EXPORT DIVERSIFICATION AND ECONOMIC GROWTH: EVIDENCE FROM EMERGING EONOMIES

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ABSTRACT

Although export expansion is considered to be an important component of development strategies, how and what type of exports contributes to economic growth has been still an open question. As a matter of fact, the export promotion also does not necessarily lead to economic growth. Revealing the true effect requires considering not only macroeconomic conditions and market structure of exporting countries but also what products and services these countries export. In this context, this paper not only investigates the long run relationship between economic growth, export diversification and domestic investment using panel cointegration techniques but also examines the causal relationship between these variables employing the causality test of Konyá (2006) in 19 emerging economies for the period 1995 - 2017. Panel cointegration test results do not provide evidence of a long run relationship between the variables while Konyá's (2006) causality test reveals various results for different countries.

Keywords: Export Diversification, Panel Causality, Panel Cointegration.

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***Makalenin gönderilme tarihi: 22** Ağustos 2019* ***Kabul tarihi: 25** Şubat 2020*

İHRACAT ÇEŞİTLİLİĞİ VE EKONOMİK BÜYÜME: YÜKSELEN PİYASA EKONOMİLERİ DENEYİMİ

ÖZ

İhracat hacminin artması kalkınma stratejilerinin önemli bileşenlerinden birisi olmakla birlikte, ihracatın nasıl ve hangi türde ihracatın iktisadi büyümeye katkıda bulunduğu sıkça tartışılan bir konudur. Nitekim ihracat artışı mutlak surette ekonomik büyümeyi sağlamayabilirç İhracatın büyüme üzerindeki gerçek etkisinin ortaya konulması ekonomilerin içinde bulunduğu makroekonomik koşulların ve piyasa yapısının göz önünde bulundurulmasını gerektirdiği gibi, ihracatçı ülkelerin hangi mal ve hizmetleri ihraç ettikleri de bu manada önem arz etmektedir. Bu kapsamda, bu çalışmanın amacı 19 yükselen piyasa ekonomisinde 1995-2017 dönemi için ekonomik büyüme, ihracat çeşitliliği ve yurtiçi yatırımlar arasındaki uzun dönemli ilişkiyi panel eşbütünleşme testleri yardımıyla incelemek ve bahsi geçen değişkenler arasındaki nedensellik ilişkisini ise Konyá (2006) testini kullanarak ortaya koymaktır. Değişkenler arasında uzun dönemli bir ilişkinin varlığına işaret eden yeterli ampirik bulguya ulaşılamamakla birlikte, nedensellik testinden elde edilen bulgular ülkelere göre karma sonuçlar ortaya koymaktadır.

Anahtar Kavramlar: İhracat Çeşitliliği, Panel Nedensellik, Panel Eşbütünleşme.

INTRODUCTION

Export expansion is viewed as an important component of development strategies, and especially developing countries spend considerable attention and resources to increase their exports. This is mainly based on the virtues, arising from a number of sources, attributed to trade in promoting economic well-being in international economics and economic growth literature. Export expansion is seen as an important source of capital formation by financing imports of capital and advanced technologies. Export growth also leads to a better allocation of resources through foreign market competition, allows scale economies and larger capacity exploitation by increasing opportunity to operate in greater international markets, and thus improves the productivity of domestic industries. Exports, on the other hand, directly stimulate economic growth by increasing employment opportunities and thus raising incomes via the multiplier effect. Although the theoretical debate concerning the link between export expansion and economic growth dates back to Adam Smith and David Ricardo, empirical studies have mostly appeared after the 1980s with the acceleration of the globalization process. Nevertheless, how and what type of exports contributes to economic growth has been still an open question since then. As a matter of fact, export promotion does not necessarily lead to economic growth. To shed light on the true effect of export expansion on economic growth, one should consider

not only macroeconomic conditions and market structure of exporting countries but also what products and services these countries export. Besides, there has been and ongoing discussion in both theory and empirics regarding the channels through which exports stimulate economic well-being and even the direction of the causality between the two.

On the other hand, the stability of export revenues is another issue touched upon recent empirical studies. Especially for countries adopting export-oriented industrialization, economic vulnerability due to inconsistent export revenue structure has important ramifications on trade policies and development strategies of these countries.

High degree of export specialization may create vulnerability to commodity shocks and price fluctuations, and leads to export revenues to be volatile, which in turn results in declining imports and investment (Bleaney and Greenaway, 2001; Dawe, 1996) It also may limit the potential productivity gains from export expansion (Al-Marhubi, 2000; Feenstra and Kee, 2008). Export specialization generally implies a lower level of exports (Funke and Ruhwedel, 2001). Therefore, export promotion along export diversification is an effective tool in order to facilitate export expansion and sustain the stability of export revenues and economic growth (Volpe Martincus, 2010). Export diversification mitigates the volatility of export earnings and thus GDP growth ("portfolio effect") and induces productivity growth by increasing the opportunity to learn a high range of goods ("dynamic effect") (Agosin, 2009).

Although export diversification is considered to be an important factor in promoting economic growth from the recent theoretical perspective, as addressed below, it is clear from the literature that it is still an open question of whether and to what extent export diversification is good for economic growth. Therefore, in light of these conflicting views in the theoretical and empirical literature, we attempt to shed light on the link between export diversification and economic growth in 19 developing countries, believing that the inferences from this effort would have important policy implications.

The rest of the paper is organized as follows. A brief literature review is provided in section one, while section two introduces the data and presents the empirical analysis. Finally section five concludes the paper.

I. LITERATURE REVIEW

Several empirical studies in the trade literature have determined the importance of export diversification for long run sustainable economic growth (Agosin, 2009; Al-Marhubi, 2000; Arip, Yee and Abdul Karim, 2010; Feenstra and Kee, 2004; Greenaway, Morgan and Wright, 1999; Grossman and Helpman, 1991; Hamed, Hadi and Hossein, 2014; Krugman, 1979; Love, 1986). Aditya and Roy (2007), Cadot, Carrère and Strauss-Kahn (2011), Hesse (2008), and Imbs and Wacziarg (2003), on the other hand, document an inverted U-shaped

relationship between diversification and growth. There have also been studies revealing no significant effect of export diversification on economic growth (Ferreira and Harrison, 2012; Haddad, Lim, Pancaro and Saborowski, 2013).

Al-Marhubi (2000) examines the effect of export diversification on growth in 91 countries for the period 1961-1988. The findings document empirical evidence that export diversification promotes long term growth and the results are robust to different measures of export diversification and different model specifications. In addition, Herzer and Nowak-Lehmann (2006) test the diversification-led growth hypothesis using data on Chile. The findings suggest that export diversification is an important factor in economic growth through learning through export and the learning-by-doing. However, they note that this relationship does not always positive. Ferreira, Harrison (2012) apply the model proposed by Herzer and Nowak-Lehnmann to test the diversification induced growth hypothesis in Costa Rica for the period 1965-2006. The findings from ARDL and DOLS models indicate no long run relationship between export diversification and economic growth. Agosin (2009) employs data on emerging economies for the period 1980-2003 and argues that export diversification has a larger impact on per capita income for the countries with higher export growth. Thus, he concludes that export diversification is an important factor in explaining the different growth performance of Asian countries. Aditya and Roy (2007) employ data on 65 countries for the period 1965-2005 to investigate the effect of export composition and diversification on growth. The estimations from dynamic panel data reveal that export composition and diversification are important driving forces of economic growth. The findings also suggest a nonlinear relationship between export concentration and income. Similarly, Hesse (2008) provides robust empirical evidence that export diversification has a positive impact on per capita income growth. He argues that this effect is potentially nonlinear for developing countries performing better with export diversification whereas advanced countries benefit more from export specialization.

Finally, Michaely (1977) stresses that the positive effect of export diversification on economic growth requires a minimum of economic development. His findings reveal a close association between export diversification and economic growth only in developed countries.

II. DATA AND EMPIRICAL ANALYSIS

For the purpose of our study, we employ a panel data of 19 developing countries for the period 1995 - 2017. Table 1 lists the countries considered in this study. The variables subject to the empirical analysis are GDP (constant 2010 US$), gross fixed capital formation (constant 2010 US$) which is a proxy variable for domestic investment and diversification index. The data for GDP and gross fixed capital formation were extracted from the World Development Indicators provided by the World Bank. Product diversification index, on the

other hand, was obtained from United Nations Conference on Trade and Development (UNCTAD) and computed by measuring the absolute deviation of the trade structure of a country from world structure:

$$S_j = \frac{\sum_i |h_{ij} - h_i|}{2}$$

where h_{ij} is the share of product *i* in total exports or imports of country or country group *j* and h_i is the share of product *i* in total world exports or imports. The index takes values between 0 and 1 and a value closer to 1 indicates greater divergence from the world pattern. All the data series are transformed into a natural log prior to the analysis.

Table 1. Countries Studied

Argentina	Bangladesh
Brazil	Chile
China	Colombia
Egypt	India
Indonesia	Iran
Jordan	Malaysia
Mexico	Nigeria
Pakistan	Peru
Philippines	Saudi Arabia
Sri Lanka	

Employing panel data requires taking into consideration the homogeneity of slopes and cross sectional dependency. This is due to the fact that the choice and evaluation of unit root and cointegration tests depend on the existence of these issues (Breusch and Pagan, 1980; Pesaran, 2004). For this reason, we first test whether the slope coefficients are homogeneous or heterogeneous using the Delta test (Δ) developed by Pesaran and Yamagata (2008). The cross sectional dependency of variables and the model, on the other hand, is tested by LM (Breusch and Pagan, 1980), CDlm (Pesaran, 2004), CD (Pesaran, 2004), LMadj (Pesaran, Ullah and Yamagata, 2008) tests. Cross sectional dependency and homogeneity test results are given in Table 2 – 4.

Table 2. Delta Test Results

Test	*Test Statistics*
Delta_tilde	24.826***
Delta_tilde_adj	27.195***

Table 3. Cross Sectional Dependency in Variables

	DIV		**GDP**		**INV**	
CD Tests	***C***	***C/T***	***C***	***C/T***	***C***	***C/T***
LM (Breusch and Pagan, 1980)	234.912 (0.001)	255.404 (0.000)	296.054 (0.000)	297.296 (0.000)	228.243 (0.002)	214.416 (0.014)
CDlm (Pesaran, 2004)	3.456 (0.000)	4.564 (0.000)	6.762 (0.000)	6.829 (0.000)	3.095 (0.001)	2.348 (0.009)
CD (Pesaran, 2004)	-2.579 (0.005)	-2.082 (0.019)	-1.339 (0.090)	-1.129 (0.129)	-2.448 (0.007)	-2.153 (0.016)

Table 4. Cross Sectional Dependency in the Model

CD Tests	*Statistics*
LM (Breusch and Pagan, 1980)	621.287 (0.000)
CDlm (Pesaran, 2004)	24.349 (0.000)
CD (Pesaran, 2004)	17.679 (0.000)
LMadj (Pesaran, et al., 2008)	14.371 (0.000)

The results in Table 2 show that the slope coefficients of the variables are heterogeneous and the results in Tables 3 and 4 indicate the issue of cross sectional dependency. Therefore, we employ a second generation unit root test, CADF (Cross-Sectionally Augmented Dickey Fuller) test which takes into account cross sectional dependency and structural breaks and test results are presented in Table 5. The table also provides CIPS (Cross Sectionally Augmented IPS) statistics for the whole panel, which are the simple averages of individual CADF statistics. CADF test performs stationarity tests for each country in the panel, while the CIPS test is for the whole panel. The critical table values for both statistics are provided in Pesaran (2007). If the obtained statistics are bigger than the critical table values, the null hypothesis of a unit root in each cross section cannot be rejected. According to the results in Table 5, the variables are stationary at their first difference

Table 5. CADF Unit Root Test Results

Level/First Difference	Countries	DIV		GDP		INV	
		C	*C/T*	*C*	*C/T*	*C*	*C/T*
Level	Argentina	-1.230	-4.597**	-0.263	-3.060	-3.006	-4.156**
	Bangladesh	-3.550**	-3.830*	0.785	1.073	-0.369	-3.253
	Brazil	-0.312	-2.266	-0.993	-1.821	-1.767	-1.303
	Chile	-1.860	-1.253	-3.837**	-3.512	-1.787	-1.719
	China	-1.110	-1.521	0.449	-0.331	-1.602	-1.944
	Colombia	-2.860	-0.858	-1.297	-1.371	-0.861	-3.254
	Egypt	-2.290	-0.860	-4.454***	-4.947**	-1.319	-2.196
	India	-1.010	-3.459	-2.284	-4.052**	-1.984	-0.530
	Indonesia	-0.938	-0.934	-2.580	-2.239	0.164	-3.935*
	Iran	-2.380	-1.003	-1.482	-1.399	0.770	-1.678
	Jordan	-1.780	-2.720	-1.893	-0.883	-3.252**	-3.557*
	Malaysia	-0.526	-2.034	-1.689	-2.154	-5.513***	-5.298***
	Mexico	-2.100	-3.591*	-3.425**	-2.554	-3.069*	-3.618*
	Nigeria	-1.950	-1.154	-1.944	-1.708	-0.538	-2.108
	Pakistan	-1.700	-1.538	-0.802	-1.934	-2.034	-2.321
	Peru	-0.414	-2.241	-0.843	-3.174	-3.935**	-2.535
	Philippines	-2.820	-2.827	0.932	0.306	-1.559	-3.909*
	Saudi Arabia	-1.190	-2.837	-1.753	-1.705	-2.005	-2.987
	Sri Lanka	-1.770	-1.487	-2.549	-1.605	-3.415*	-4.189**
	CIPS Statistics	***-1.670***	***-2.158***	***-1.575***	***-1.951***	***-1.952***	***-2.868****
First Difference	Argentina	-5.850***	-6.374***	-2.233	-2.089	-4.167**	-4.088**
	Bangladesh	-4.265**	-4.305**	-1.160	-1.828	-2.852	-2.557
	Brazil	-3.944**	-4.079**	-2.105	-2.603	-1.935	-2.033
	Chile	-4.638***	-4.896**	-2.110	-3.174	-3.709**	-3.736*
	China	-2.115	-2.458	-1.314	-2.764	-2.785	-3.251*
	Colombia	-3.238*	-3.227	-2.301	-2.800	-3.047*	-2.934
	Egypt	-1.930	-2.154	-2.542	-2.929	-2.814	-2.673
	India	-3.630**	-3.467	-3.217	-3.212	-1.283	-1.843
	Indonesia	-2.902	-3.513	-2.775	-4.379**	-1.965	-2.076
	Iran	-2.554	-1.426	-2.364	-2.080	-2.678	-2.946
	Jordan	-2.290	-2.312	-1.173	-2.831	-3.787**	-3.678*
	Malaysia	-2.866	-3.254	-4.510**	-5.358***	-3.356*	-3.351
	Mexico	-3.041*	-2.950	-3.660	-2.501	-2.906	-2.951
	Nigeria	-2.721	-2.844	-1.135	-1.230	-3.433**	-3.345
	Pakistan	-1.902	-1.745	-1.703	-1.641	-2.698	-2.599
	Peru	-4.394***	-6.671***	-3.563*	-3.649*	-2.411	-3.066
	Philippines	-5.738***	-5.150***	0.047	-2.699	-4.020**	-3.733*
	Saudi Arabia	-4.882***	-5.766***	-3.358	-3.211	-3.308*	-3.498
	Sri Lanka	-2.609	-3.140	-2.844	-2.727	-2.302	-2.642
	CIPS Statistics	***-3.448****	***-3.670****	***-2.317****	***-2.827****	***-2.919****	***-3.000****

Notes: The optimal lag lengths were determined according to the Schwarz information criteria (SIC) where the maximum lag length is set as 3. Critical values of individual CADF distribution (Case II: intercept only) are -4.32 (%1), -3.42 (%5) and -3.01 (%10) (Pesaran 2007, Table I(b), p:275); and (Case III: intercept and trend) -4.96 (%1), -4.00 (%5) and -3.55 (%10) (Pesaran 2007, table I(c), p:276). Critical values of average of individual CADF distribution (Case II: intercept only) are -2.40 (%1), -2.21 (%5) and -2.10 (%10) (Pesaran 2007, Table II(b), p:280); and (Case III: intercept and trend) -2.92 (%1), -2.73 (%5) and -2.63 (%10) (Pesaran 2007, Table II(c), p:281). **, **, and * denote statistical significance at the 1, 5, and 10% level of significance, respectively.

In order to reveal the cointegrating relationship between the variables, we adopt Westerlund (2007) cointegration test and the Durbin Hausman test developed by Westerlund (2008). The results are summarized in Table 6 and both tests provide similar results indicating that the null hypothesis of no cointegration cannot be rejected. This implies no long run relationship between the variables in some countries in the sample.

Table 6. Cointegration Test Results

Westerlund (2007)	***C***	***C/T***
Ho: No cointegration	***Test Statistics***	***Test Statistics***
G-tau	8.56 (1.000)	-1.357 (0.863)
G_alpha	5.377 (1.000)	-7.349 (0.001)
Westerlund (2008) Durbin Hausman Cointegration Test		
Ho: No cointegration		
dh_g	-0.546 (0.293)	0.321 (0.626)

Regarding the causality among the variables, we employ a panel Granger causality testing approach introduced by Kónya (2006) which can be adopted even in the case of no cointegration. This approach allows one to account for both the heterogeneity and the cross sectional dependency and does not require the tests for panel unit root and cointegration (Kónya, 2006). The results of the bootstrap panel Granger causality tests are presented in Table 7 – 9. Overall, the findings favour mixed results indicating that export diversification could play an important role in Chile, Colombia, Jordan, Pakistan and Peru, whereas there is a one way causality from economic growth to diversification in Argentina, Bangladesh, Egypt and Iran. Brazil, China, India, Indonesia, Malaysia, Mexico, Nigeria, Philippines and Saudi Arabia are the countries that show a two-way causality and no causality seems to exist in Sri Lanka. Results also indicate that diversification is also an important factor for gross fixed capital formation in Iran and Sri Lanka, while the causality is the other way around in Mexico. For the rest of the countries there is bidirectional causality between export diversification and domestic investment. Regarding the investment – GDP nexus, except for Brazil, China, Egypt, Jordan and Pakistan in which the causality goes from investment to economic growth and Colombia in which the causality is the other way around, the other countries indicate bidirectional causality between investment and economic growth.

Table 7. Bootstrap Panel Causality Test Results (GDP – DIV)

	Ho: GDP does not cause DIV		Ho: DIV does not cause GDP	
Countries	***Wald Statistics***	***Bootstrap Probability Value***	***Wald Statistics***	***Bootstrap Probability Value***
Argentina	37.4581	0.0000	1.1417	0.2853
Bangladesh	15.4667	0.0001	1.3597	0.2436
Brazil	9.9916	0.0016	60.2105	0.0000
Chile	0.2943	0.5875	12.6010	0.0004
China	8.8322	0.0030	19.5417	0.0000
Colombia	1.9798	0.1594	28.3855	0.0000
Egypt	58.6616	0.0000	0.0161	0.8991
India	215.8412	0.0000	2.8094	0.0937
Indonesia	15.8290	0.0001	408.1653	0.0000
Iran	37.0463	0.0000	0.2912	0.5895
Jordan	2.5936	0.1073	72.8071	0.0000
Malaysia	58.5435	0.0000	92.7338	0.0000
Mexico	26.3967	0.0000	17.4154	0.0000
Nigeria	5.5095	0.0189	65.9175	0.0000
Pakistan	2.3454	0.1257	184.5916	0.0000
Peru	2.3451	0.1257	31.1205	0.0000
Philippines	168.1073	0.0000	51.1971	0.0000
Saudi Arabia	23.5956	0.0000	15.9760	0.0001
Sri Lanka	2.3093	0.1286	1.5125	0.2188

Table 8. Bootstrap Panel Causality Test Results (INV – DIV)

	Ho: INV does not cause DIV		Ho: DIV does not cause INV	
Countries	***Wald Statistics***	***Bootstrap Probability Value***	***Wald Statistics***	***Bootstrap Probability Value***
Argentina	3.5136	0.0609	74.5414	0.0000
Bangladesh	14.8839	0.0001	1673.7836	0.0000
Brazil	26.0099	0.0000	60.4625	0.0000
Chile	4.8541	0.0276	118.9759	0.0000
China	12.4723	0.0004	10.8610	0.0010
Colombia	43.8680	0.0000	58.7721	0.0000
Egypt	68.5154	0.0000	63.9565	0.0000
India	9.3758	0.0022	6.7015	0.0096
Indonesia	30.1166	0.0000	1412.7373	0.0000
Iran	0.2924	0.5887	26.7147	0.0000
Jordan	19.3368	0.0000	44.7874	0.0000
Malaysia	22.9964	0.0000	56.3066	0.0000
Mexico	38.4788	0.0000	0.0077	0.9302
Nigeria	6.2920	0.0121	9.9011	0.0017
Pakistan	33.3494	0.0000	21.6965	0.0000
Peru	48.3059	0.0000	484.1853	0.0000
Philippines	38.2424	0.0000	40.4136	0.0000
Saudi Arabia	3.6449	0.0562	1145.4221	0.0000
Sri Lanka	0.4854	0.4860	333.4114	0.0000

Table 9. Bootstrap Panel Causality Test Results (GDP – DIV)

	Ho: INV does not cause GDP		**Ho: GDP does not cause INV**	
Countries	***Wald Statistics***	***Bootstrap Probability Value***	***Wald Statistics***	***Bootstrap Probability Value***
Argentina	38.1311	0.0000	2.7150	0.0994
Bangladesh	16.5584	0.0001	79.3447	0.0000
Brazil	5.4326	0.0198	0.3544	0.5516
Chile	3161.1562	0.0000	3.6203	0.0571
China	2461.6180	0.0000	0.0356	0.8504
Colombia	2.4012	0.1212	7.6763	0.0056
Egypt	8.9496	0.0028	1.5105	0.2191
India	39.5194	0.0000	7.2438	0.0071
Indonesia	241.6099	0.0000	310.6248	0.0000
Iran	128.1401	0.0000	46.0518	0.0000
Jordan	540.3384	0.0000	1.9529	0.1623
Malaysia	491.8900	0.0000	17.2511	0.0000
Mexico	1461.6089	0.0000	62.4373	0.0000
Nigeria	60.0205	0.0000	212.6313	0.0000
Pakistan	231.1171	0.0000	0.5356	0.4643
Peru	194.6376	0.0000	14.9392	0.0001
Philippines	148.5469	0.0000	11.8380	0.0006
Saudi Arabia	8.5483	0.0035	52.0165	0.0000
Sri Lanka	1067.9618	0.0000	10.5914	0.0011

CONCLUSION

In this study we investigate the existence of a long run relationship between export diversification and economic growth as well as the direction of causality between the two. In order to do so, we employ panel cointegration techniques and the causality test of Konyá (2006) and use data on 19 emerging economies for the period 1995-2017. The empirical evidence suggests no long run relationship between export diversification and economic growth. In this sense, the empirical evidence is not in accord with the findings of the previous literature (Aditya and Roy, 2007; Agosin, 2009; Al Marhubi, 2000). These conflicting may arise from the fact that the positive effect of export diversification on economic growth requires a minimum of economic development as emphasized by Michaely (1977) revealing a close association between export diversification and economic growth only in developed countries. On the other hand, it can be argued that since the price volatility differs across different products, the composition of exports may well play an important role in diversification-growth nexus. In other words, an export diversification strategy that results in the change in the share of products that have different price volatilities may induce different effects on economic growth.

The results also document that the direction of causality varies across the countries. This finding may signal many aspects of the association between the variables. The different results may again arise from the fact that all these countries are at different levels of economic development. In addition, the countries under consideration may have specific characteristics that should be considered during the analysis such as natural resource scarcity, export levels or quality of exports etc. Therefore, future studies should focus more on country specific effects. Another direction for future analyses could be deeply taking into account the nonlinear relationship between export diversification and economic growth and the possibility of turning point (threshold) where the relationship goes the other way around.

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