Turkey-African Trade Relationship; New Insights From Panel Causality Analysis

Türkiye-Afrika Ticari İlişkileri; Panel Nedensellik Analizi Bağlamında Yeni Bir Değerlendirme

Alper YILMAZ, Adnan Menderes University, Turkey, alper.yilmaz@adu.edu.tr

Orcid No: 0000-0002-1253-7097

Abstract: This research aims to investigate Turkey African relationship on the basis of international trade between Turkey and selected African countries. Most of African economies have experienced rapid economic growth as an outward oriented nation recently and foreign trade between Africa-Turkey has been grown continuously. In this frame we want to find out contribution of Turkish-African trade relationship on their economic growth on the basis of selected variables. For this purpose we used real gross domestic product (Rgdp) of 20 African countries as a proxy for 'economic growth'' and foreign trade volume (FTV) and balance of trade (BoT) with Turkey as a proxy for ''foreign trade''. In this frame we employed bootstrap panel causality test developed by Kónya (2006) with countryspecific bootstrap critical values for the panel of twenty selected African countries for the period 1990–2016. Empirical results point out a unidirectional causality relationship between variables which runs from foreign trade to real GDP.

Keywords: International Trade, Economic Growth, Panel Data Models

JEL Classification: C23, F10, F43

Özet: Bu çalışma Türkiye-Afrika arasındaki ticari ilişkileri seçilmiş Afrika ülkeleri bağlamında incelemeyi hedeflemektedir. Geçtiğimiz dönemlerde pek çok Afrika ülkesi dışa dönük ekonomi anlayışı çerçevesinde hızlı bir büyüme sürecine girmiş ve bu süreçte Türkiye-Afrika ticari ilişkileri sürekli gelişmiştir. Bu çalışmada Türkiye'nin söz konusu ticaretinin seçilmiş Afrika ülkeleri bağlamında ekonomik büyüme sürecinde ne kadar etkili olduğunu ortaya koymaya çalıştık. Bu doğrultuda ekonomik büyümeyi temsilen, 20 Afrika ülkesine ait reel GSYİH (Rgdp) rakamlarını ve dış ticaret değikenini temsilen de dış ticaret hacmi (FTV) ve ödemeler dengesi (BoT) verilerini kullandık. Bu çerçevede 2006 yılında Konya tarafından geliştirilen ve SUR (Görünürde İlişkisiz Regresyon) yöntemine dayanan panel nedensellik testi, seçilmiş 20 Afrika ülkesinin 1990-2016 dönemine ait verilerine uygulanmıştır. Ampirik sonuçlara göre dış ticaret değişkenlerinden ekonomik büyüme doğru nedensellik ilişkisinin olduğu tespit edilmiştir.

Anahtar Kelimeler: Uluslararası Ticaret, Ekonomik Büyüme, Panel Veri Modelleri

JEL Sınıflandırması: C23, F10, F43

1. Introduction

International trade and economic growth interaction has been more hotly contested argument of whether it actually boots economic growth and development. This debates have their origin from the accelerator role of international trade activities in economic growth and development. Therefore various economists and economic institutions have opted for outward-oriented development (Moon 1997).

According to classical international trade theory all country has to import their consumption or intermediate goods to some extent. There is no country in an autarchy position. There is two way relationship that realized in a trade flows. Countries export goods and services to import another goods and services which cannot be produced domestically (Adeleye et al. 2015). Secondly export orientation enable countries to access larger outside markets which acts as a stimulus to domestic output, exploiting economies of scale, knowledge and technological spillovers from exporting experience, improvement in efficiency in resource allocation, increase in employment, (Grossman and Helpman 1991, Agosin 1999; Giles and Williams 2000), enhancing specialization in production of export commodities, directing economic resources toward highly productive exports sector and lastly relaxing the foreign exchange constraints by earning nationally. Benefits of International Trade are more explicit for least developed and developing countries. When in the case of Africa, foreign trade volume has grown remarkably in the last couple of centuries and these activities have supported economic growth rates of them. Foreign trade volume and average GDP growth rate for selected African countries are shown in table 1 (Balassa 1977, Buffie 1992, Riezman et al. 1996).

Table 1. Trade Volume and GDP Growth in Selected 20 African Countries

Country	Foreign Trade Volume (Million U.S.$)			Average GDP Growth Rate (%)		
	1980	2000	2017	1980-1989	1990-1999	2000-2017
Algeria	27.387	34.440	81.244	2.8	1.5	3.6
Benin	747	1438	3799	3.1	4.9	4.2
Cameroon	3708	5123	16.896	4	0.3	4.3
Congo, Dem.	4725	5156	13.286	1.8	-5.4	5.3
Congo, Rep.	2049	3989	12.701	6.8	0.8	3.8
Cote d'Ivoire	7751	7998	22.167	0.2	2.4	3.4
Egypt, Arab	16.813	38.955	92.282	5.9	4.3	4.1
Ethiopia	2068*	2086	4332	2.4	2.6	9
Ghana	783	5783	27.077	1.9	4.2	6.2
Gabon	4123	5154	7700	1.8	2.4	2.6
Kenya	4752	6773	22.437	4.2	2.2	4.8
Morocco	10.286	22.988	70.690	4.8	3.2	4.4
Nigeria	31.183	33.110	69.637	-1.4	2.6	6.7
Niger	1573	782	3753	0.4	1.8	5.1
South Africa	50.526	70.141	171.299	2.2	1.3	2.7
Sudan	2516	3604	14.517	3.4	4.4	5
Senegal	2180	3048	9718	2.3	2.7	4.3
Tanzania	2132*	3411	12.483	3.7	3.2	6.7
Tunisia	7505	17.706	34.818	3.5	5	3.2
Zambia	2437*	2174	16.835	1.4	1.3	6.2

Sources: World Bank Data, Trading Economics, ITC Trade Map.

*Year of data are 1994 for Zambia, 1991 for Tanzania and 1995 for Ethiopia.

As can be seen foreign trade volume registered an impressive growth for both countries due to positive effect of international trade particularly after 2000. Secondly majority of the countries maintained a higher average growth rate of GDP during 2000-2017 than in the 1980s and 1990s. Because of some social and economic problems, African economies couldn't accelerate enough their economic growth for these years. The most outstanding social problems were political fragility, racism, ethnic divide-and-rule strategies, widening differences between social strata, landlessness, accelerating urbanisation, ill-situated institutions. Secondly there were also severe economic problems that is high unemployment, low productivity, over extended public sector, neglect of export-oriented industries, emphasise on primary product in export orientation, poor infrastructure, unsatisfied performance of private sector. In addition social and economic problems, there were also some institutional problems has remained unsolved for many years which were lack of restructuring and reorganisation of institutions after post-colonial period such as legal system, transport system, health system, education and public administration. These unpleasant combinations hampered economic growth and African countries had gained little in favour of trade expansion before 2000 period (Ezenwe 1982, Bbaale and Mutenyo, 2011).
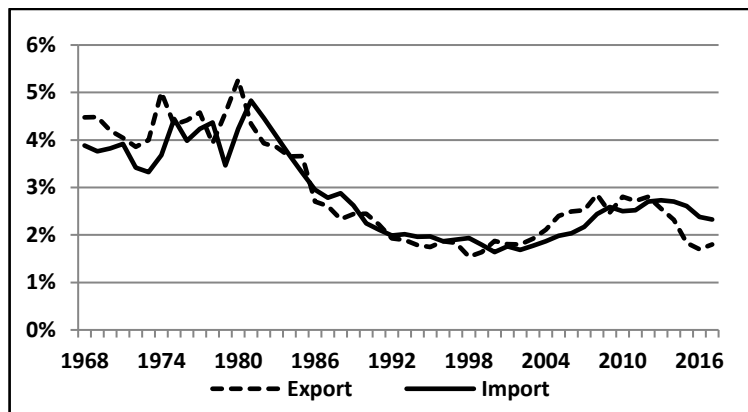

Figure 1. Share of Africa in World Trade (%), *Source:* World Bank Data 2016

According to Figure 1, Africa's share of world trade visually suggests that she is progressively marginalized from world trade between1980-2000. Her share was changing up and down around %4 during 1970s but after neo-liberal policies in global economies, its share declined from %4 percent in 1980 to about %1.6 in 2000, while her share of world imports declined from over %3.2 to %1.5 over the same period and so, for these decades benefits of globalisation were elusive for Africa (Subramanian and Tamirisa 2003).

In the late 1980s, African economies had entered a recession period. Most of them had been increasingly gaining comparative advantage in labour-intensive instead of capital intensive manufacturing. Trade liberalization, had begun early 1980s, and prematurely infant

industries exposed to global strong competition of western world. Within this narrow range of production, Africa's market share has been shrinking during 1980s and 1990s (Sundaram et al. 2011).

However after 2000's, African economies gained momentum in expansionary period of global economy. They have been increasing global integration of economic and political process. Opening up domestic economies by accelerating of cross border relations, liberalization in international trade and rapid progress of information technology has changed the picture for them. In the period of economic recovery and renewal development, there were taken some series of political measures and policy implications. Firstly agriculture sector designed to improve market efficiency, reduced budget deficits and stimulated export production (Kherallah et al. 2002). Secondly opening up to international trade and improvement of the current account balance helped African countries more stable international trade environment. Third step was labour market. Structural transformation has conducted that involves the reallocation of labour from low to high productivity sectors, specialization on manufacturing rather than mining, increase in human capital that provide them productive knowledge and capabilities. Besides transforming business environment into cost effective way and removing bureaucratic barriers helped private sector become more dynamic. Also Improvements in infrastructure (e.g. electricity generation and transmission line, telecommunication) have also been very supportive for private sector. (Leke et al. 2010, Kaberuka 2013, Bhorat et al. 2015). Complementary to this reform, a quantitative change has occurred in the management of economies such as, giving central banks more independence from government sand strengthening of democratic institutions and accountability. Lastly reduction of external debt as a result of debt relief and financing investment through domestic credit markets rather than through external debt, debt to Gross National Income (GNI) levels has fallen steadily since 2000 for the continent. This is in turn means lower risk perceived by foreign investors (Elumelu 2009).

Africa is well endowed with natural resources with improvement in human resources, dynamic and young population and growing market potential. But it lacks the know-how and technological capabilities and also there is insufficient capital stock and financial depth. There is need for bring to Africa effective practices, capital, upgrade traditional industries, know-how, knowledge based cooperation to promote value-added processing of primary products (Karumbidza 2007, Edoho 2011). Africa's agro-ecological potential (Thurow 2010), young population with a growing labour force (Leke and Barton 2016), high urbanization rate and higher growth rates of cities than other regions of the world (Bafana 2016, Clos 2016, Gadzala 2018), flourishing middle class with disposable income and a willingness to spend

(Obonyo 2016, Kuwonu 2016) and lastly enormous energy resources and rare minerals (BP 2016, Singh et al. 2017, Gadzala 2018) offers a wide variety of opportunuties for investors and new investment climate has taking place in Africa. They have attracted billions of capital from international financial institutions and private investors (Fioramonti 2014). Emerging powers such as China or global powers such as USA have been developing multi-billion dollar projects. As a regional actor, Turkey is also interested in Africa too. Opening to Africa policy has conducted in the frame of multidimensional foreign policy and access to new export markets. This policy is mostly driven by new perception of Turkish economic relations in a new global political economy and its re-orientation.

Turkish African relationship has been grown on mutually beneficial basis, equality of partnerships, mutuality of interest and reciprocal respect. For this purpose Turkey has been sharing their technical expertise, managerial capabilities, production techniques, and modernization experiences with Africa (Özkan and Akgün, 2010; Korkut and Civelekoğlu, 2013). Firstly *"Africa Action Plan"* was started in 1998. According to this plan, number of Embassies in Africa would be increased, official representing cadres of sub-Saharan African Embassies would be improved. Action plan was also aimed to organize high level (e.g. President, Prime Minister) invitations from both sides, increase political consultations and communications in International organizations, and promote humanitarian aid to Africa and lastly signing official agreements to facilitate trade and economic relations (Bacchi, 2015). At the second step in 2003, the Turkey designed a new strategy on the development of the economic and social relations. Subsequently, in 2005, the declaration of *"Year of Africa"* is to be considered as the beginning of Turkey´s new policy. This initiatives states to reawaken economic matters and relationship of common concern on the basis of mutual gains by convincing and participating counter trade partner with Turkey, not seeks a form of hegemony or resources exploitation. In this context, Turkey has pursued a multilayered policy.

In the new era of Turkey-African relationship, the African Union (AU) accorded Turkey an observer status, in January 2008, Turkey was declared as one of the strategic allies of the African continent. As a result of new diplomatic drive by Turkey, 20 new embassies were opened in 2009 and this number increased to 41 as of 2018 (Dodo 2016, MFA 2016). Besides Turkey signed trade agreements with 38 African countries. Also Turkish Foreign Economic Relations Council (TFERC) established business councils with 19 Sub-Saharan African countries and has opened up 26 *''Commercial Consulates''* in various African capitals. Turkey's political engagements with Africa not only have been conducted on political basis, they have also been matched by an intensification of economic and commercial relations.

Table 2. Turkey's Trade with Africa (Millions US$)

Year	Export			Import		
	Total Turkey	North Africa	Sub-Sharan Africa	Total Turkey	North Africa	Sub-Sharan Africa
1997	26 261	980	253	48 559	1 813	385
1998	26 974	1 502	316	45 921	1 493	265
1999	26 587	1 344	311	40 671	1 404	283
2000	27 775	1 087	285	54 503	2 257	457
2001	31 334	1 150	371	41 399	2 115	704
2002	36 059	1 267	430	51 554	2 138	558
2003	47 253	1 577	554	6 934	2 519	820
2004	63 167	2 203	765	97 540	3 231	1 589
2005	73 476	2 544	1 087	116 774	4 212	1 835
2006	85 535	3 097	1 469	139 576	4 878	2 526
2007	107 272	1 030	1 947	170 063	3 616	3 168
2008	132 027	5 850	3 212	201 963	3 535	2 060
2009	102 142	7 416	3 738	140 928	2 237	1 700
2010	113 883	7 025	2 257	185 544	3 098	1 725
2011	134 906	6 700	3 633	240 841	3 342	3 424
2012	152 461	9 444	3 913	236 545	3 308	2 613
2013	151 802	10 047	4 103	251 661	3 508	2 522
2014	157 610	9 757	3 966	242 177	3 435	2 502
2015	143 838	8 527	3 921	207 234	3 006	2 092
2016	142 529	7 755	3 650	198 618	3 200	2 154
2017	156 992	7 524	4 148	233 799	4 142	3 033

Source: Turkish Statistical Institute, 2018 Data

Accordingly Turkey-Africa trade volume was $3.4 billion in 1997 and increased to $18.8 billion in 2017 and total amount of Turkish investments in Africa has reached $6 billion level in 2017. Economically, both sides benefit from increase in trade and development cooperation. Economic involvement can be divided into the categories; trade relations and humanitarian/development aid. Within this scope firstly Turkey has granted $1 million to the African Union since 2009. In 2012, Africa was still the leading regional recipient of Turkish Non-Governmental Organization assistance with $69 million. Secondly Turkey has provided scholarship more than 8000 African students since 1992. Lastly in 2016, Turkey's official development assistance to Africa was $383 million in which $153 million was share of Sub-Saharan Africa. In terms of trade, it is possible to observe progress. Turkey sees Africa as a continent in the middle of modernisation and wants to play a significant part in this development period by expanding and accelerating both humanitarian and commercial efforts. Rising bilateral commercial activities will be both positive for two sides (Bilgiç and Nascimento 2014, Özkan 2016, Tepeciklioğlu et al. 2017).

2. Related Literature

In this paper we analysed trade relationship between selected African countries and Turkey whether expansionary or not on GDP. The paper's contribution is handling the subject (foreign trade and economic growth) on African countries from the aspect of Turkish trade

relationship. Explicitly looking at the growth effect of trade in goods and services with Turkey. Our study focused on beyond previous studies by not only using more recent data, but more importantly, by adopting new causality model in which using a bootstrap panel granger causality analysis latently developed by Kónya (2006). The main aim of this study is to investigate foreign trade with Turkey and its influence on economic growth of selected African economies. Our objectives are to identify relevant variables (balance of trade and trade volume) which play a role on foreign trade with Turkey and economic growth in selected African countries and to determine whether variables are in *causality* relationships.

Empirical studies in the literature mostly emphasized on the positive effects of international trade. Early studies employed cross-sectional methods from 1970s to the first half of the 1980s and most of them found positive correlation. After 2000's researchers have been employing advanced econometric methods like panel causality or nonlinear causality analysis. When we evaluate countries in terms of the export-based growth model, there are a number of studies that reveal a positive relationship. In generally foreign trade shift resources between low and high-productivity sectors and correspondingly stimulate output, give rise to increase in capacity use, allows home country to specialise on investment in sectors where it gets comparative advantage, bring fierce competition, exploiting from economies of scale, allowed to import raw materials or inputs to produce export products, poor countries with limited home markets have the chance to penetrate across the scale economies and lastly foreign exchange constraints would be eased. Since exports is a component of GDP, rapid export growth leads to even faster GDP growth (Michaely 1977, Balassa 1978, Ram 1985, Moschos 1989, Dodaro 1993; Ukpolo 1994, Bahmani and Alse 1993, Onafowora et al. 1996, Giles and Williams 2000, Lee and Huang 2002, Narayan et al. 2007, Oskooee and Economidou 2009, Bbaale and Mutenyo 2011, Guena and Christian 2012, Arodoye and Iyoha 2014). Secondly trade openness and liberalised trade (e.g. low tariff) structure allows for the purchase of more capital goods from foreign countries, access of advanced technological knowledge from trade partners, allowed to access huge consumer markets, encouraging R&D and also provide domestic country intermediate goods or raw materials that are vital to their industrial processes (Kim et al., 2012; Menyah et al., 2014; Brueckner and Lederman; 2015; Bourdon et al., 2017; Sakyi, et al., 2017).

There is two main hypothesis about trade and growth relationship and there is no consensus between them. First one is Export Led Growth (ELG) hypothesis argue that export growth has a positive impact on output. The ELG hypothesis consider positive correlation. It means there is positive causal link that running from exports to output growth (Balassa 1978, Singer and Gray 1988, Greenaway and Sapsford 1994, Moreno 1999, Lopez and Cruz 2000).

On the other hand, Growth Led Export (GLE) hypothesis argue the opposite direction about causality link between them in which economic growth bring about better exports. Economic growth boosts the improvement and diversification of skills through the division of labour and the implementation of new technologies which in turn support exports performance. So the direction of causality run from economic growth to export (Kunst and Marin 1989, Ahmad and Harnhirun 1996, Awokuse 2007). Besides there is possibility that feedback causality (two way) exists between trade and economic growth due to mutual dependence. Economies of scale lead to cost reduction and comparative advantage due to larger market size and higher level of foreign demand leads to economic growth which in turn increases the exports volume. The last approach is the neutrality hypothesis. This view handles the subject on the basis of ineffectiveness means that there is no any causal relationship between these variables. We sum up these approaches in table 3;

Table 3. A Summary of Some of the Empirical Studies Investigating the Relationship Between Export and Growth for SSA Countries

Author	Period	Countries	Methodology	Results
ELG Hypothesis;				
Edo et al. (2019)	*2005-2017*	*8 SSA Countries*	*Panel ARDL Model*	*Empirical results revealed that there is positive impact of export on economic growth in the short run but it is statistically insignificant.*
Mosikari et al.	*1980-2012*	*14 SSA Countries*	*Panel Causality Model*	*Empirical results show that there is long run causality running from manufactured export to economic growth, and there is significant positive impact of total export on economic growth.*
Fosu (1990)	*1960-1980*	*28 African LDC's*	*Pooled Regression and Ordinary Least*	*Study is concluded with exports exert a positive and significant impact on economic growth.*

			Square	
Brempong (1991)	*1960-1986*	*34 SSA Countries*	*Cross Sectional Analysis and Ordinary Least Square (OLS)*	*According to empirical results, authors argue that export instability has a negative and significant effect on the economic growth.*
Olayungbo (2019)	*1970-2015*	*Nigeria*	*Bayesian Time-Varying Parameter (TVP) model*	*Author points out revenue from oil export is found to be positively and significantly contribute to economic growth*
Ee (2015)	*1985-2014*	*3 SSA Countries*	*Panel Cointegration, FMOLS and DOLS Technique*	*After confirmation of cointegration relationship, author stated that there exists a long run relationship between exports and growth according to FMOLS and DOLS methods.*
Oskooee and Economidou (2009)	*1960-1999*	*62 LDC's Including Africa*	*Granger and Sims Causality Detection Approach*	*According to Johansen's cointegration technique, results are country specific means that there are some countries provide evidence for ELG hypothesis*

GLE Hypothesis;

Reppas and Christopoulos (2005)	*1969-1999*	*22 Asian and African LDC's*	*Panel Cointegration Tests and FMOLS*	*The empirical findings proved one direction relationship that output growth causes exports.*
Amirkhalkhali and Dar (1995)	*1961-1990*	*23 Developing*	*Swamy-Mehta*	*They found that economic growth is in statistically*

		Countries	methods and OLS	significant relationship with exports growth for all except inward oriented economies.
Tekin (2012)	1970-2009	18 LDC's	Panel Causality Analysis Developed by Konya (2006)	According to the results indicate direct causality run from economic growth to export for Angola, Chad and Zambia.

Neutrality Hypothesis;

Ulaşan (2015)	1960-2000	130 countries including SSA	Panel OLS	Trade openness by itself does not boost economic growth.
Ahmed and Kwan (1991)	1981-1987	47 African Countries	Panel Granger Causality	Writers found no causal link from exports to growth.
Furuoka (2018)	1980-2013	24 SSA Countries	Fourier ADF with structural break test and Rolling causality test	According to the results, exports and economic growth causality linkages were found to be weak and unstable for 24 SSA countries.

Feedback Hypothesis;

Sunde (2017)	1970-2013	South Africa	Time Series ARDL Model and VECM Granger Causality	The article confirmed cointegration between economic growth and exports. The VECM Granger causality analysis found bidirectional causality between

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				economic growth and export
Ndoricimpa (2014)	*1980-2011*	*17 SSA Countries*	*Dimitrescu and Hurlin Granger Causality Test*	*ELG and GLE hypothesis is only evident in 2 out of 17 COMESA countries, rest of them are not support both hypothesis.*
Ukpolo (1994)	*1969-1988*	*8 Low Income African Countries*	*OLS*	*The Results did not prove enough evidence about positive contribution of the manufactured exports sector to economic growth.*
Amoateng and Amoako (1996)	*1971-1990*	*35 African Countries*	*Granger Causality*	*Findings support bilateral relationship for all countries.*

Within this frame some paper deals with interaction between trade balance and economic growth through various channels. Some of these papers argue that causality runs from economic growth to balance of trade (Ujiie and Yeung 1972, Sedjo 1971, Kim 1996). There has been given little attention to the trade strategies followed and the types of trade relations established. Most empirical studies focused on trade volumes and measures of openness. However with this study, we gave attention to bilateral relationship with individiual country. This research starts with theoretical background in part 1. In part 2, literature review from the perspective of foreign trade effect on economic growth. In part 3, we specified main model, the data and variables used in this research are explained. Estimation procedures are discussed and econometric approaches are applied respectively in part 4. Also we present empirical results according to the model constructed by offering an explanation of each coefficient. In part 5, policy implications and the main conclusion are drawn respectively.

3. The Model Specification and Data

After presentation of the existing empirical literature we set our panel model. In our model, relationships between variables are on the condition that real GDP (Rgdp) is dependent variable and foreign trade volume with Turkey (Ftv) and balance of trade with Turkey (BoT) is independent variable as follows;

$$rgdp_{it} = \beta_{0i} + \beta_{1i}ftv_{it} + \beta_{2i}bot_{it} + \varepsilon_{it}$$

(1)

For this purpose we collected data (1990-2016) from the Turkish Statistical Institute and World Bank online database. Our objective is to assess whether Granger causality relationship between these variables. The panel consists of twenty African countries namely; Morocco, Algeria, Tunisia, Benin, Democratic Republic of Congo, Ethiopia, Côte d'Ivoire, Gabon, Ghana, South Africa, Cameroon, Kenya, Egypt, Tanzania, Zambia, Congo, Sudan, Senegal, Nigeria and Niger. Real GDP is in constant price of 2010 US dollars was chosen as a proxy for the economic growth and independent variables are foreign trade volume with Turkey (Ftv) and balance of trade (BoT) with Turkey in again US dollars.

4. Methodology

In this study, we utilized Granger causality analysis. It is common to use to investigate causal interactions among variables. In the standard test, it is investigated that whether variable X is causing variable Y. (Gujarati 2004). This test can be applied under different kind of relationship and some of them have been developed to examine causality relationships for panel models.

First approach of Holtz-Eakin et al. (1988), they developed a method of estimating and testing Panel Vector Auto Regression (PVAR) equations for homogeneous panels. Second approach of no cointegration, Dimitrescu - Hurlin (2012) proposed a simple Granger (1969) non causality test in heterogeneous panel data models with fixed coefficients. It's the natural extension of the standard time series tests in the cross-sectional dimension. Thirdly in the case of cointegration, researcher specified a model based on panel vector error correction model (Panel VECM) by means of a generalized method of moments (GMM) estimator. i.e. Canning and Pedroni (2008), Narayan and Smyth (2009). Fourthly, Emirmahmutoğlu and Köse (2011) proposed a panel causality test based on meta-analysis in heterogeneous mixed panels and alternative approach for testing coefficient restrictions of a level VAR model for integrated or cointegrated process.

However, all of these approaches do not consider *cross-sectional dependence* and *heterogeneity*. Furthermore, the GMM estimators can produce inconsistent and misleading parameters unless the slope coefficients are really homogeneous (Pesaran et al. 1999). So in granger causality analysis, researcher should be careful to cross sectional dependence and homogeneity. Otherwise estimating sets of equations with Seemingly Unrelated Regression (SUR) is more efficient than that of equation-by-equation with least-squares (OLS) (Zellner 1962).

4.1. Panel Granger Causality

In this context, Konya (2006) proposed panel causality test based on Seemingly Unrelated Regressions (SUR) and Wald test with bootstrap critical values. This test does not require pretesting for unit roots and cointegration and is able to performed under both cross-sectional dependency and country-specific heterogeneity. In this frame, the bootstrap panel causality approach formulates a system of two sets of SUR equation according to our model as follows between Rgdp and Ftv;

$$rgdp_{1,t} = \alpha_{1,1} + \sum_{i=1}^{ly_1} \beta_{1,1,i} rgdp_{1,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,1,i} ftv_{k,1,t-i} + \varepsilon_{1,1,t}$$

$$rgdp_{2,t} = \alpha_{1,2} + \sum_{i=1}^{ly_1} \beta_{1,2,i} rgdp_{2,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,2,i} ftv_{k,2,t-i} + \varepsilon_{1,2,t}$$

$$\vdots$$

$$rgdp_{N,t} = \alpha_{1,N} + \sum_{i=1}^{ly_1} \beta_{1,N,i} rgdp_{N,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,N,i} ftv_{k,N,t-i} + \varepsilon_{1,N,t}$$

(2)

$$ftv_{k,1,t} = \alpha_{2,1} + \sum_{i=1}^{ly_2} \beta_{2,1,i} rgdp_{1,t-i} + \sum_{i=1}^{lx_2} \gamma_{2,1,i} ftv_{k,1,t-i} + \varepsilon_{2,1,t}$$

$$ftv_{k,2,t} = \alpha_{2,2} + \sum_{i=1}^{ly_2} \beta_{2,2,i} rgdp_{2,t-i} + \sum_{i=1}^{lx_2} \gamma_{2,2,i} ftv_{k,2,t-i} + \varepsilon_{2,2,t}$$

$$\vdots$$

$$ftv_{k,N,t} = \alpha_{2,N} + \sum_{i=1}^{ly_2} \beta_{2,N,i} rgdp_{N,t-i} + \sum_{i=1}^{lx_2} \gamma_{2,N,i} ftv_{k,N,t-i} + \varepsilon_{2,N,t}$$

(3)

We can also identify panel granger causality between Rgdp and BoT;

$$rgdp_{1,t} = \alpha_{1,1} + \sum_{i=1}^{ly_1} \beta_{1,1,i} rgdp_{1,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,1,i} bot_{k,1,t-i} + \varepsilon_{1,1,t}$$

$$rgdp_{2,t} = \alpha_{1,2} + \sum_{i=1}^{ly_1} \beta_{1,2,i} rgdp_{2,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,2,i} bot_{k,2,t-i} + \varepsilon_{1,2,t}$$

$$\vdots$$

$$rgdp_{N,t} = \alpha_{1,N} + \sum_{i=1}^{ly_1} \beta_{1,N,i} rgdp_{N,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,N,i} bot_{k,N,t-i} + \varepsilon_{1,N,t}$$

(4)

$$bot_{1,t} = \alpha_{1,1} + \sum_{i=1}^{ly_1} \beta_{1,1,i} rgdp_{1,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,1,i} bot_{k,1,t-i} + \varepsilon_{1,1,t}$$

$$bot_{2,t} = \alpha_{1,2} + \sum_{i=1}^{ly_1} \beta_{1,2,i} rgdp_{2,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,2,i} bot_{k,2,t-i} + \varepsilon_{1,2,t}$$

$$\vdots$$

$$bot_{N,t} = \alpha_{1,N} + \sum_{i=1}^{ly_1} \beta_{1,N,i} rgdp_{N,t-i} + \sum_{i=1}^{lx_1} \gamma_{1,N,i} bot_{k,N,t-i} + \varepsilon_{1,N,t}$$

(5)

In our study equation 2 indicates Granger causality that runs from *Ftv* to *Rgdp* and equation 3 indicates causality *Rgdp* to *Ftv* variables respectively. In the second set of equation it means equation 4 and 5, we describe a system which includes balance of trade with Turkey (*BoT*) and again real GDP (*Rgdp*). Equation 4 describes causality from *BoT* to *Rgdp* and equation 5 describes *Rgdp* to *BoT*. N is the number of cross section (20 African countries in our study), t denotes the time period (21 years) and l represent lag length. The common coefficient is α, the slopes are β and γ, and ε is the error term. For each system there are maximal lags for Real GDP and trade indicators, which are the same across equations. Apart from other methods this system has two original aspects. First one is the error terms might be contemporaneously correlated due to different predetermined variables in the system of equation (i.e., cross-sectional dependency), these sets of equations represent in the SUR system. Secondly, the variables in the system do not need to be stationary because country specific bootstrap critical values are used in the causality equations (Kónya 2006, Kar et al. 2011).

We can draw four possible combinations in panel causality model; (i) one way causality from X (independent variable) to Y (dependent variable) in the case of all $\gamma_{1,i}$ are zero but all $\beta_{2,i}$ are not zero, (ii) one way Granger causality running from Y to X in the case of all $\gamma_{1,i}$ are zero, but not all $\beta_{2,i}$ are zero, (iii) two-way Granger causality between X and Y if neither $\gamma_{1,i}$ nor $\beta_{2,i}$ are zero and finally (iv) there is no causality if all $\gamma_{1,i}$ and $\beta_{2,i}$ are zero. In the test, country specific bootstrap critical values must be calculated to make a decision. For this purpose, equation (2) is estimated under the null hypothesis that there is no causality from X to Y (i.e. all $\gamma_{1,i,l} = 0$ for all i and l) and the residuals are obtained from;

$$e_{H_0,i,t} = y_{i,t} - \hat{\alpha}_{1,i} - \sum_{l=1}^{ly_1} \beta_{1,i,l} y_{i,t-1}$$

(6)

For I = 1,2,…..N and t = 1,2,…T. From these residuals, NxT [$e_{H_0,i,t}$] dimension matrix is calculated. Secondly residuals are resampled by this matrix and selected bootstrap residuals

are denoted as $e^{*}_{H_0,i,t}$ where t = 1, 2,...T*. Thirdly the bootstrap sample of Y is generated under the assumption of no causality running from X to Y by using following equation;

$$y^{*}_{i,t} = \hat{\alpha}_{1,i} + \sum_{l=1}^{ly_1} \hat{\beta}_{1,i,l} y^{*}_{i,t-1} + e^{*}_{H_0,i,t}, \quad t = 1,....T^{*}.$$

(7)

Than $y^{*}_{i,t}$ substitutes for $y_{i,t}$ in equation (6) and a system of equations is re-estimated. Null hypothesis of no causality is indicated by the Wald test. The empirical distributions of the test statistics are developed by repeating these steps again. The bootstrap critical values are specified by selecting appropriate percentiles (90 for %10, 95 for %5 and 99 for %1 significance level) of sampling distributions. To conclude causality, Wald test statistics are compared with the bootstrap critical values. But keep in mind that determining the optimal lag length(s) is important for robustness of outcomes, because results from the causality test may be sensitive to the lag structure. So following Kónya (2006), it can be possible for different lags in each system but did not allow for different lags across countries. Assuming that the number of lags ranges from 1 to 4, we estimated all equations and optimal lag length represent the lag for which Schwarz Bayesian Criterion has minimal levels.

4.2. Preliminary Analysis: Cross-Section Dependency and Homogeneity

Panel data models generally contain cross-sectional dependence in errors which may arise from common shocks, unobserved components, spatial dependence and idiosyncratic pair wise dependence. Especially financial integration of countries and financial entities of global economic structure has resulted in mutual dependence between countries (cross-sectional units) (Hoyos and Sarafidis 2006). So we should check possible dependence between countries. In our model, variables can interact with each other in ways that any exogenous shock affects cross country variables and in turn may affect causal links between foreign trade volume, balance of trade and real GDP. Otherwise if we do not consider, we probably engage in biased estimates and spurious inference in our panel model. So we need to determine whether or not presence of cross section dependence between variables. For this purpose we used CDLM$_1$ (Breusch-Pagan 1980), CDLM$_2$ (Pesaran 2004 CDLM), CDLM (Pesaran 2004 CD) and Bias adjusted CD tests (Pesaran et all., 2008). For this purpose, we estimate the following panel data regression model;

$$\Delta y_{i,t} = d_i + \delta_i y_{i,t} + \sum_{j=1}^{p_i} \lambda_{i,j} \Delta y_{i,t} + u_{i,t}$$

(8)

where d_i is deterministic (constant or trend) component and p is the lag length (s). To test for the null hypothesis of no cross-sectional dependency H_0: Cov $(u_{it}; u_{it})$ = zero for all t and i $\neq$ j, against the alternative hypothesis of cross-sectional dependence H_1: Cov $(u_{it}; u_{jt}) \neq 0$ for at least one pair of i $\neq$ j. To test cross-section Breusch and Pagan (1980) developed the following Lagrange multiplier statistic;

$$CD_{LM_1} = T\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}^2$$

(9)

where, N is the number of countries (cross section), T is time period, $\hat{\rho}_{ij}$ is the residuals from the ordinary least squares (OLS) estimation of equation (3) for each i. However, the CDLM$_1$ test is valid only for N relatively small and T sufficiently large. To solve this drawback, Pesaran (2004) proposed following scaled version of the LM test;

$$CD_{LM_2} = \left[\frac{1}{N(N-1)}\right]^{1/2}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}(T\hat{\rho}_{ij}^2 - 1)$$

(10)

CDLM$_2$ test has a standard normal distribution under null hypothesis but it is probably to encounter substantial size distortions if N is large and T is small. For this purpose we need for a cross-sectional dependence test applicable to a large N and a small T to overcome shortcomings of the CDLM$_1$ and CDLM$_2$ tests. Herein Pesaran (2007) proposed the following test statistic;

$$CD_{LM_3} = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\rho_{ij}\right)$$

(11)

Under the null hypothesis of no cross-sectional dependency when T→∞ and N→∞, CDLM$_3$ test is asymptotically normal distributed. After specifying cross sectional dependency, we need to determine homogeneity of the slope. For this purpose we utilized from delta test. The $\tilde{\Delta}$ (delta) and $\tilde{\Delta}_{adj}$ (Adjusted Delta) tests of Pesaran and Yamagata (2008) in order to examine slope homogeneity. Delta test in Pesaran and Yamagata (2008) for $\tilde{\Delta}$ and $\tilde{\Delta}_{adj}$ test equations are respectively as;

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{\sqrt{2k}}\right) \quad \tilde{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - E(\tilde{z}_{iT})}{\sqrt{\text{var}(\tilde{z}_{iT})}}\right)$$

(12)

where $E(\tilde{z}_{iT}) = k$ and $Var(\tilde{z}_{iT}) = 2k(T-k-1)/T+1$. N is number of cross section, $\tilde{S}$ is Swamy test statistic, k is explanatory variables.

4.3. Empirical Results

The results from the cross-sectional dependency are reported in Table 4. Secondly we test homogeneity of variables by using Δ and Δ_{adj} test. In our model, African economies are not same as in their stages of development, so it's unlikely to assume slope coefficients are homogeneous (Luintel and Khan, 2009). Also imposing the joint restriction for the whole panel (assuming homogeneity) may miss out the country specific characteristics (Breitung, 2005).

Table 4. Results for Cross Sectional Dependence and Slope Homogeneity Test

Cross-Sectional Dependence	Rgdp		BoT		Ftv	
	Test Stat.	P. Value	Test Stat.	P. Value	Test Stat.	P. Value
CDLM$_1$	312.97***	0.00	417.58***	0.00	503.49***	0.00
CDLM$_2$	6.30***	0.00	11.67***	0.00	16.08***	0.00
CDLM	2.01***	0.00	2.62***	0.00	2.35***	0.00
BiasAdj. CD	38.32***	0.00	7.05***	0.00	25.56***	0.00
Slope Homogeneity						
Δ Test	28.72***	0.00	30.69***	0.00	24.91***	0.00
$\Delta_{adj.}$ Test	31.02***	0.00	33.15***	0.00	26.94***	0.00

***indicates the rejection of null hypothesis at the 1% significance level.

From table 4, it is clear that there is cross sectional dependence between panel members meaning that the SUR method is more appropriate rather than OLS estimation. Also it means that any shock occurred in one countries seems to be transmitted to the other countries. Furthermore, table 4 also illustrates slope homogeneity. This result indicates us imposing homogeneity restriction on the variable may leads to misleading inferences in the panel causality analysis

The results from the bootstrap panel Granger causality analysis for the null hypothesis of real gdp does not cause foreign trade volume and vice versa is reported in Table 5 (a). In the first part of table we deal with Granger causality relationship between Rgdp and Ftv on selected African countries. Firstly we showed the test results for the null hypothesis Rgdp does not cause Ftv and secondly Ftv does not cause Rgdp. In the continued table we did same

analysis with Rgdp and Bot variables. To conclude any comment we compared Wald statistics with Bootstrap critical values. %1, %5 and %10 significance levels are set for according to their position in the list of critical values. For example *99 th. observation* in the list of critical values represent *%1 significant level*, 95 th observation is for %5 level and 90th.for %10 level for the appropriate country. If Wald test statistics are greater than bootstrap critical values null hypothesis would be rejected.

Table 5 (a). Results For Bootstrap Panel Granger Causality Test

Countries	Wald Stat.	H_0 : Rgdp does not cause Ftv *Bootstrap Crictical Values*			Wald Stat.	H_0 : Ftv does not cause Rgdp *Bootstrap Crictical Values*		
		99 th. Observation	95 th. Observation	90 th. Observation		99 th. Observation	95 th. Observation	90 th. Observation
Morocco	0.819	73.63	32.61	19.86	72.82	328.71	164.81	125.94
Algeria	1.713	128.42	84.42	54.32	2.71	73.51	45.89	26.87
Tunisia	0.559	179.66	83.43	47.09	47.3***	86.54	52.8	40.46
Benin	9.479	260.92	113.44	82.53	45.24**	55.79	44.94	32.66
R.Congo	9.531	122.55	89.52	63.38	30.42***	73.27	42.89	29.97
Ethiopia	14.791	107.51	69.55	47.28	147.12**	248.74	106.62	84.1
Côte	77.214**	120.57	62.85	39.93	7.44	161.97	81.91	48.5
Gabon	1.161	106.24	46.96	38.3	14.69	66.07	37.59	26.2
Ghana	54.891	266.21	88.15	59.62	40.71***	117.5	54.21	30.75
South	0.237	152.15	81.03	53.86	1.6	61.86	41.75	25.34
Cameroon	5.814	127.01	41.64	32.56	32.9	70.91	49.89	33.41
Kenya	5.931	136.76	99.55	41.4	41.52**	50.83	34.03	16.17
Egypt	18.594	96.56	56.48	49.04	39.35	182.07	90.48	69.89
Tanzania	46.611	216.05	87.75	50.94	52.84**	122.59	34.61	28.8
Zambia	2.096	401.52	62.72	53.9	20.72	27.49	22.23	16.16
Congo	1.271	98.07	51.7	28.77	143.92*	65.97	36.96	27.74
Sudan	5.194	92.26	70.42	45.98	6.6	69.76	36.23	21.97
Senegal	0.126	125.65	53.43	39.93	140.68**	157.08	116.69	76.59
Nigeria	0.274	95.68	52.39	36.44	11.88	60.66	48.97	30.88
Niger	1.396	115.16	40.2	28.63	6.76	74.7	34.53	18.39

*, ** and *** denote statistical significance of rejection at 10, 5 and 1%, respectively.

Critical values are based on 10,000 bootstrap replications.

Table 5(b). (Continued)

Countries	Wald Stat.	H_0 : Rgdp does not cause Bot *Bootstrap Crictical Values*			Wald Stat.	H_0 : Bot does not cause Rgdp *Bootstrap Crictical Values*		
		99 th. Observation	95 th. Observation	90 th. Observation		99 th. Observation	95 th. Observation	90 th. Observation
Morocco	2.57	63.49	45.38	34.79	79.29**	81.14	54.61	32.23
Algeria	0.8	157.42	76.99	66.24	42.54**	64.69	38.94	26.79
Tunisia	2.13	74.92	46.96	31.02	15.47	158.6	95.55	73.35
Benin	4.6	112.35	60.12	46.97	22.32	103.79	61.27	33.6
D.R.Congo	0.22	226.88	114.99	65.78	16.61	143.66	87.6	52.1
Ethiopia	0.19	112.04	70.17	42.03	320.32**	325.36	146.35	91.7
Côte	47.68***	88.12	70.57	39.45	42.17**	110.43	36.45	33.23
Gabon	8.14	53.55	38.49	25	5.46	74.51	46.84	32.2
Ghana	91.97*	69.04	51.53	42.45	5.34	76.43	21.77	11.31
South	52.27	190.81	68.06	63.87	4.52	45	17.24	12.13
Cameroon	2.31	136.06	70.26	41.82	4.28	122.42	59.71	46.05

Kenya	0.9	159.33	48.71	29.38	48.67**	49.04	20.65	15.64
Egypt	9.09	102.48	82.54	65.81	46.52**	74.34	40.14	34.71
Tanzania	44.49	101.39	75.95	60.41	13.29	102.03	54.18	43.95
Zambia	10.52	202.25	63.61	26.62	0.96	28.48	12.82	9.89
Congo	3.01	86.37	44.47	28.71	138.01*	55.87	28.42	25.62
Sudan	16.5	87.1	78.23	48.48	40.19	168.72	117.11	72.88
Senegal	0.13	60.35	40.56	28.88	147.3**	188.59	123.31	106.49
Nigeria	0.94	92.23	50.71	38.83	22.8**	29.34	16.27	8.66
Niger	1.85	160.83	45.09	28.19	10.72	58.39	36.55	28.01

*, ** and *** denote statistical significance of rejection at 10, 5 and 1%, respectively. Critical values are based on 10,000 bootstrap replications.

It can be noticed that the Wald statistics are lower than the bootstrap critical values illustrates that there is no Granger causality only except for Côte d'Ivoire for the null hypothesis. This is the only country which we handle in our study have positive balance of trade with Turkey for the whole period of 1990 to 2016. Secondly foreign trade volume of Côte d'Ivoire with Turkey increased regularly by % 22 yearly averages. Accordingly trade volume was 24 million usd in 1990 and rose to 361 million usd in 2016. Both increase in foreign trade volume and positive balance of trade comes to conclusion in bidirectional Granger causality between Rgdp and foreign trade variables in the case of Côte d'Ivoire. But as regards the causality from Ftv to Rgdp, results show that there is sufficient evidence against the null hypothesis in the case of Tunisia, Benin, Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Tanzania, Congo and Senegal, while null hypothesis can be accepted in the case of Morocco, Algeria, Côte d'Ivoire, Gabon, South Africa, Cameroon, Egypt, Zambia, Sudan, Nigeria and Niger. In table 5 (b), one-way causality, which runs from Rgdp to BoT is registered only for Côte d'Ivoire and Ghana while no Granger causality is found for the rest of the sample. On the other hand we found one way Granger causality run from BoT to Rgdp for Morocco, Algeria, Ethiopia, Côte d'Ivoire, Kenya, Egypt, Congo, Senegal and Nigeria. We can sum up results as follows;

Table 6. Summary Results for Bootstrap Panel Granger Causality Test

Countries	H_0 : Rgdp does not cause Ftv	H_0 : Ftv does not cause Rgdp	Direction of Granger Causality	H_0 : Rgdp does not cause Bot	H_0 : Bot does not cause Rgdp	Direction of Granger Causality
Morocco	Accept	Accept	*No Causality*	Accept	Reject	Unidirectional (Bot to Rgdp)
Algeria	Accept	Accept	*No Causality*	Accept	Reject	Unidirectional (Bot to Rgdp)

Tunisia	Accept	Reject	Unidirectional (Ftv to Rgdp)	Accept	Accept	*No Causality*
Benin	Accept	Reject	Unidirectional (Ftv to Rgdp).	Accept	Accept	*No Causality*
D.R.Congo	Accept	Reject	Unidirectional (Ftv to Rgdp)	Accept	Accept	*No Causality*
Ethiopia	Accept	Reject	Unidirectional (Ftv to Rgdp)	Accept	Reject	Unidirectional (Bot to Rgdp)
Côte d'Ivoire	Reject	Accept	Unidirectional (Rgdp to Ftv)	Reject	Reject	Bidirectional (Both Bot and Rgdp are in Granger Causality)
Gabon	Accept	Accept	*No Causality*	Accept	Accept	*No Causality*
Ghana	Accept	Reject	Unidirectional (Ftv to Rgdp)	Reject	Accept	Unidirectional (Rgdp to Bot)
South Africa	Accept	Accept	*No Causality*	Accept	Accept	*No Causality*
Cameroon	Accept	Accept	*No Causality*	Accept	Accept	*No Causality*
Kenya	Accept	Reject	Unidirectional (Ftv to Rgdp)	Accept	Reject	Unidirectional (Bot to Rgdp)
Egypt	Accept	Accept	*No Causality*	Accept	Reject	Unidirectional (Bot to Rgdp)
Tanzania	Accept	Reject	Unidirectional (Ftv to Rgdp)	Accept	Accept	*No Causality*
Zambia	Accept	Accept	*No Causality*	Accept	Accept	*No Causality*
Congo	Accept	Reject	Unidirectional (Ftv to Rgdp)	Accept	Reject	Unidirectional (Bot to Rgdp)
Sudan	Accept	Accept	*No Causality*	Accept	Accept	*No Causality*
Senegal	Accept	Reject	Unidirectional (Ftv to Rgdp)	Accept	Reject	Unidirectional (Bot to Rgdp)
Nigeria	Accept	Accept	*No Causality*	Accept	Reject	Unidirectional (Bot to Rgdp)
Niger	Accept	Accept	*No Causality*	Accept	Accept	*No Causality*

5. Concluding Remarks and Policy Implications

Economic growth and international trade interactions has been debated for a long time in the literature. It's believed by many researcher that international trade has positive impact on economic growth by various channels. Likewise, export-based economic growth in foreign trade has been studied in many empirical studies and they have supported positive macroeconomic conditions. So the aim of this study is empirically shed light on causality relationship between trade and growth relationship for the selected African countries which have high trade volume (export plus import) with Turkey.

Even though Turkish presence in Africa goes back to Ottoman Empire, the modern systematic approach on the economic, social, cultural and political manner is new perception and new strategy for Turkish foreign policy. This standpoint has changed especially after African Action Plan in 2005 (year of Africa). Secondly Turkey - Africa relations have gained a new momentum during the African Union's 10th Summit in 2008 (The İstanbul Declaration on Turkey - African Partnership). Accordingly, Turkey has supported business associations and development agencies to establish trade relations with continent and focused on the potential opportunities in transportation, infrastructure, energy and construction sectors. On the other side, while balance of power centre seems to be transforming unipolar to multipolarity, Africa is a rising star of global economy with regional and international economic integration, strengthen growth path, conducting structural changes. African nations may find Turkey a reliable trade partner and more useful in their foreign trade to create a fair, peaceful and more environment for their economic development.

According to trade statistics, from 1990 to 2016, Rgdp of subjected African countries rose by nearly 3 times averagely but their trade volume with Turkey increased by nearly 50 times. Especially Turkey's economic policy of opening up to Africa brought along boosting economic and trade relations over the last decade. In this frame mutual supporting of economic growth and foreign trade on the basis of Turkey-African relationship has provided evidence for various theories about international trade-economic growth interactions in the literature. International trade can have an effect on growth and the channels work in this process are well known. For example allocating of resources (allows a country to realize economies of scale and scope), facilitating the diffusion of knowledge and technology from the direct import of high-tech goods, fostering technological progress, improving productivity, encouraging competition in domestic markets and in turn these factors lead to optimization of the industrial processes, encouraging innovation power and development of new products are most known reasons. So trade volume and balance of trade are two channels may impact growth favourably in the case of Tunisia, Benin, Democratic Republic of Congo, Ethiopia,

Ghana, Kenya, Tanzania, Congo and Senegal in which we found direction of causality run from trade volume to economic growth. Also in the case of Morocco, Algeria, Ethiopia, Côte d'Ivoire, Kenya, Egypt, Congo, Senegal and Nigeria there is one way Granger causality from balance of trade to economic growth. The empirical results of this study provides policy makers a better understanding of appropriate policies to encourage trade ties and win-win strategic partnership that creates a framework for economic cooperation.

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