotiate accession based on the knowledge of their comparative advantages and disadvantages. Countries pick winners or industries that they hope to protect but also try to gain access for their competitive and politically connected industries. If countries only relaxed import controls and did not gain greater market access, few would actively pursue membership.

One of the major advantages of the GATT/ WTO system is its dispute resolution mechanism, which permits aggrieved countries to file costly and time-consuming litigation based on substantial evidence that their products are not being accorded their rights under WTO law. Third, states that join the WTO normally have full ability to export to other members while phasing out domestic protection. This allows new members to get the benefits of free trade, while still getting used to the global trading system. Fourth, joining the WTO frequently involves a costly restructuring of domestic economies. In the meantime, Rose's conclusions have been challenged in a number of papers. Tomz et al. (2007) point out that Rose's definition of GATT=WTO membership as *de jure* accession to the GATT=WTO might not be *apropos* symmetric effects of trade agreements on imports and exports.

This aspect is of particular importance since it is unlikely that GATT=WTO affects exports and imports likewise. Using bilateral import flows, Subramanian and Wei (2007) find that GATT/WTO – in general – promotes bilateral trade with a particularly large effect on imports of industrialized countries but a relatively small effect on the imports of developing countries. Imports are higher by 195% if both the industrialized (developing) importer and its partner are GATT=WTO members and by 147 % if only the industrialized (developing) importer participates. As a major shortcoming, they solely use panel data from 1950 to 2000 in 5-year intervals and thus do not utilize the additional information implied by annual data. Furthermore, Subramanian and Wei (2007) also rely on the *de jure* definition of GATT/WTO membership.

Liu (2009) argues that previous studies, like Tomz et al. (2007) or Subramanian and Wei (2007), focus only on the so-called intensive margin of world trade, namely, on existing trade relations. However, GATT/WTO might also have an important trade-promoting effect on the extensive margin of trade, that is, trade creation between countries that did not have trade relations before. Using fixed-effects Poisson quasi-maximum-likelihood (FE-PQML) estimation, and thus accounting for both the intensive and extensive trade margin, Liu (2009) finds that the GATT/WTO generally has a significantly positive effect on bilateral trade of participants. More specifically, GATT/WTO membership fosters trade among members by 60 per cent (21 per cent at the extensive margin and 39 per cent at the intensive margin), while trade between members and nonmembers is increased by 23 per cent (15 per cent at the extensive margin and 8 per cent at the intensive margin).

Since Liu (2009) examines the Probably the best known examples for these agreements are the General Agreement on Tariffs and Trade (GATT), which was first signed by 23 countries in 1947, and its successor the WTO. Even so, in his recent research, Rose (2004c) states that despite of this wishful thinking, conventional consideration and casual empiricism, there is no compelling empirical evidence to support the widely accepted claim that GATT/WTO membership has really promoted the world trade. Nevertheless, the fact that time-after-time existing and acceding countries seems are willing to cover the raising costs of the accession clearly suggests a strong belief that it will promote trade between them (Felbermayr and Kohler, 2007).

3. Data, Estimation Strategy and Econometric Methodology

All employed data in this research has been attained from the World Bank, World Development Indicators Database. Taken yearly data has been measured in “current USD” value of all corresponding years but, converted to real value by the authors through dividing

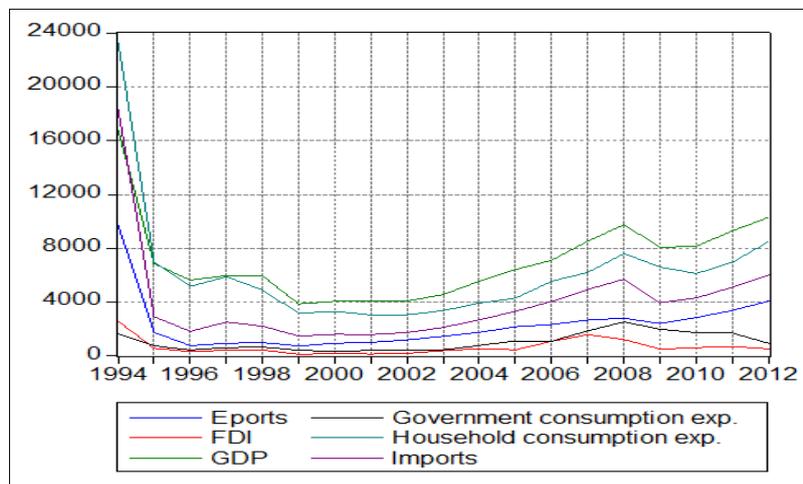
Consumer Price Index (CPI) of each country, taken 2005 as the base year. Only the amount of net Foreign Direct Investments (FDI) inflows in all subject countries was attained as percentage of GDP, and the authors have converted it to the USD amount, by multiplying it with real GDP value for each year. However, missing data issue has made some challenges for the authors. Thus, “net FDI inflow” for Azerbaijan in 1994, for Georgia in 1994, 1995, 1996 was missing. In addition, the value of “general government final consumption expenditure”, “household final consumption expenditure”, “imports of goods and services”, “GDP”, and “exports of goods and services” in 2012 were also missing for Armenia. To solve this problem, authors have used linear extrapolation method in excel, and filled the missing data according to the corresponding trend.

3.1. Data analysis

Before doing empiric estimations, it is useful to do graphical analysis of taken macroeconomic indicators for the countries before and after joining WTO. Georgia has joined to the WTO in 2000. Armenia is a WTO member after 2003. Despite of launching accession negotiations in 1997, Azerbaijan is not accesses to the WTO yet.

By taking 2005 as the base year, real values of the taken macroeconomic indicators have the volatile trend for all countries within 1994-1995. For Georgia, this decreasing trend continues until 1999, and later remains almost the same in the following three years. This is represented in the figure below. After joining to the WTO, in the first two years, not any significant change was observed. Only real exports and imports tend to increase slightly. Georgia has had a high speed increasing trend in real GDP, final household consumption expenditures, and imports.

Figure 1. Georgia before and after WTO membership (base year 2005, millions USD)



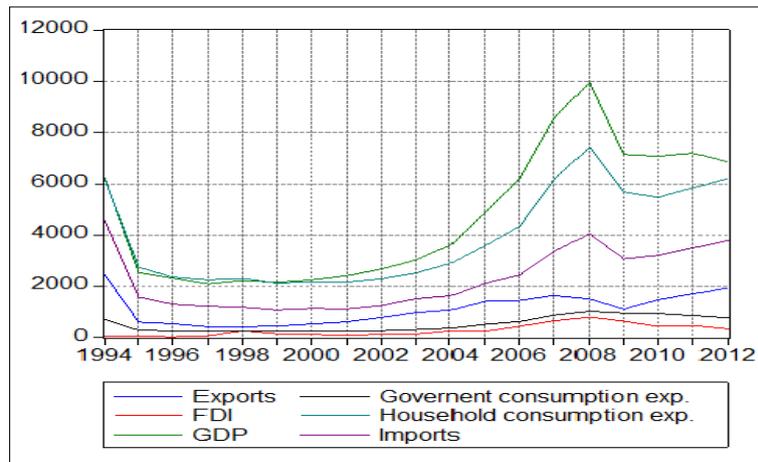
Source: Authors' own creation

However, the increase in amount of real exports is significantly less than the change in amount of imports. Net FDI inflow almost remains the same until 2005. With the end of concession period given for Georgia in 2005, the imports rise sharply. Upward trend continues until 2008 or the world financial crises and sharply fall within 2008-2009. After one year recovering period, all those indicators move upward direction except final government consumption expenditures which decreases, and net FDI inflow which remains almost the same. In before-and-after WTO membership context, it is observed that real

imports and real exports have increased significantly after the accession. Trade deficit observed in all years and imports has increased considerable more than the exports in Georgia, especially after the end of concession period, in 2005.

In the economy of Armenia, after a sharp decline within 1994-1995, stability in all trends were observed until 2002. Following 2002, Armenia's real GDP and final household consumption expenditures have increased continuously until 2008. After Armenia's accession to WTO in 2003, the slope of trend has been considerable high in comparison with previous years in these two indicators. However, the main indicators directly subject to WTO membership - real imports and exports have not been affected seriously. Real imports increased until 2008 but, real exports, in fact, almost was not affected. As a result of 2008 World Financial Crises, all these four indicators go down sharply.

Figure 2. Armenia before and after WTO membership (base year 2005, millions USD)



Source: Authors' own creation

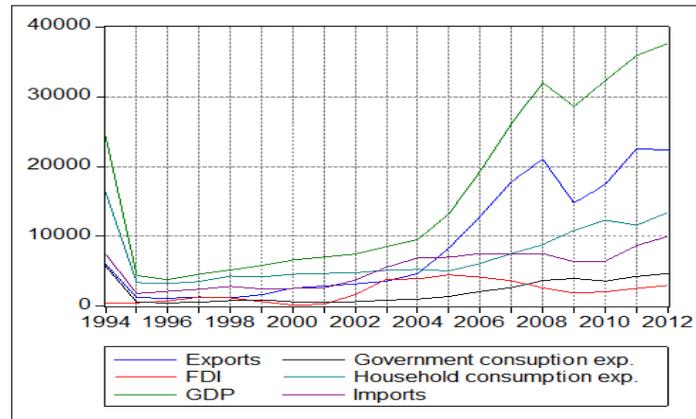
After 2009, real GDP maintains the steady trend until 2011 and decrease again while real final household consumption expenditures, imports and exports continuously increase but, slightly. From the international trade perspective, like Georgia, note that real imports has increased significantly more than real exports in Armenia after the accession to WTO in 2003, especially in the following years after the end of concession period in 2005. Trade gap always became very high after the accession. Remaining two indicators, net FDI inflow and real final government consumption expenditures are not affected significantly by the accession regard to the graphical trends.

Note that Azerbaijan is not a member of the WTO yet despite of long-lasting accession negotiations launched in 1997. However, it is better to look over the trends in a certain group of macroeconomic indicators investigated in this research. The figure below presents trends in Azerbaijan's taken macroeconomic indicators for 1991-2012.

Like Georgia and Armenia, Azerbaijan also observed severe economic decline until 1994, and started restructuring the economy by the IMF supported radical economic policies (Baranick and Salayeva, 2005, p. 213). Moreover, development of oil-and-gas industry also contributed the economy to restructure. That is why all taken macroeconomic indicators observed floating performance until 2005 when the oil boom in Azerbaijan economy started (Aliyev, 2014). In the following years, Azerbaijan economy made a good performance in terms of increase in amount of GDP and exports. In time of World Financial Crisis 2008,

GDP, exports, imports, and net FDI inflow declined while government and household final consumption expenditures continuously increased. In post-crisis period, all these trends tended to increase once more except net and FDI inflow government final consumption expenditures.

Figure3. Azerbaijan’s macroeconomic indicators (base year 2005, millions USD)



Source: Authors' own creation

As mentioned above, all data for the research was achieved in yearly frequency. This research encompasses years within 1994-2012, including both as well. This means 19 observations in time-series analysis for Georgia and Armenia, 38 observations in the panel data analysis consisted of Georgia and Armenia, and 57 observations in the panel data analysis consisted of Georgia, Armenia and Azerbaijan which is not sufficient to run an efficient model. Because quarterly required data for subject countries is unavailable, in order to handle this issue, authors have converted yearly series into quarterly frequency in E-Views 8 Windows-based econometric software, through linear match method.

3.2. Estimation Strategy and Econometric Methodology

Empirical part of this research is consisted of three linear time-series analysis, and two linear panel data analysis. The main variable of interest is “WTO membership” defined as a binary variable which equals one for the WTO membership years of the corresponding countries, separately, and zero for the years before their accession to WTO. In South Caucasus area, there are three countries: Georgia (2000) and Armenia (2003) are already members of the WTO but, Azerbaijan still continues accession negotiations launched in 1997. Therefore, “WTO membership” equals one for Georgia after 2000, for Armenia after 2003, and is always zero for Azerbaijan.

At first stage, Pairwise Granger Causality test is used for “WTO membership” with remaining variables (GDP, import, export, net FDI inflow, government final consumption expenditure, and household final consumption expenditure) in order to define whether “WTO membership” does Granger Cause those variables. At second stage, authors use unit root tests (ADF, ADF Fisher, and Levin-Lin-Chu) are used to define whether used time series data and panel data series are stationary or non-stationary. Later, for non-stationary series of the same level, authors apply Pedroni Residual Cointegration test based on Bayesian information criterion or Schwarz’s Criterion. In regression analysis part, authors apply linear regression model for the series of the same stationary level, and for the series made stationary after first differencing, separately, in both time series and panel data analysis.

In time series regression analysis, authors use HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000) to deal with heteroskedasticity and autocorrelation. In both panel data regression analysis, authors use fixed effects model with for the analysis.

This research reports and interprets 42 separate linear regression equations. Thus, “GDP”, “import”, “export”, “net FDI inflow”, “government final consumption expenditure”, and “households final consumption expenditure”, all in logarithmic functional form have been regressed against the binary variable “WTO membership” and some control variables which include above mentioned variables out of regressand, and once lagged version of the dependent variable. This was done for Armenia with level and first difference data, separately, which means 12 different regressions, and for Georgia only with the stationary data, which means 6 different regressions. Two different panel data analysis, one for Georgia and Armenia, and another one for Georgia, Armenia and Azerbaijan, each have been subject to 6 linear regression estimation with level, and 6 linear regression estimation with first difference data, which means together 24 linear regression equations.

4. Results and Interpretations

4.1. Unit root test results

Here, authors use time series data for the regressions related with Georgia and Armenia, and panel data for the regressions which include Georgia-and-Armenia, and Georgia-Armenia-and-Azerbaijan. To detect unit root problem in the series used for regression analysis, Augmented Dickey–Fuller (ADF), ADF Fisher, and Levin-Lin- Chu test results are reported in following tables.

Table 1. ADF test results for time series variables

Variables	Armenia		Georgia	
	I(0)	I(1)	I(0)	I(1)
GDP	-1.605750	-3.321978**	-2.045329	-4.179769***
EXPORTS	-1.620219	-4.215933***	-3.145199**	-4.519720***
FDI	-1.952600	-2.588845*	-3.292513**	-3.855076***
GOV_CON	-1.648756	-3.395302**	-2.662806*	-2.543634
HOUSE_CON	-1.388108	-3.528734***	-3.799398***	-4.423966***
IMPORTS	-1.392749	-3.993827***	-4.137538***	-4.516450***

Note: *, ** and *** denote significance level of 10%, 5%, and 1% levels, respectively.

Source: Author’s own creation

According to the table 1, all time-series data related to Armenia are non-stationary at level, but stationary at first difference or are I(1). For Armenia, exports, imports and household final consumption expenditures (House_con) are I(1) at 1%, GDP and government final consumption expenditures (Gov_con) are I(1) at 5%, net foreign direct investments inflow (FDI) is I(1) at 10% level of significance. On the other hand, Georgia time-series are I(0) except GDP. Thus, for Georgia, household final consumption expenditures (House_con) and imports are I(0) at 1%, exports and net foreign direct investments inflow (FDI) are I(0) at 5%, and government final consumption expenditures (Gov_con) is I(0) at 10 % level of significance. Georgia’s GDP series is I(1) at 1% level of significance.

Table2. Unit root test results for the panel data variables

VARIABLES	GEO-ARM				GEO-ARM-AZE			
	ADF Fisher		Levin-Lin- Chu t*		ADF Fisher		Levin-Lin- Chu t*	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
GDP	2.18108	38.1572***	0.42502	-4.59048***	2.3226	61.7128***	1.0876	-6.10570***
EXPORT	3.75286	58.3079***	2.26069	-7.89674***	3.9960	68.2300***	1.5563	-7.37170***
IMPORT	7.53589	53.6103***	1.54481	-6.93448***	7.9213	74.9175***	1.6788	-7.70371***
FDI	7.20385	25.3328***	-	-2.36237***	10.497	28.6926***	-1.3488*	-1.82145**
GOV_CON	3.58496	19.3134***	-	-2.17918***	3.9478	49.5484***	-0.1994	-4.95236***
HOUSE_CON	6.11662	45.2062***	1.02068	-5.93416***	6.4655	75.9547***	1.8299	-8.06881***
					6		1	
					2		4	
					5		0	
			0.70406		0			
			0.84357		8			
					9		4	

Note: *, ** and *** denote significance level of 10%, 5%, and 1% levels, respectively.

Source: Author's own creation

For the panel data variables, existence of individual and common unit root process is tested by ADF Fisher and Levin-Lin- Chu tests, respectively. Table represents ADF Fisher and Levin-Lin- Chu test results for both panel data variables. According to the table, all panel data variables consisted of Georgia and Armenia are I(1) in both assumption case – individual unit root assumption (ADF Fisher) and common unit root assumption (Levin-Lin- Chu) at 1% level of significance. Likely, all panel data variables consisted of Georgia, Armenia and Azerbaijan with both unit root case assumption are also I(1) at 1% level of significance, except FDI series. Net FDI inflow with individual unit root assumption is I(1) at 1% level of significance but, indicates weak stationarity with common unit root assumption.

4.2. Causality Analysis

Table 3 provides Granger Causality test outputs for the relationships between dependent variables and WTO membership. The test has been implemented for both the time series models and panel data models based on lag selection 2. In the time series model for Georgia, it is found that WTO membership does Granger Cause only exports and imports. For other variables, we fail to reject the null hypothesis, means that there is not enough evidence to claim WTO membership does Granger Cause GDP, net FDI inflow, final government consumption expenditures, and final household consumption expenditures.

In the time series analysis for Armenia, all outputs derived from Granger Causality test are statistically significant. Granger Causality output of WTO membership on exports is statistically significant at 1% level of significance, and, Granger Causality output of WTO membership on GDP, imports, final government consumption expenditures, and final household consumption expenditures are statistically significant at 5% level of significance, and Granger Causality output of WTO membership on net FDI inflow is statistically significant at 10% level of significance. This means that WTO membership does Granger Cause all endogenous variables taken in the time series model for Armenia.

For the panel data model built with participation of Georgia and Armenia, Granger Causality test produces statistically significant F-statistic values for most of the pairs except

“WTO membership and final government consumption expenditures”. The results imply that in average, WTO membership Granger Cause to GDP (statistically significant at 5% level of significance), exports, imports and final households consumption expenditures (statistically significant at 1% level of significance), and net FDI inflow (statistically significant at 10% level of significance). For the pair “WTO membership and final government consumption expenditures”, rejection of the null hypothesis is failed which implies no evidence to consider WTO membership does Granger Cause to final government consumption expenditures.

Table 3. Pairwise Granger Causality test results

Null Hypothesis	Georgia	Armenia	Panel	
	tau-statistic	z-statistic	GEO-ARM tau-statistic	GEO-ARM-AZE z-statistic
WTO does not Granger Cause GDP	1.25105	4.33634**	4.09969**	0.33032
WTO does not Granger Cause EXPORTS	3.27297**	5.91611***	5.60524***	0.44259
WTO does not Granger Cause IMPORTS	2.84565*	4.36904**	8.22629***	0.29922
WTO does not Granger Cause FDI	0.93712	2.74394*	2.87087*	1.03385
WTO does not Granger Cause GOV_CON	0.42594	3.46315**	1.19244	0.36446
WTO does not Granger Cause HOUSE_CON	1.02232	4.08164**	5.32725***	0.26649

Note: *, ** and *** denote significance level of 10%, 5%, and 1% levels, respectively.

Source: Author’s own creation

After including Azerbaijan also to the panel data, new panel model consisted of Georgia, Armenia and Azerbaijan has also been subject to Granger Causality testing. However, all tau- and z-statistic values have been found as statistically insignificant at all conventionally defined significance levels. Consequently, no evidence is found to say that WTO membership does Granger Cause the endogenous variables (GDP, exports, imports, net FDI inflow, final government consumption expenditures, and final household consumption expenditures) at all conventionally defined levels of significance in average when Azerbaijan is also added to the panel data model. Note that Azerbaijan is not a member of the WTO yet, and the country is rich of resource which have caused to significant growth in those indicators without WTO membership. That may result with insignificant Granger Causality test outputs when Azerbaijan is included into the panel data model in comparison with the panel data model consisted of only Georgia and Armenia.

4.3. Cointegration Analysis

Table 4 represents Pedroni Residual Cointegration test outputs for the variables in time series models for both Georgia and Armenia, referred to tau and z statistic values, and which is based on Bayesian information criterion or with another name, Schwarz Info Criterion. As mentioned above, time series variables in the model for Georgia are I(0) except GDP series. That is why, for Georgia, conintegration test is only applicable for GDP-WTO membership pair.

According to the table above, there is not long-run relationship between GDP and WTO membership in Georgia. Because, both tau-statistic and z-statistic values are statistically insignificant at 10%. Results imply that for Armenia, there is weak cointegration or long-run relationship between GDP and WTO membership. Between exports and WTO membership, existence of cointegration is statistically significant at 5% with both of taken statis-

tical values. Existence of cointegration is also found between net FDI inflow and WTO membership in Armenia, that tau-statistic and z-statistic values are statistically significant at 10% and 1%, respectively.

Table 4. Pedroni residual cointegration test results

WTO Membership and ...	Georgia		Armenia	
	tau-statistic	z-statistic	tau-statistic	z-statistic
GDP	-2.111831	-8.915491	-2.987718	-15.94420*
EXPORTS			-3.850133**	-21.07091**
IMPORTS			-2.676819	-12.48485
FDI			-3.043917*	-57.72135***
GOV_CON			-2.556314	-11.73875
HOUSEHOLD_CON			-2.615259	-12.60015

Note: *, ** and *** denote significance level of 10%, 5%, and 1% levels, respectively. Lag length was chosen based on Schwarz Info Criterion.

Source: Author's own creation

Cointegration test results done for remaining variables and WTO membership pairs is not statistically significant at all. Both tau and z statistic and values are statistically insignificant even at 10%. Therefore, this produces the result of no cointegration or long-run relationship between "imports and WTO membership", "final government consumption expenditure and WTO membership", and "final household consumption expenditure and WTO membership" in Armenia's economy.

Long-run relationship analysis between WTO membership and panel data variables consisted of the data on Georgia and Armenia (GEO-ARM), and Georgia, Armenia and Azerbaijan (GEO-ARM-AZE) are presented in the table below. Here, null hypothesis is tested according to v-statistic, rho-statistic, PP-statistic and ADF-statistic values, separately. In the both panel data analysis, existence of the cointegration is found between WTO membership and exports, imports, net FDI inflow, and final household consumption expenditures which the statistic values are statistically significant for all four at 5% level of significance. This means that there is long-run relationship between "exports and WTO membership", "imports and WTO membership", "net FDI inflow and WTO membership", and "final household consumption expenditures and WTO membership".

For the pair GDP-WTO membership in both panel data analysis, null hypothesis is rejected according to v-statistic, rho-statistic and PP-statistic values at 10%, 5%, and 1%, respectively but, failed to reject according to ADF-statistic value. That is why, considered that long-run relationship between GDP and WTO membership also exists. However, none of the statistic values are statistically significant for the pair "final government consumption expenditures and WTO membership", means that there is not long-run relationship between these two variables in both GEO-ARM, and GEO-ARM-AZE panel data analysis.

Table 5. Pedroni residual cointegration test results for panel data

WTO Membership and ...	GEO-ARM				GEO-ARM-AZE			
	v-Statistic	rho-Statistic	PP-Statistic	ADF-Statistic	v-Statistic	rho-Statistic	PP-Statistic	ADF-Statistic
GDP	1.33453*	-2.1430**	-2.7305***	-1.0791	1.33452*	-2.14303**	-2.73051***	-1.07909
EXPORTS	3.24525***	-4.4638***	-5.4606***	-2.4610***	3.24525***	-4.46387***	-5.46066***	-2.4610***
IMPORTS	2.30307**	-3.0494***	-3.5235***	-2.2859**	3.5009***	-4.7108***	-5.7687***	-3.1745***
FDI	3.5010***	-4.7109***	-5.7687***	-3.1746***	2.30307**	-3.04946***	-3.52355***	-2.2859**
GOV_CON	0.05329	-0.0832	-0.4301	-0.8338	0.05328	-0.08321	-0.4301	-0.8338
HOUSEHOL D_CON	2.738***	-3.9115***	-5.0511***	-2.3415***	2.7383***	-3.9114***	-5.0511***	-2.3415***

Note: *, ** and *** denote significance level of 10%, 5%, and 1% levels, respectively.

Lag length was chosen based on Schwarz Info Criterion.

Source: Author's own creation

4.5. Empirical results

Table 6 represents coefficients of the binary variable “WTO membership” in estimated time-series and panel data models. The first column includes the dependent variables in all regressions which has logarithmic functional form. The second, third, fourth and fifth columns represent the coefficients in time-series models for Georgia and Armenia, and panel data models consisted of Georgia and Armenia (GEO-ARM) and Georgia, Armenia and Azerbaijan (GEO-ARM-AZE), respectively. On the other hand, except the second column, coefficients in the first six rows belong to regression estimations with non-stationary data and remaining six rows are the output of stationary data after differencing once. Because all series out of GDP are stationary at level for Georgia, only six regressions has been estimated for Georgia, all with stationary series, one with differenced once dependent variable.

Time-series analysis: Georgia

According to the estimations, impact of WTO membership over the growth in exports, final government consumption expenditures, and yearly change in GDP growth is positive and statistically significant at 5% level of significance, but over the imports growth, the impact is negative and statistically significant at 5% level of significance. Regression outputs of the time-series models for Georgia implies that, while assuming other factors constant, on average, Georgia’s exports and final government consumption expenditures have grew respectively 10.1% and 6.5% more after its membership to WTO in comparison with the growth in non-membership years. Moreover, positive impact of the WTO membership on yearly change in Georgia’s GDP growth is found. Thus, yearly change in Georgia’s GDP has been 7.3% higher after the accession to WTO than previous years, in average.

However, finding about impact of the WTO membership on imports seem to be a bit strange. So that, the coefficient is negative for the imports means that the growth in Georgia’s imports has been 9.6% less in membership years than the non-membership years. For the remaining ones, the coefficients of both net FDI inflow and final household consumption expenditures are positive but statistically insignificant at 10% level of significance. There is not enough evidence to consider that the impact of WTO membership over net FDI inflow and final household consumption expenditures are statistically significant.

Table 6. Impact of WTO membership

Dependent variables	Georgia	Armenia	Panel data (GEO-ARM)	Panel data (GEO-ARM-AZE)
Log(GDP)		-0.076971***	0.027406**	0.002655
Log(EXPORTS)	0.101228**	-0.047554	0.000446	-0.025365**
Log(IMPORTS)	-0.096086**	0.077566***	0.046688**	0.028964*
Log(FDI)	0.017769	0.0901283	0.038081	0.095387***
Log(GOV_CON)	0.065388**	0.084857***	0.042131**	0.062865***
Log(HOUSE_CON)	0.000765	-0.045323***	-0.041458***	-0.039563***
D(Log(GDP))	0.072822**	0.026310**	0.009544	0.017625***
D(Log(EXPORTS))		-0.042861	-0.006869	-0.011835
D(Log(IMPORTS))		0.004872	0.009740*	0.014196**
D(Log(FDI))		0.073945	0.076699**	0.036983
D(Log(GOV_CON))		0.050939***	0.033710***	-0.000489
D(Log(HOUSE_CON))		0.005657	0.000175	0.001940

Note: *, ** and *** denote significance level of 10%, 5%, and 1% levels, respectively. *t*-statistic values obtained by using heteroscedasticity- and autocorrelation- consistent Newey-West standard errors.

Source: Authors' own creation

Time-series analysis: Armenia

Estimation outputs of the time series models for Armenia are much more discussable. Some of the coefficients are negative and statistically significant, and some are statistically insignificant. According to the table 6 impact of WTO membership over the growth in imports, final government consumption expenditures as well as yearly change in the growth of GDP and final government consumption expenditures are positive and statistically significant at 1% level of significance. In contrast, growth rate in GDP and final household consumption expenditures are negatively affected by the WTO membership, which the coefficients are statistically significant at 1% level of significance. All other coefficients are statistically insignificant.

Results provide that in Armenia, GDP growth has been nearly 7.7% less in average after its accession to WTO in comparison with the growth in pre-membership years. However, it has caused to 2.6% higher growth in Armenia's yearly GDP growth rate. This means that other factors assumed constant, GDP rate has significantly slowdown in Armenia with the impact of WTO membership but, Armenia's yearly GDP growth rate difference has positively affected by the membership. On the other hand, WTO membership has led to 7.8% higher increase in amount of Armenia's imports and 8.5% in amount of final government consumption expenditures while exports are not significantly affected. Moreover, yearly change in final government consumption expenditures is found to be 5.1% higher after the accession to WTO.

Again other factors assumed constant, final household consumption expenditures in Armenia has grew 4.5% with the impact of WTO membership in comparison with non-membership years which means that accession to the WTO has decreasing impact on household consumption expenditures. However, authors fail to find enough evidence to claim that WTO membership has statistically significant impact on exports, yearly change in exports, yearly change in imports and FDI inflow. At the same time, the impact of WTO membership over yearly change in final household final consumption expenditures is positive but statistically and economically insignificant. As an essential point, notice that the impact of WTO membership over both growth and yearly growth change in exports is negative but statistically insignificant for Armenia.

Panel data analysis: Consisted of Georgia and Armenia (GEO-ARM)

Fourth column of the table above represents coefficient of the regression estimations in panel data analysis included Georgia and Armenia. Results indicates that considering these two countries, WTO membership has statistically significant impact over the GDP, imports, final government consumption expenditures, final household consumption expenditures at 5% level of significance as well as yearly change in imports at 10%, net FDI inflow and final government consumption expenditures at 5% level of significance. Remaining coefficients are statistically insignificant at 10% level of significance.

According to the estimation results, in average, and assuming other variables constant, WTO membership leads to approximately 2.7% increase in GDP growth and yearly change in GDP growth, 4.7% increase in amount of imports, 4.2% rise in amount of final government consumption expenditures and 5.1% rise in yearly difference in amount of final government consumption expenditures when Georgia and Armenia are estimated within a panel. However, impact of the WTO membership over final household consumption expenditures is found negative. Thus, the coefficient implies that households' final consumption expenditures has grew around 4.5% less in membership years at WTO in comparison with non-membership years, in average.

Crucial point is that the coefficient represents the impact of WTO membership over growth in exports is positive but statistically and economically insignificant. However, when the WTO membership regressed against yearly change in exports, the coefficient is found negative but, again statistically and economically insignificant. Considering statistically and economically positive impact of WTO membership on exports for Georgia, in this panel data model results, coefficient for the exports seems to be affected by the Armenia's performance. On the other hand, authors fail to find enough evidence once more to consider existence significant impact of WTO membership over net FDI inflow according to the panel consisted of Georgia and Armenia.

Panel data analysis: Consisted of Georgia, Armenia, and Azerbaijan (GEO-ARM-AZE)

As authors mentioned above, this panel data is consisted of Georgia, Armenia and Azerbaijan. Unlike Georgia and Armenia, Azerbaijan is not accessed to the WTO yet despite of long lasting negotiations. That is why, here all values for WTO membership panel variable equals zero for Azerbaijan. The aim here is to predict how taken macroeconomic indicators would be affected by the WTO membership in case of its accession, or more precisely, does the WTO membership matters when consider a non-member country as well.

Last column in the table 6 represents the coefficients from panel data estimations covering Georgia, Armenia and Azerbaijan. According to the results, the impact of WTO membership is statistically significant for exports at 5%, imports at 10%, net FDI inflow, final government consumption expenditures, final household consumption expenditures and yearly change in GDP growth at 1%, and yearly change in imports at 5% level of significance. Other coefficients are all statistically insignificant. Especially, it is found that GDP growth does not differ regard to membership position at WTO because, the coefficient representing the impact of WTO membership over GDP growth is no statistically nor economically significant.

Moreover, those coefficients provides the information that in average, exports has grew 2.5% much more in non-membership years or non-member country that members. Never-

theless, the reason behind sharp increase in Azerbaijan's exports is the result of natural resource production and exporting (Aliyev, 2014) which is out of WTO's sphere of influence, this coefficient is open to further discussions. WTO membership is expected to increase Azerbaijan's imports (2.9%), net FDI inflow (9.5%), final government consumption expenditures (6.23%), yearly change in GDP growth (1.8%) and yearly change in imports (1.4%). In contrast, final household consumption expenditure is expected to decrease nearly 4% in case of membership.

5. Conclusions and Policy Suggestions

In this paper, the impact of WTO membership over the economies of the South Caucasus region countries has been investigated. Note that of region countries, Georgia and Armenia are members of the WTO since 2000 and 2003, respectively, while Azerbaijan did not complete the accession negotiations yet despite of launching the process in 1997. One more key point is that the nonmember country, Azerbaijan, is rich of natural resources, especially oil and gas which consists of the country's industry and exports the most part, and consequently strongly affects the GDP growth performances over the years.

Here, we looked for the difference in international trade patterns (exports and imports) and consumption patterns (household and government final consumption expenditures) as well as FDI net inflow and GDP growth performance before-and-after the WTO membership context. For this purpose, Georgia and Armenia were analyzed separately as time-series analysis, and together within a panel data analysis approach. It is noteworthy to reveal the expected impacts for Azerbaijan economy from providing policy suggestions perspective. That is why we run a regression for panel data including Georgia, Armenia, and Azerbaijan.

The findings are robust and on the same line with findings in Rose (2004a, 2004b) that the impact over international trade may be even negative what we discovered in case of Georgia for imports, and Armenia for exports after joining to the WTO. However, the overall impact on exports and imports is positive when Georgia and Armenia are analyzed in one panel regression. The impact on economic growth also differs for these countries which is negative for Armenia, and positive for Georgia. Nevertheless, the overall impact is again positive in panel regression case. For FDI net inflow, WTO membership positively affects, but the impact is insignificant.

WTO membership matters for government final consumption expenditures as the impact is positive and significant in all cases. However, for household final consumption expenditures, the impact of WTO membership is positive and insignificant for Georgia, negative and significant for Armenia. Despite of this opposite findings, the panel regression output provides existence of negative significant impact for Georgia and Armenia within a panel.

Including Azerbaijan to the panel data analysis together with Georgia and Armenia slightly changes the results. Findings reveals that WTO membership would not significantly matter for economic growth neither statistically nor economically for Azerbaijan economy. The impact over exports is expected to be negative and significant, but considering Azerbaijan's export patterns, this seems not real. Thus, most parts of Azerbaijan's exports are crude oil which is not under the WTO's sphere of influence. However, as mentioned in Aliyev (2014), imports are expected to increase significantly in case of joining to WTO. The good news for Azerbaijan come with WTO membership is increasing significantly the net FDI inflow. As

in other cases, Azerbaijan's final government consumption, and household consumption expenditures is expected to affect significantly, respectively positive for government consumption, and negative for household consumption expenditures.

To sum up, the research reveals that WTO matters but the direction of impact differs across countries, especially for economic growth, and international trade patterns. FDI is not affected strongly by WTO membership. However, WTO membership significantly plays the role in changing consumption patterns, in both government and household final consumption expenditures.

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