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SOUTH-SOUTH TRADE AND NORTH-SOUTH TRADE FOR GROWTH AND PRODUCTIVITY: A CROSS-COUNTRY ANALYSIS FOR THE CIS COUNTRIES‡

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Abstract: This paper examines the impact of trade with various country groupings on both output and total factor productivity growth of Commonwealth of Independent States countries using the trade measures from the Eora multi-region input-output database for 1990-2013 period. Since the growth and productivity effects of various trade measures vary by several country groupings, this study evaluates the model for the developed countries (North), the developing countries (South), the Commonwealth of Independent States countries (South), the Organization of Islamic Countries (South) and the European Union countries (North) sequentially. Regarding the potential of the Commonwealth of Independent States countries for sustainable competition regionally and globally, this analysis is a worthwhile endeavor to guide the policy makers for future trade collaborations. Moreover, since the Commonwealth of Independent States countries are among the South countries, this study mainly enables the comparison of North-South trade with South-South trade and their effects on output and total factor productivity growth. The most significant result of this analysis is that the Commonwealth of Independent States countries gain more from trade with the South countries in terms of positive output and total factor productivity growth. While the exports of Commonwealth of Independent States countries to all country groups have a positive effect, imports from the North countries for the Commonwealth of Independent States have a negative effect on both income and total factor productivity. Estimates of the effects of trade on growth (both exports and imports) are supported by estimates of the effects on total factor productivity, regardless of the econometric forecast method.

Keywords: *CIS countries, North-South trade, South-South trade, growth, total factor productivity.*

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BÜYÜME VE VERİMLİLİK İÇİN GÜNEY-GÜNEY TİCARETİ VE KUZEY-GÜNEY TİCARETİ: BDT ÜLKELERİ İÇİN AMPİRİK BİR ÇALIŞMA‡

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**İlk yazar Türkiye Bilimler Akademisi'nin desteği için teşekkür etmektedir.*

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Öz: Bu çalışmada Bağımsız Devletler Topluluğu'nun çeşitli ülke gruplarıyla yaptığı ticaretin hem ülke geliri hem de toplam faktör verimliliği üzerine etkisi Eora MRIO veri tabanındaki ticaret göstergelerinden faydalanılarak 1990-2013 yılları için tahmin edilmiştir. Çeşitli gelir düzeyindeki ülke gruplarıyla yapılan ticaretin gelir ve verimlilik üzerindeki etkilerinin farklılaşacağını dikkate alan bu çalışma, gelişmiş ülkeler (Kuzey), gelişmekte olan ülkeler (Güney), Bağımsız Devletler Topluluğu ülkeleri (Güney), İslam İşbirliği Teşkilatı ülkeleri (Güney) ve Avrupa Birliği ülkeleri (Kuzey) ile yapılan ticareti sırasıyla modele dahil etmiştir. Bağımsız Devletler Topluluğu ülkelerinin hem bölgede hem de küresel dünyada sürdürülebilir rekabet açısından sahip olduğu potansiyel dikkate alındığında, bu çalışma bir yönüyle ileriye dönük ticari işbirlikleri açısından politika yapıcılara fikir verecektir. Ayrıca, Bağımsız Devletler Topluluğu ülkeleri de Güney ülkeleri grubunda oldukları için, bu çalışma Kuzey-Güney ticaretini ve Güney-Güney ticaretini gelir ve verimlilik etkileri yönüyle kıyaslama imkanı sunmaktadır. Bu çalışmanın en ilginç sonucu Bağımsız Devletler Topluluğu ülkelerinin diğer Güney ülkeleri ile yaptığı ticaretin gelir ve verimlik etkileri yönüyle daha fazla pozitif etkisinin olmasıdır. Bağımsız Devletler Topluluğu ülkelerinin bütün ülke gruplarına yaptığı ihracatın olumlu etkisi varken, Bağımsız Devletler Topluluğu ülkeleri için Kuzey ülkelerinden yaptığı ithalat hem gelir üzerinde hem de toplam faktör verimliliği üzerinde negatif bir etki göstermektedir. Ticaretin büyüme üzerindeki etkileriyle (hem ihracat hem ithalat) ilgili tahminler, ekonometrik tahmin yöntemi fark etmeksizin toplam faktör verimliliği üzerindeki etkilerinin tahminleriyle desteklenmektedir.

Anahtar Sözcükler: *BDT ülkeleri, kuzey-güney ticareti, güney-güney ticareti, büyüme, toplam faktör verimliliği.*

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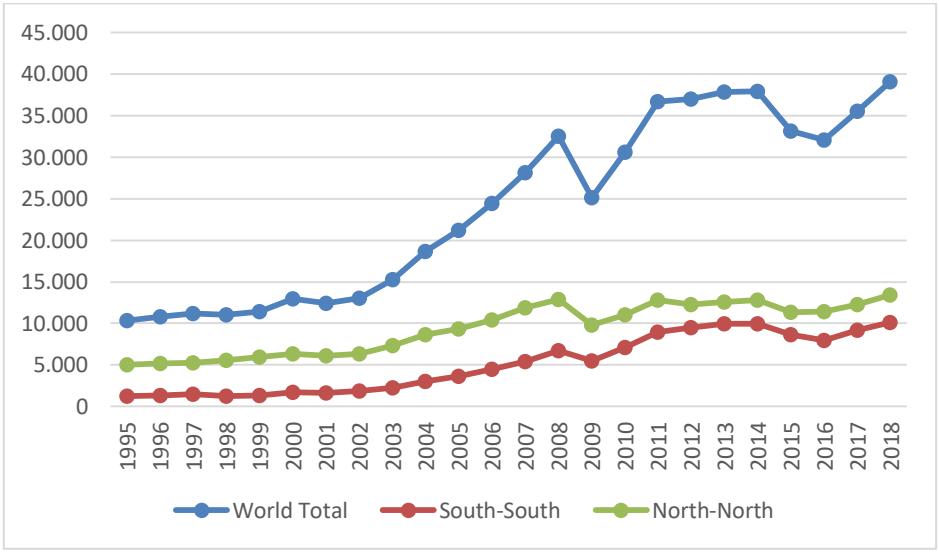
INTRODUCTION

Trade has been attracted huge interest in the empirical growth literature (see, such as Frankel and Romer (1999), Irwin and Terviö (2002), Yanikkaya (2003), and Wacziarg and Welch (2008)). According to Myrdal (1956) and Lewis (1980) South-South trade is the main driver of economic development when regarding the trade among developing countries. They argue that trade among poorer countries reduces their dependency on rich economies and also promotes industrialization by accessing larger markets. During the 1980s, Amsden (1987) and Lall (1987) claim that South-South trade has been increasingly consisted of manufactures over time. United Nations Industrial Development Organization (UNIDO) emphasizes the role of South in world industry and trade that has been increased considerably since the 1980s and its share in world manufacturing output and exports has increased significantly. Thus, the South-South trade cooperation has been immensely increasing (UNIDO, 2006). Recently, United Nations Conference on Trade and Development (UNCTAD) concludes that although the South countries have different levels of resource endowments and economic development, the product composition of South-South trade, by intensely including the manufactured goods, follows a similar pattern with the total trade of developing countries (UNCTAD, 2015). For example, the World Trade Organization (WTO) reports that South-South trade is accounted for the half of the total trade of developing countries in 2016 (WTO, 2018).

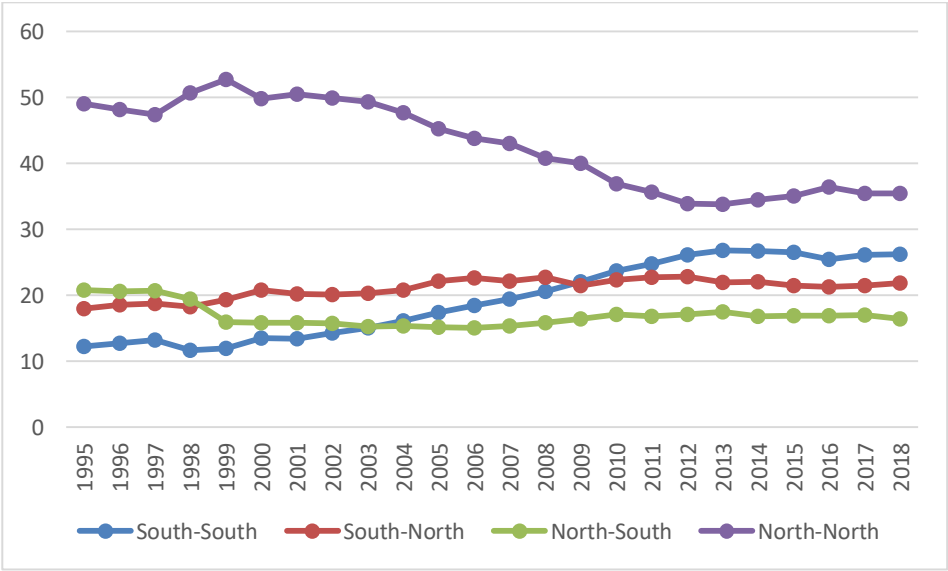
Trade among south countries[1] increases from 1.2 billion USD to 10.1 billion USD between 1995 and 2018. Trade among north countries increases from 5 billion USD to 13.5 billion USD between the similar years. It is clear that south-south trade has increased by a factor of 10 (see Figure 1.). Figure 2 and Figure 3 report the shares of exports and imports in world total by direction, respectively. For both export and import shares, while the share of north-north decreases from approximately %50 to %30 levels, the share of south-south rises from %10 to %25-30 levels.

Figure 1. World Trade (Billions USD)



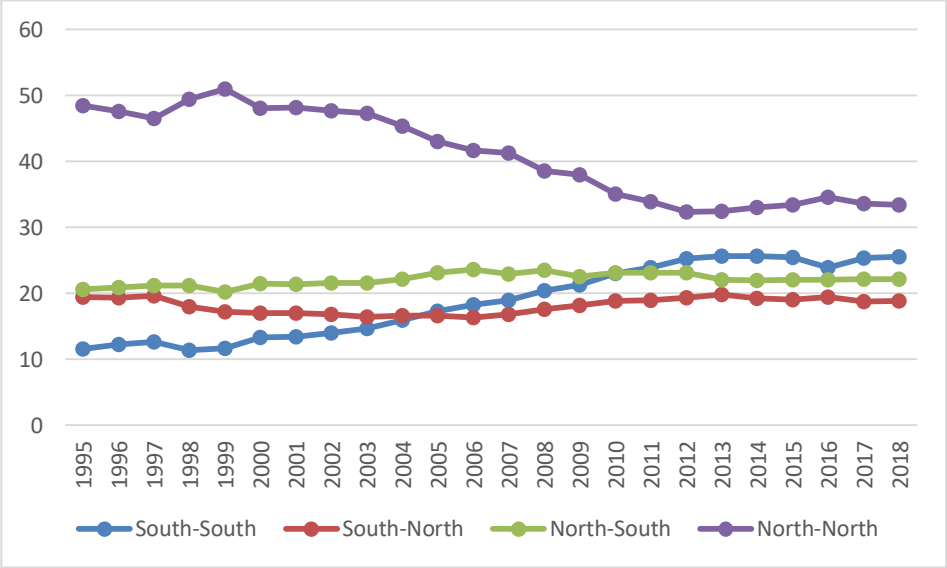
Source: UNCTADSTAT (2019).

Figure 2. Shares of Exports in World Total by Direction (%)



Source: UNCTADSTAT (2019).

Figure 3. Shares of Imports in World Total by Direction (%)



Source: UNCTADSTAT (2019).

Although there are plenty of studies both for developing (the South) and developed countries (the North), we mainly focus on the Commonwealth of Independent States (CIS). Studies differentiating home country and destination country as the South and North are relatively limited when compared with the number of studies directly focusing on the impacts of exports and imports of developing countries. This is probably due the intentional ignorance of the researchers and some international institutions. For example, South-South Cooperation Report notably reminds that "*Once characterized as parochial and irrelevant by conventional Western development analysts, South-South Development Cooperation (also known as SSDC) has evolved from its aspirational origins in the immediate aftermath of decolonization in parts of Asia, Africa, Latin America and the Caribbean, to become a significant engine of development in parts of the emerging South and its development partners."* (South-South Cooperation Report, 2017, 1).

Thus, this paper empirically evaluates the effects of trade with various country groupings on output growth of CIS countries for the years 1990-2013. Various trade specifications for trade shares, imports and exports are employed for this empirical analysis. The most motivating results of this study is that the CIS countries gain the most from trade with the South countries. While exports to all country groupings raise growth, contrary to the expectations, imports from the North countries actually lower growth in the CIS countries. The total factor productivity (TFP) growth is also

employed to check whether trade affects growth through productivity channels. Similarly, the results also provide an important evidence that regarding TFP growth the CIS countries gain the most from trading with the South countries.

Regarding the potential of the CIS countries for sustainable competition regionally and globally, this analysis is a worthwhile endeavor to guide the policy makers for future trade collaborations. Moreover, since the CIS countries are among the South countries, so this study enables to compare North-South trade with South-South trade and their effects on output growth and TFP growth.

Section 2 considers the literature on the impacts of trade on output and TFP growth. Section 3 discusses the data used in the estimations and econometric model. Section 4 shows the estimation results. Section 5 is the conclusion section.

1. LITERATURE REVIEW

This section first reviews the relevant studies for the growth effects of the North and South trade relationships and then continue with the review of empirical growth studies specifically focused on the CIS countries.

Baliamoune-Lutz (2011) reports evidence for the growth by the destination hypothesis. For the years 1995-2008, although she doesn't find an evidence for the significant impact of exports to China on Africa's growth, she finds a strong evidence for the positive impact of exporting to Organization for Economic Co-operation and Development (OECD) countries on African growth. Moreover, interestingly, Chinese share in a country's total imports has a positive impact on growth. Kaya and Huseyni (2015) report that Turkey's exports (as a South country), to the Near and Middle East (South) has less impact on output growth compared to Turkey's exports to the European Union (North) between the years 1980 and 2012. In their study, regarding the role of the Northern final demand in the growth of East-Asia centered production networks, Athukorala and Nasir (2012) conclude that South-South and South-North trade are complementary to each other. Gilbert *et al*. (2015) show that trade liberalization in terms of North-South may lower welfare in the South in some circumstances. A higher level of agricultural output and decrease in the number of locally made manufacturing varieties in a Southern country (both intra and inter industry trade are available) result in a decrease in average wages paid to workers in Southern country. Recently, Mullings and Mahabir (2018) investigate the impact of trade liberalization on the output growth with the bilateral trade data of each African country with the US, the EU, China, and the rest of the world over the period 1990-2009. According to their results, the significantly positive estimated coefficients are usually related with Africa's bilateral trade with China.

A number of papers also empirically investigate the impact of trade on growth regarding the productivity and factor accumulation channels separately. According to the study of Van de Klundert and Smulders (1996), the low share of South countries in the world high-tech product markets prevents them from catching-up the North countries. Thus, the South cannot be able to benefit significantly from productivity spillovers. Also, they refer this situation as a cause for divergence in productivity levels between the North and the South. Afonso and Alves (2008) build a dynamic CGE model for analyzing the technological spillovers from North to South. One of their main results is that both trade in intermediate goods and final goods contribute to the convergence of the productivity levels of countries. Trade in intermediate goods decreases the productivity differences driven by the differences of the available knowledge level. Moreover, trade in final goods contributes to close the productivity gap driven by the mismatch between technological knowledge and skills. Schiff and Wang (2008) show the positive impact of research and development, related with both for North-South and South-South trade directions, on TFP growth of 24 developing countries. Their sample consists of 16 manufacturing industries for these countries for the years 1976-1998. One of their main findings is also the role of the education level for the North-South trade-related technology diffusion (not valid for South-South case). Hazarika and Otero (2011) analyze the effect of North American Free Trade Agreement (NAFTA) on returns to skills in Mexico by using the rates of return to schooling as proxy for the returns to skill. Their suggestion is that the returns to skills in the South declines by the trade with North, thus this has adverse impact on output growth.

Numerous studies specifically examine the growth effects of trade for the CIS countries. After the breakup of the Soviet Union, Michalopoulos and Tarr (1997) analyze the economic implications of potential customs union among these countries and conclude that this union would lead to welfare losses. Freinkman *et al*. (2004) analyze the trade and growth nexus for the CIS countries for the years between 1994 and 2001 by categorizing CIS trade into subgroups such as trade with the CIS, East Asia, Latin America, the OECD and Sub Saharan Africa. Although they do not find any significant results for trade with the Sub Saharan Africa on the growth of CIS countries, they estimate significantly positive results for the CIS and East Asia and significant negative results for Latin America and the OECD. Jenish (2013) estimates the impact of different trade flows such as the intra-regional trade without the Russian Federation, the extra-regional trade and the trade with the Russian Federation on the economic growth of CIS countries for the years between 2000 and 2010. While he does not find any significant impact of the intra-regional trade without the Russian Federation and the extra-regional effect on the growth of CIS countries and he reports the significantly positive impact of trade with the Russian Federation. Tochitskaya and Aksen (2004) analyze the economic effects of Belarus' participation in the CIS countries Customs Union in 1995-2000. They report that the participation in the CIS causes trade diversion

impacts especially in the group of medium and high-tech products for Belarus. Tavadyan *et al.* (2013) investigate the growth effects of participation to the Customs Union of Russia, Belarus and Kazakhstan (CU) and Single Economic Space (SES) and find that after the participation with CU Armenian growth rates would be higher at least by 2 percentage points. They find that after the participation with CU-SES, this growth rate increases will be about 3.2 percent. For a summary of relevant literature, see Table A8.

2. DATA AND METHODOLOGY

The effect of trade is examined with various country groupings on both output and total factor productivity growth of CIS countries using the trade measures from the Eora multi-region input-output database (Eora MRIO) for the years 1990-2013. Considering the common growth literature, the model below is employed in the estimations to examine the growth and productivity effects of large number of trade flow variables.

$$\dot{Xg}_{i,t} = \alpha_0 + \alpha_1 \text{lint}GDP_{i,t-1} + \alpha_2 \text{lcappw}_{i,t} + \alpha_3 \text{llifeexp}_{i,t} + \alpha_4 \text{rlaw}_{i,t} + \alpha_5 \text{PopG}_{i,t} + \alpha_6 \text{trade}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where Xg is the rate of growth of either income per capita or total factor productivity (TFP); lintGDP is the log values of lagged initial per capita income; lcappw is the log values of capital stock per capita; llifeexp is log values of the life expectancy at birth; rlaw is an important governance indicator of countries; PopG is the population growth; trade is several measures of trade (as percentages of GDP). Main data sources for this study are Eora MRIO (see Lenzen *et al.* (2012) and Lenzen *et al*. (2013)), Penn World Table (PWT version 9.0) (Feenstra *et al*, 2015), World Development Indicators (World Bank, 2017) and World Governance Indicators (Kaufmann *et al*., 2011). For summary statistics, see Table 1 and for the data sources and detailed definitions, see Table A7 in the Appendix.

12 CIS countries are included in the sample data set. The sample size for each specification is solely determined by the data availability. The ordinary least squares (OLS) method is used to estimate the basic model. For the sensitivity analysis, fixed-effect estimates are also presented in the Appendix (see Tables A2 to A6)[2].

Table 1. Summary Statistics

Variables	Obs	Mean
Growth rates (%) (**PGDPpcg**)	*284*	*1.568012*
TFP growth rates (%) (**rtfpnag**)	*165*	*.892674*
Initial GDP per capita (log values) (**lintGDP**)	*271*	*8.55633*
Capital Stock per worker (log values) **(lcappw**)	*288*	*10.53353*
Life Expectancy (log values) (**llifeexp**)	*288*	*4.215343*
Rule of Law (**rlaw**)	*288*	*-0.943719*
Population Growth (**PopG**)	*288*	*.4118216*
Total trade of CIS Countries (trade_total_CIS)	*284*	*31.85436*
Trade with developed countries (trade_developed)	*286*	*10.05165*
Trade with developing countries (trade_developing)	*284*	*22.32325*
Trade with other CIS countries (trade_CIS)	*285*	*12.9428*
Trade with the OIC countries(trade_OIC)	*285*	*7.45906*
Trade with the EU countries (trade_EU)	*286*	*8.900356*
Total exports of CIS Countries (export_total_CIS)	*287*	*17.44432*
Export to developed countries (export_developed)	*288*	*4.642968*
Export to developing countries (export_developing)	*287*	*12.78879*
Export to other CIS countries (export_other_CIS)	*288*	*8.310903*
Export to the OIC countries (export_OIC)	*288*	*3.423236*
Export to the EU countries (export_EU)	*288*	*4.297645*
Total imports of CIS Countries (import_total_CIS)	*285*	*14.34194*
Import from developed countries (import_developed)	*286*	*5.403639*
Import from developing countries (import_developing)	*285*	*9.486172*
Import from other CIS countries (import_other_CIS)	*285*	*4.616825*
Import from the OIC countries (import_OIC)	*285*	*4.0368*
Import from the EU countries (import_EU)	*286*	*4.595366*

3. EMPIRICAL RESULTS

This study examines the model presented above for the CIS countries for a sample period of 1990-2013. Since the growth and productivity effects of various trade flows vary by several country groupings, it also estimates the model for developed countries (the North), developing countries (the South), the CIS countries (South), the Organization of Islamic Countries (OIC, South) and the European Union countries (EU, North) sequentially. The specifications consider the following factors of economic growth: the log values of initial GDP per capita for the convergence, the log values of the capital stock per worker for the physical capital stock; the log values of - life expectancy for the human capital; the rule of law index for institutional quality; the rate

of population growth; and a large number of trade flows (exports and imports as well) as percentages of GDP for trade openness.

3.1. Income Growth Estimations

Table 2 reports the OLS results for various measures of trade flows. The insignificantly estimated coefficients on initial GDP per capita show that there is no convergence among the CIS countries. Our estimation results on several control variables also show that none of the control variables has any significant effects on the growth of CIS countries. However, the fixed effects estimates show that there exists a convergence among the CIS countries and higher levels of physical and human capital stocks raise growth in the CIS countries.

The statistically significant and positive estimated coefficient (the column 1 of Table 2) on total trade flows for the CIS countries show that trade openness, as measured by total trade flows, promotes growth. Regarding various trade flows, this paper also employs five more different country groupings, as discussed above. The significantly positive estimated coefficients on developing countries, CIS countries, and OIC countries clearly imply that the CIS countries gain more from trading with the South countries compared with the North countries such as developed countries and the EU countries, which has the insignificantly estimated coefficients.

Table 2. Growth Effects of Trade Flows for CIS Countries: OLS Results

	Trade total CIS	trade developed	Trade developing	trade CIS	Trade OIC	Trade EU
Initial GDP per capita level	*-0.293* *(0.624)*	*-0.381* *(0.517)*	*-0.084* *(0.885)*	*-0.181* *(0.722)*	*-0.254* *(0.690)*	*-0.375* *(0.520)*
Capital stock per worker	*0.601* *(0.493)*	*0.847* *(0.226)*	*0.465* *(0.580)*	*0.531* *(0.502)*	*0.989* *(0.262)*	*0.934* *(0.196)*
Life expectancy	*44.294* *(0.150)*	*40.738* *(0.182)*	*41.231* *(0.182)*	*39.455* *(0.198)*	*41.645* *(0.192)*	*41.719* *(0.170)*
Rule of law	*3.077* *(0.438)*	*2.679* *(0.484)*	*3.279* *(0.394)*	*3.236* *(0.403)*	*3.381* *(0.386)*	*2.692* *(0.482)*
Population growth	*-0.027* *(0.974)*	*-0.080* *(0.917)*	*-0.169* *(0.842)*	*-0.143* *(0.863)*	*-0.276* *(0.749)*	*-0.079* *(0.918)*
Trade Measures	*0.067*** *(0.034)*	*-0.069* *(0.278)*	*0.086*** *(0.034)*	*0.093** *(0.067)*	*0.187*** *(0.030)*	*-0.067* *(0.294)*
Constant	*-187.824* *(0.159)*	*-172.188* *(0.186)*	*-174.796* *(0.191)*	*-166.470* *(0.208)*	*-179.918* *(0.189)*	*-177.385* *(0.172)*
Observation	*267*	*269*	*267*	*268*	*268*	*269*

Notes: See Table 1 and the text for the variable definitions. Robust p values are in parenthesis.
*, **, *** indicate significance at 10%, 5% and 1% levels, respectively.

Table 3. and Table 4. report the OLS results for export flows and import flows for the same period, respectively. In Table 3, all estimated coefficients on trade measures are significantly positive, implying that countries with higher levels of exports to both the North and South countries have higher growth rates.

However, estimation results in Table 4. indicate that while imports from the South countries (developing countries, the CIS and the OIC countries) do not have any effect on growth, imports from the North countries (developed countries and the EU countries) lower growth in the CIS countries. These results are parallel with the empirical literature but are contrary to the theoretical expectations because imports from North countries are supposed to contain high technology or much needed inputs for developing countries, they are then expected to raise both income and total factor productivity growth.

Table 3. Growth Effects of Export Flows for CIS countries: OLS Results

	export total CIS	Export developed	Export developing	Export other CIS	Export OIC	Export EU
Initial GDP per capita level	*0.090* *(0.892)*	*-1.747* *(0.215)*	*0.369* *(0.546)*	*0.405* *(0.517)*	*-0.127* *(0.852)*	*-1.711* *(0.217)*
Capital stock per worker	*0.297* *(0.779)*	*1.057* *(0.290)*	*0.315* *(0.732)*	*0.372* *(0.652)*	*1.386* *(0.208)*	*0.765* *(0.476)*
Life expectancy	*43.091* *(0.142)*	*59.152** *(0.083)*	*39.751* *(0.183)*	*39.943* *(0.175)*	*37.430* *(0.224)*	*55.730** *(0.089)*
Rule of law	*2.939* *(0.432)*	*1.907* *(0.652)*	*3.065* *(0.385)*	*3.352* *(0.335)*	*3.069* *(0.405)*	*1.795* *(0.657)*
Population growth	*-0.065* *(0.938)*	*0.591* *(0.556)*	*-0.199* *(0.819)*	*-0.258* *(0.776)*	*-0.237* *(0.779)*	*0.497* *(0.595)*
Trade Measures	*0.199*** *(0.029)*	*0.787** *(0.080)*	*0.190*** *(0.035)*	*0.239** *(0.070)*	*0.481** *(0.077)*	*0.776** *(0.088)*
Constant	*-184.452* *(0.151)*	*-245.880** *(0.091)*	*-171.667* *(0.185)*	*-172.619* *(0.175)*	*-168.097* *(0.201)*	*-228.426* *(0.103)*
Observation	*270*	*271*	*270*	*271*	*271*	*271*

Notes: See Table 2.

Table 4. Growth Effects of Import Flows for CIS countries: OLS Results

	Import total CIS	Import developed	Import developing	Import other CIS	Import OIC	Import EU
Initial GDP per capita level	*-0.536* *(0.371)*	*-0.524* *(0.380)*	*-0.493* *(0.406)*	*-0.535* *(0.363)*	*-0.378* *(0.540)*	*-0.498* *(0.392)*
Capital stock per worker	*0.834* *(0.272)*	*0.692* *(0.313)*	*0.777* *(0.322)*	*0.823* *(0.289)*	*0.833* *(0.271)*	*0.840* *(0.224)*
Life expectancy	*42.294* *(0.167)*	*38.354* *(0.210)*	*43.223* *(0.161)*	*42.096* *(0.167)*	*44.884* *(0.164)*	*39.927* *(0.190)*
Rule of law	*2.713* *(0.483)*	*2.711* *(0.486)*	*3.001* *(0.441)*	*2.730* *(0.488)*	*3.182* *(0.412)*	*2.723* *(0.484)*
Population growth	*-0.002* *(0.997)*	*-0.142* *(0.840)*	*-0.069* *(0.930)*	*-0.008* *(0.991)*	*-0.187* *(0.821)*	*-0.161* *(0.821)*
Trade Measures	*0.003* *(0.963)*	*-0.163*** *(0.001)*	*0.074* *(0.355)*	*0.015* *(0.896)*	*0.201* *(0.108)*	*-0.158*** *(0.000)*
Constant	*-177.950* *(0.177)*	*-159.044* *(0.224)*	*-182.010* *(0.171)*	*-177.024* *(0.176)*	*-190.481* *(0.170)*	*-167.598* *(0.199)*
Observation	*268*	*269*	*268*	*268*	*268*	*269*

Notes: See Table 2.

For the robustness checks, the regressions in Tables 2-4 are re-estimated by using the fixed effects estimations. Tables A1, A2, and A3, shown in the Appendix, report the results for trade, export and import flows, respectively. Estimations in these three tables basically obtain the very similar results. These fixed effects estimations don't in any significant way alter our conclusions on the growth effects of various trade flows for the CIS countries. Similarity between the OLS and the fixed effects estimations indicates that our results are considerably robust to the estimation techniques.

3.2. TFP Growth Estimations

It is well known fact in the literature that overall trade flows can affect output growth of countries in two distinct channels. Trade can benefit growth either through by increasing the level of production factors or by improving the total factor productivity of countries. Since both physical capital and human capital proxies are already included in the regressions, this paper aims to investigate the total factor productivity effect of trade flows for the CIS countries. To be consistent, this paper utilizes the same specifications as in growth estimations to examine productivity effects of trade flows.

Table 5. shows the OLS estimations for productivity effects of trade flows. Our results imply that the CIS countries with lower incomes, higher physical capital stock and better institutions have higher productivity growth. The significantly and positively estimated coefficient on total trade flows imply that trade flows increase total factor productivity in the CIS countries. However, if we further divide trade with the North and South countries, our results clearly indicate that the CIS countries have productivity

gains only from the trade with South countries. Comparing the significances of coefficients in the columns 4-6 of Table 5 also reinforce this conclusion. In other words, contrary to the expectations, trading more with developed countries fails to promote the productivity growth in these countries.

Table 5. Productivity Effects of Trade Flows for CIS countries: OLS Results

	Trade total CIS	Trade developed	Trade developing	Trade CIS	Trade OIC	Trade EU
Initial GDP per capita level	*-2.834** (0.049)*	*-2.262 (0.133)*	*-2.162 (0.109)*	*-2.125 (0.102)*	*-2.918* (0.059)*	*-2.286 (0.119)*
Capital stock per worker	*3.895* (0.059)*	*2.606* (0.081)*	*3.448* (0.066)*	*3.000* (0.061)*	*9.224** (0.019)*	*2.712** (0.045)*
Life expectancy	*5.788 (0.883)*	*32.841 (0.392)*	*5.298 (0.893)*	*12.068 (0.752)*	*-13.515 (0.695)*	*33.830 (0.385)*
Rule of law	*16.341*** (0.008)*	*7.903 (0.184)*	*14.914** (0.014)*	*13.635** (0.031)*	*22.045** (0.013)*	*7.948 (0.172)*
Population growth	*1.085 (0.165)*	*0.863 (0.121)*	*0.690 (0.291)*	*0.655 (0.227)*	*-0.610 (0.270)*	*0.841 (0.141)*
Trade Measures	*0.183** (0.017)*	*-0.038 (0.709)*	*0.191** (0.021)*	*0.220* (0.051)*	*0.961** (0.020)*	*-0.039 (0.689)*
Constant	*-33.874 (0.845)*	*-139.115 (0.389)*	*-31.974 (0.851)*	*-55.671 (0.737)*	*-3.572 (0.980)*	*-144.207 (0.381)*
Observation	*154*	*156*	*154*	*155*	*155*	*156*

Notes: See Table 2.

Table 6. and Table 7. presents the OLS estimations for both export flows and import flows for the same period, respectively. In Table 6., all coefficients on trade flows are significantly positive. These results imply that exports to all groups promote the TFP growth of CIS countries. However, our results in Table 7. imply that while imports from the South countries improve TFP growth, imports from the North countries actually reduce TFP growth in the CIS countries. These significant results on the TFP growth effects of trade are basically along with the results for the output growth effects of trade for the CIS countries.

Table 6. Productivity Effects of Export Flows for CIS countries: OLS Results

	Export total CIS	Export developed	Export developing	Export other CIS	Export OIC	Export EU
Initial GDP per capita level	*-2.540** *(0.072)*	*-6.954**** *(0.006)*	*-1.693* *(0.191)*	*-1.490* *(0.227)*	*-3.801*** *(0.036)*	*-5.730*** *(0.017)*
Capital stock per worker	*3.112** *(0.097)*	*3.862*** *(0.020)*	*2.892** *(0.084)*	*2.612** *(0.062)*	*8.848**** *(0.008)*	*2.417* *(0.206)*
Life expectancy	*13.089* *(0.766)*	*56.685* *(0.174)*	*10.443* *(0.806)*	*16.362* *(0.692)*	*1.378* *(0.973)*	*35.523* *(0.447)*
Rule of law	*15.324**** *(0.004)*	*13.582*** *(0.032)*	*13.797**** *(0.008)*	*12.347*** *(0.021)*	*19.530**** *(0.004)*	*12.310*** *(0.029)*
Population growth	*1.024* *(0.265)*	*2.138** *(0.086)*	*0.799* *(0.277)*	*0.814* *(0.158)*	*-0.251* *(0.719)*	*2.126* *(0.104)*
Trade Measures	*0.313**** *(0.006)*	*1.564*** *(0.010)*	*0.288**** *(0.007)*	*0.289*** *(0.028)*	*1.405**** *(0.004)*	*1.353**** *(0.008)*
Constant	*-59.667* *(0.758)*	*-218.000* *(0.233)*	*-52.439* *(0.777)*	*-75.724* *(0.672)*	*-55.924* *(0.749)*	*-123.210* *(0.547)*
Observation	*155*	*156*	*155*	*156*	*156*	*156*

Notes: See Table 2.

Table 7. Productivity Effects of Import Flows for CIS countries: OLS Results

	Import total CIS	Import developed	Import developing	Import other CIS	Import OIC	Import EU
Initial GDP per capita level	*-2.990*** *(0.038)*	*-2.309* *(0.101)*	*-2.939** *(0.058)*	*-3.469** *(0.081)*	*-1.724* *(0.180)*	*-2.336** *(0.094)*
Capital stock per worker	*4.380*** *(0.040)*	*2.296** *(0.077)*	*4.409*** *(0.047)*	*4.156** *(0.053)*	*6.472*** *(0.027)*	*2.519** *(0.053)*
Life expectancy	*10.136* *(0.790)*	*32.673* *(0.396)*	*9.192* *(0.803)*	*18.118* *(0.611)*	*-3.577* *(0.923)*	*34.079* *(0.371)*
Rule of law	*14.551*** *(0.047)*	*7.530* *(0.163)*	*14.843*** *(0.046)*	*14.084** *(0.060)*	*17.707*** *(0.043)*	*7.655* *(0.156)*
Population growth	*1.095** *(0.075)*	*0.775* *(0.114)*	*0.631* *(0.176)*	*0.515* *(0.166)*	*-0.179* *(0.829)*	*0.737* *(0.140)*
Trade Measures	*0.284** *(0.092)*	*-0.113**** *(0.003)*	*0.407** *(0.082)*	*0.553* *(0.103)*	*1.488** *(0.097)*	*-0.109**** *(0.006)*
Constant	*-55.255* *(0.734)*	*-134.707* *(0.406)*	*-51.238* *(0.746)*	*-81.419* *(0.595)*	*-27.845* *(0.846)*	*-142.766* *(0.373)*
Observation	*155*	*156*	*155*	*155*	*155*	*156*

Notes: See Table 2.

For the sensitivty checks, the variables in Tables 5. to 7. are re-estimated with the fixed effects method. Tables A4, A5, and A6, presented in the Appendix, report the productivity effects for trade, export and import flows, respectively. Estimations in

these three tables are essentially in line with the OLS estimations. Therefore, TFP growth effects of various trade flows do not change our previous conclusions.

Given the relative ignorance of the literature towards South-South trade cooperation, as South-South Cooperation Report (2017) claims, discussed above, the significantly adverse results presented here for the impacts of trade flows from developed countries and the EU countries to CIS countries are the legitimate counter arguments for the superiority of North-South trade over South-South trade both in terms of income growth and TFP growth effects. These interesting results may be caused mainly from the bilateral protectionist policies between the CIS countries and the North countries and from the composition and trade variety of these countries. Given the much higher size of the estimated coefficients on the OIC countries compared to those for others, another important result in our study is the higher effect of trade with the OIC countries on the growth of CIS countries than intra-regional trade of CIS and trade with developing countries. It is worth noting that this result clearly implies the heterogeneous growth effects of South-South trade though.

CONCLUSIONS

This paper first reports the growth effects of a number of trade flow measures for the CIS countries. The estimations results are substantially robust to the changes in sample size and to estimation techniques. The strongest, most consistent results are found for trade with the South countries. The positive effects of trade on growth for the South countries are found for the CIS countries for period considered in the paper. Exports to all country groupings support growth. Interestingly, imports from the North countries reduce growth in the CIS countries, which is contrary to the expectations because developing countries are considered to access better inputs and technologies by importing from developed countries.

This paper then contemplates the impacts of various measures of trade flows on the total factor productivity growth of CIS countries because the productivity channel is the main channel through which trade can support growth. Our results provide very interesting results that the CIS countries gain the most from trading with the South countries. Estimations results for the growth effects of trade (export and import as well) flows are in line with the estimations from TFP growth regardless of the estimation methods. These results can be explained with the comparative advantage argument and with relatively higher terms of trade in trade with those countries. It is worth noting that developing countries including CIS and OIC countries should find more means to improve trade relationships with other developing countries given the strong positive growth and productivity effects.

NOTES

[1] In these three figures, "South" refers to developing countries and transition economies and "North" refers to developed nations.
[2] The highly significant Hausman test statistic indicates that our initial hypothesis that the individual-level effects are reliably modeled by a random-effects model is not accepted.

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APPENDIX: Tables

Table A1. Growth Effects of Trade Flows for CIS countries: FE Results

	trade total CIS	Trade developed	Trade developing	Trade CIS	Trade OIC	Trade EU
Initial GDP per capita level	*-12.213** (0.029)*	*-15.227*** (0.007)*	*-13.135** (0.018)*	*-13.661** (0.013)*	*-13.632** (0.015)*	*-15.114*** (0.007)*
Capital stock per worker	*10.461*** (0.002)*	*11.960*** (0.001)*	*10.852*** (0.003)*	*10.682*** (0.004)*	*11.732*** (0.001)*	*11.947*** (0.001)*
Life expectancy	*211.546** (0.019)*	*224.647*** (0.009)*	*209.746** (0.022)*	*213.009** (0.020)*	*209.761** (0.028)*	*225.853*** (0.009)*
Rule of law	*4.355 (0.318)*	*4.481 (0.348)*	*4.610 (0.296)*	*4.818 (0.285)*	*4.689 (0.308)*	*4.415 (0.350)*
Population growth	*-2.757 (0.338)*	*-2.646 (0.384)*	*-2.762 (0.333)*	*-2.689 (0.356)*	*-2.793 (0.344)*	*-2.594 (0.395)*
Trade Measures	*0.204* (0.092)*	*-0.092 (0.158)*	*0.220 (0.114)*	*0.306* (0.096)*	*0.310 (0.459)*	*-0.071 (0.392)*
Constant	*-897.125*** (0.008)*	*-934.740*** (0.004)*	*-883.899** (0.011)*	*-890.203** (0.010)*	*-886.216** (0.013)*	*-941.027*** (0.004)*
Observation	*267*	*269*	*267*	*268*	*268*	*269*

Notes: See Table 2.

Table A2. Growth Effects of Export Flows for CIS countries: FE Results

	export total CIS	Export developed	Export developing	Export other CIS	Export OIC	Export EU
Initial GDP per capita level	*-8.813* (0.094)*	*-4.820 (0.351)*	*-11.788** (0.030)*	*-12.700** (0.020)*	*-12.043** (0.029)*	*-6.177 (0.199)*
Capital stock per worker	*4.413 (0.183)*	*1.325 (0.571)*	*7.546** (0.047)*	*8.353** (0.018)*	*9.430** (0.022)*	*2.024 (0.309)*
Life expectancy	*205.547** (0.021)*	*207.092*** (0.003)*	*212.494** (0.023)*	*221.798** (0.017)*	*184.390** (0.049)*	*204.636*** (0.003)*
Rule of law	*1.993 (0.601)*	*0.194 (0.960)*	*3.003 (0.455)*	*3.782 (0.367)*	*3.937 (0.413)*	*-0.484 (0.894)*
Population growth	*-2.634 (0.262)*	*-2.919 (0.261)*	*-2.489 (0.322)*	*-2.405 (0.378)*	*-2.550 (0.328)*	*-3.082 (0.222)*
Trade Measures	*0.635*** (0.001)*	*2.398*** (0.000)*	*0.595*** (0.007)*	*0.644** (0.044)*	*1.802*** (0.004)*	*2.584*** (0.000)*
Constant	*-844.345** (0.013)*	*-854.135*** (0.002)*	*-876.709** (0.013)*	*-913.573*** (0.010)*	*-773.495** (0.029)*	*-840.120*** (0.001)*
Observation	*270*	*271*	*270*	*271*	*271*	*271*

Notes: See Table 2.

Table A3. Growth Effects of Import Flows for CIS countries: FE Results

	İmport total CIS	İmport developed	İmport developing	İmport other CIS	İmport OIC	İmport EU
Initial GDP per capita level	*-14.617*** (0.008)*	*-14.620*** (0.008)*	*-14.519*** (0.009)*	*-14.752*** (0.009)*	*-14.884*** (0.008)*	*-14.618*** (0.008)*
Capital stock per worker	*11.413** (0.011)*	*11.275*** (0.002)*	*11.828*** (0.007)*	*12.243*** (0.006)*	*11.271*** (0.008)*	*11.424*** (0.001)*
Life expectancy	*223.959** (0.011)*	*220.512*** (0.010)*	*221.562** (0.015)*	*217.583** (0.017)*	*227.819** (0.014)*	*222.118*** (0.010)*
Rule of law	*4.519 (0.347)*	*4.588 (0.342)*	*4.637 (0.328)*	*4.783 (0.312)*	*4.496 (0.360)*	*4.586 (0.341)*
Population growth	*-2.819 (0.355)*	*-2.876 (0.338)*	*-2.790 (0.360)*	*-2.736 (0.375)*	*-2.804 (0.356)*	*-2.844 (0.345)*
Trade Measures	*-0.042 (0.875)*	*-0.163*** (0.001)*	*0.045 (0.896)*	*0.241 (0.634)*	*-0.245 (0.702)*	*-0.147*** (0.000)*
Constant	*-931.430*** (0.004)*	*-915.134*** (0.005)*	*-927.487*** (0.006)*	*-913.680*** (0.008)*	*-943.537*** (0.006)*	*-923.708*** (0.004)*
Observation	*268*	*269*	*268*	*268*	*268*	*269*

Notes: See Table 2.

Table A4. Productivity Effects of Trade Flows for CIS countries: FE Results

	Trade total CIS	Trade developed	Trade developing	Trade CIS	Trade OIC	Trade EU
Initial GDP per capita level	*-17.896* (0.058)*	*-23.548** (0.015)*	*-19.373** (0.038)*	*-20.333** (0.032)*	*-18.857** (0.035)*	*-23.538** (0.015)*
Capital stock per worker	*5.447 (0.283)*	*6.906 (0.154)*	*5.755 (0.289)*	*5.614 (0.305)*	*8.656* (0.094)*	*6.852 (0.152)*
Life expectancy	*125.525 (0.132)*	*155.177* (0.072)*	*122.980 (0.149)*	*130.720 (0.133)*	*95.621 (0.244)*	*155.599* (0.071)*
Rule of law	*10.261* (0.090)*	*5.819 (0.523)*	*10.309* (0.079)*	*9.856 (0.135)*	*15.796* (0.065)*	*5.642 (0.527)*
Population growth	*4.042** (0.045)*	*5.130** (0.042)*	*4.022** (0.050)*	*4.294** (0.049)*	*3.248 (0.124)*	*5.241** (0.035)*
Trade Measures	*0.303** (0.010)*	*-0.042 (0.333)*	*0.335** (0.023)*	*0.401* (0.085)*	*1.158** (0.027)*	*-0.025 (0.680)*
Constant	*-437.122 (0.141)*	*-522.308* (0.084)*	*-414.400 (0.175)*	*-435.549 (0.159)*	*-329.352 (0.266)*	*-524.013* (0.082)*
Observation	*154*	*156*	*154*	*155*	*155*	*156*

Notes: See Table 2.

Table A5. Productivity Effects of Export Flows for CIS countries: FE Results

	Export total CIS	export developed	Export developing	Export other CIS	export OIC	Export EU
Initial GDP per capita level	*-14.375** *(0.097)*	*-13.094* *(0.129)*	*-17.464*** *(0.050)*	*-19.197*** *(0.042)*	*-17.563*** *(0.036)*	*-15.099** *(0.064)*
Capital stock per worker	*-0.657* *(0.899)*	*-1.687* *(0.494)*	*1.812* *(0.748)*	*2.845* *(0.604)*	*4.793* *(0.347)*	*-1.462* *(0.630)*
Life expectancy	*129.595* *(0.111)*	*153.092*** *(0.035)*	*130.786* *(0.130)*	*140.933* *(0.111)*	*100.883* *(0.214)*	*155.833*** *(0.033)*
Rule of law	*6.975* *(0.203)*	*3.753* *(0.687)*	*7.371* *(0.181)*	*7.108* *(0.300)*	*13.650** *(0.086)*	*1.270* *(0.871)*
Population growth	*3.540** *(0.095)*	*3.728* *(0.141)*	*4.042** *(0.057)*	*4.612*** *(0.049)*	*3.022* *(0.152)*	*3.909** *(0.098)*
Trade Measures	*0.576**** *(0.009)*	*2.017**** *(0.001)*	*0.568*** *(0.039)*	*0.583* *(0.196)*	*2.054*** *(0.031)*	*2.188**** *(0.000)*
Constant	*-422.853* *(0.153)*	*-524.064*** *(0.037)*	*-424.342* *(0.175)*	*-460.751* *(0.143)*	*-323.098* *(0.272)*	*-523.435*** *(0.044)*
Observation	*155*	*156*	*155*	*156*	*156*	*156*

Notes: See Table 2.

Table A6. Productivity Effects of Import Flows for CIS countries: FE Results

	İmport total CIS	İmport developed	İmport developing	İmport other CIS	İmport OIC	İmport EU
Initial GDP per capita level	*-22.642*** *(0.023)*	*-23.018*** *(0.017)*	*-22.959*** *(0.020)*	*-23.719*** *(0.017)*	*-21.656*** *(0.025)*	*-23.060*** *(0.017)*
Capital stock per worker	*9.976** *(0.069)*	*6.730* *(0.162)*	*9.951** *(0.062)*	*9.953** *(0.066)*	*11.045** *(0.066)*	*6.816* *(0.158)*
Life expectancy	*135.006* *(0.115)*	*154.129** *(0.075)*	*124.817* *(0.137)*	*124.836* *(0.131)*	*114.143* *(0.192)*	*154.628** *(0.074)*
Rule of law	*10.211* *(0.169)*	*6.351* *(0.501)*	*11.138* *(0.118)*	*11.422* *(0.120)*	*13.609* *(0.135)*	*6.320* *(0.501)*
Population growth	*5.015*** *(0.028)*	*4.760** *(0.066)*	*4.747*** *(0.036)*	*4.730*** *(0.040)*	*4.210** *(0.082)*	*4.826** *(0.061)*
Trade Measures	*0.389*** *(0.036)*	*-0.085**** *(0.007)*	*0.598*** *(0.017)*	*0.888*** *(0.012)*	*1.649* *(0.109)*	*-0.075**** *(0.009)*
Constant	*-480.379* *(0.110)*	*-519.924** *(0.087)*	*-433.420* *(0.142)*	*-426.004* *(0.142)*	*-408.294* *(0.180)*	*-522.754** *(0.085)*
Observation	*155*	*156*	*155*	*155*	*155*	*156*

Notes: See Table 2.

Table A7. Data Sources

PARAMETERS	EXPLANATIONS	DATA SOURCES
PGDPpcg	Growth rates (%)	World Bank (2017)
Rtfpnag	Growth rates of TFP.	Feenstra *et al*. (2015) Penn World Table 9(0); www.ggdc.net/pwt (Date of Access: 01.03.2017)
lintGDP	Initial GDP per capita from PWT 9.0. We use log values of intGDP in our model.	Feenstra *et al*. (2015) Penn World Table 9(0); www.ggdc.net/pwt (Date of Access: 01.03.2017)
Lcappw	Capital Stock per worker (log values), cappw which is calculated by dividing capital stock (rkna) to employment (emp) (cappw= rkna/emp) from PWT 9.0. We use log of cappw in our model.	Feenstra *et al*. (2015) Penn World Table 9(0); http://www.rug.nl/ggdc/productivity/pwt/ (Date of Access: 01.03.2017)
Llifeexp	Life Expectancy (log values)	World Bank (2017)
Rlaw	"*Rule of Law reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. We used this data from the 2015 update of The Worldwide Governance Indicators which is available for the dates betw. 1996 and 2014*."(From definitions of WGI)	Kaufmann *et al*. (2011) World Governance Indicators, World Bank; http://data.worldbank.org/data-catalog/worldwide-governance-indicators (Date of Access: 05.03.2017)
PopG	Population Growth	World Bank (2017)
Total trade with (exports to or imports from) developed and developing countries, Trade with (exports to or imports from) other CIS countries, Trade with (exports to or imports from) the OIC countries, Trade with (exports to or imports from) the EU countries.	We calculate various trade specifications as % GDP from Eora multi-region input-output (Eora MRIO) database.	Eora MRIO http://www.worldmrio.com/ (see Lenzen *et al*. (2012) and Lenzen *et al*. (2013)) World Bank (2017)

Table A8. Summary of the Relevant Literature

The growth effects of the North and South trade relationships			
Authors	**Direction**	**Period**	**Important Implications**
Baliamoune-Lutz (2011)	South -> South South -> North	1995-2008	• Provides evidence for the growth by destination hypothesis for Africa. • Exporting to China has no positive impact on Africa's growth, • Exports to OECD countries has a positive effect on the growth in Africa. • The share of imports from China has a positive growth impact.
Kaya, Huseyni (2015)	South -> South South -> North	1980-2012	• Turkey's exports (as a South country), to the Near and Middle East (South) has less impact on economic growth compared to Turkey's exports to the European Union (North).
Athukorala, Nasir (2012)	South -> South South -> North	1996-2009	• South-South and South-North trade are complementary to each other.
Gilbert *et al*. (2015)	North-> South	2001-2009	• Trade liberalization in terms of North-South may lower economic welfare in the South in some circumstances.
Mullings, Mahabir (2018)	South-> South South-> North	1990-2009	• Investigate the impact of trade openness of African countries with the trade partners such as China, the EU, the US and the rest of the world. • Estimate significant positive coefficients for the Africa's bilateral trade with China .
The impact of trade on growth regarding the productivity and factor accumulation channels separately			
Authors	**Direction**	**Period**	**Important Implications**
Van de Klundert, Smulders (1996)	North->South	Theoretical Paper	• The low share of South countries in the world high-tech goods market prevents them from catching-up the North countries. Thus, the South cannot be able to benefit significantly from productivity spillovers. • They refer this situation as a cause for divergence in productivity levels between the North and the South.
Afonso, Alves (2008)	North->South	Theoretical Paper	• Build a dynamic general equilibrium model for analyzing the diffusion of technological knowledge from North to South. • One of their main results is that both trade of intermediate goods and final goods contribute to the convergence in productivities of countries. • Trade in intermediate goods decreases the productivity differences driven by the differences of the available technological knowledge level. • Trade in final goods contribute to close the productivity gap driven by the mismatch between technological knowledge and skills.
Schiff, Wang (2008)	North-> South South-> South	1976-1998	• Show the positive impact of research and development, related with both for North-South and South-South trade directions, on TFP growth. • One of their main findings is also the role of the level of education in increasing the North-South trade-related technology diffusion (not valid for South-South case).

Hazarika, Otero (2011)	North-> South	1987&1999	• Conduct their analysis separately for 1987 and 1999. • Analyze the effect of North American Free Trade Agreement (NAFTA) on returns to skills in Mexico by using the rates of return to schooling as proxy for the returns to skill. • Their suggestion is that the returns to skills in the South decreases by the trade with North, thus this has negative impact on economic growth.
Papers specifically examine the growth effects of trade for the CIS countries			
Authors	**Direction**	**Period**	**Important Implications**
Michalopoulos, Tarr (1997)	South->South	1991-1995	• For the post Soviet Union era, they analyze the economic implications of potential customs union among these countries and conclude that this union would lead to welfare losses.
Freinkman *et al*. (2004	South->South North->South	1994-2001	• Analyze the trade and growth nexus for the CIS countries by categorizing CIS trade into subgroups such as trade with the OECD, CIS, East Asia, Latin America, and Sub Saharan Africa. • Don't find any significant results for trade with the Sub Saharan Africa on the growth of CIS countries, they obtain positive impacts for the CIS and East Asia and significant negative results for Latin America and the OECD.
Jenish (2013)	South->South	2000-2010	• Estimates the impact of different trade flows on the growth of the CIS countries (intra regional trade (excluded Russia), the extra regional trade and the trade with the Russia) • Estimates significant positive coefficients only for the impact of trade with the Russia.
Tochitskaya, Aksen (2004)	South->South	1995-2000	• Analyze the effects of the participation of Belarus in Customs Union of the CIS countries. • The medium and high-tech product groups of Belarus are affected by the trade diversion effects of this participation.
Tavadyan *et. al*. (2013)	South -> South	2000-2012	• Evaluate a multiple regression equation in the historical period for the years between 2000 and 2012 for performing an alternative scenario calculation for the economic integration variable for the years after 2014. • Investigate the growth effects of participation to the Customs Union of Russia, Belarus and Kazakhstan and find that after the participation Armenian growth rates would be higher at least by 2 percentage points. • The growth effects of participation to Customs Union and Single Economic Space, increase in growth rates would be approximately 3.2 percent.