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TEST OF EXPORT-LED GROWTH HYPOTHESIS: A COMPARATIVE ANALYSIS ON TURKEY AND NEWLY DEVELOPING COUNTRIES

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Abstract. The relation between exports and national income of a country has long been a frequently debated issue in both trade and growth theory. This issue is particularly important in providing arguments for '*free trade*' (export-led growth) or '*protectionism*' (import substitution) because presence of any causality between exports and income would imply supremacy of outward looking policies over inward looking policies. In order to test the export-led growth hypothesis, this work examines the relation between trade (exports and imports) and income for Turkey and seven newly developing countries using Granger causality analysis. Our results suggest that the export-led growth hypothesis is not supported only in cases of Argentina, and Brazil and that there is a strong unidirectional causality running from exports to growth for Turkey, the Czech Republic, Hungary, Poland, India and China.

Keywords*:* export-led growth, import substitution, Granger causality analysis

1. Introduction

Turkey had followed the so-called "import substitutive" policies based on protectionism since the early 1960s in planned development period. However, there has been a radical change in trade regime of the country after the so-called "24 January Decisions" in 1980. Instead of "import substitutive" policies, Turkey relied on free trade regime and has begun to implement "export-led growth model" since the 1980s.

The main factor lying under such a fundamental change was the expectation for a similar increase in national income parallel to rapid export growth by the reason of the foresighted strong relation between export and growth. That the countries such as Singapore, Taiwan and South Korea achieved a quite high growth rate by following free trade policies, was the main support of this expectation. As a result, export-led growth became an alternative policy recommendation in that period for Turkey and many developing countries.

The basic object of the study is to test validity of the export-led growth empirically for Turkey and seven newly developing countries. For this purpose, beside Turkey, the Czech Republic, Hungary and Poland, which started market economy by making a fundamental regime change in the early 1990s, were examined. We also analyze Argentina and Brazil, which have been following outward-oriented policies for a long time; as well as India and China which have increased their exports significantly and are most rapidly growing countries in recent years. In order to examine the relation between exports and national income, we use the Granger Causality analysis, which is one of the most frequently used methods for this purpose.

The paper is organized as follows. First, theoretical discussions on the relation between foreign trade and national income are summarized, then, the results obtained from the studies intended for testing the thesis of export-led growth are presented. After the fourth section in which we study trend of exports and national income in Turkey and the other seven countries, we introduce the methodology used in the study and our empirical results are given in the fifth section. Finally, the findings obtained from the study are evaluated in the conclusion section.

2. Relation between Foreign Trade and National Income

2.1. Theoretical Evaluation

The relation between economic growth and trade occupies an important place in the growth and development literature. For being able to carry out economic growth, it is generally accepted to achieve a long-term and high national income growth rate. It is also a well known argument that,

among many other factors, foreign trade plays a crucial role to reach economic growth. Smith and Ricardo were the first philosophers, who emphasized the importance of foreign trade in economic analysis. Ricardo argued that if each country specialized on producing the goods at which it had a comparative advantage and export these goods, it would achieve a higher welfare level compared with the pre-trade (autarky) position (Chang and Grabel, 2004:80-81).

The claim of "foreign trade is the engine of growth" started by A. Smith lost its popularity for a long time in the 20th century. Therefore, developing countries were kept under pressure of protectionist policies, as a result of this process most of them followed outward-oriented industrializing policies only up to a limited degree.[1] During 1950s, 1960s and 1970s, many development economists adopted the protectionist idea and many serious studies concentrated on this field. The 1980s had an important role for renewing political views on long-term growth and development strategies.

Debt crises, which appeared in these years, forced many developing countries to liberalize their foreign trade regimes and made it clear that inward-oriented policies followed by most of developing countries since the Second World War could not be retained anymore. During this period, foreign trade liberalization was demanded as a prerequisite to receive financial support for developing countries by the international institutions such as Economic Consortium of Latin America (ECLA), which was the most eager supporter of protectionist policies, World Bank (WB) and International Monetary Fund (Edwards, 1993).

Although the importance of international trade for growth of a country has been described theoretically a long time ago, empirically testing and verification of this relation have been done very recently. Systematic and empirical studies, which have tested the relation between growth and trade, have been performed in last thirty years (Love and Chandra 2005:1156).

The fact that developing Latin American countries which followed import substitution industrializing strategies had relatively lower growth rates, while Asian countries which applied export-led growth policies had quite high growth performances, may explain why most empirical and theoretical studies have been intended to examine the relation between trade liberalization and economic performances of developing countries since the late 1970s. Most of researchers considered the export-led policies as the first explanation for quite high growth performances of Asian countries.

The view, which is called as "export-led growth hypothesis" and claims that the growth in the export is the basic characteristic of production and employment growth of an economy, is supported by three basic claims. First of them is a Keynesian view and claims that, the growth in the export creates an expansion in manufacturing volume through the foreign trade multiplier (Ramos 2001:613)[2]. According to the second view, it is claimed that, currency obtained from export is used for the import of capital goods and therefore causes economic growth[3]. According to the third thesis, the volume and the competition in the export market causes scale economies as well as technologic development and spillovers in production[4].

2.2. Numeric Evaluation

For mathematically expression of the relation between foreign trade and national income, the export of a country is analyzed in the similar way to that of production function. Therefore, the impact of the exports on economic growth is tried to be tested in the framework of a simple production function model. The national income is expressed as follows by using total production function (Ram 1985:417):

$$Y = f(L, K, X), \tag{1}$$

here, Y stands for total real output (production); L – for labor; K – for capital; X – for export. When the function is re-written by terms of growth rates,

$$\dot{Y} = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 X. \tag{2}$$

A similar expression is formed when it is written by taking total derivatives. The points put on the variables indicate the growth rates and β_0, β_1, and β_3 give output elasticity according to L, K and X. When $\frac{\Delta K}{Y}$ is used instead of $\dot{K}$ (capital growth rate) equation (2) takes the following form[5]:

$$\dot{Y} = \beta_0 + \beta_1 \dot{L} + \frac{\partial Y}{\partial K} \cdot \frac{K}{Y} \cdot \frac{dK}{K} + \beta_3 \dot{X}, \tag{3}$$

and if we write I instead of dK:

$$\dot{Y} = \beta_0 + \beta_1 \dot{L} + \alpha_2 \frac{I}{Y} + \beta_3 \dot{X}. \tag{4}$$

In equation (4), α_2 shows marginal physical output of the capital. As a result, if the model has appropriate cha-

[1] These policies called as "import substitutive industrializing strategies" are based on theses of Prebisch (1950) and Singer (1950).

[2] Levine and Renelt (1992) claims that there is a positively directed and strong correlation between investment share and growth in income as well as trade shares and investment and that trade affects growth via investments.

[3] See Moosa and Choe (1998:237) and Ramos (2001:614) for further discussion on this argument.

[4] For further discussion see Helpman and Kruman (1985), Bhagwati and Srinivasan (1979) and Krueger (1980).

[5] $\frac{\Delta K}{Y}$ gives approximate investment/income ratio. The reason for using $\frac{\Delta K}{Y}$ is that K is not known for many countries.

racteristics, the predicted coefficient of $\dot{X}(\beta_3)$ will indicate magnitude and direction of the effect of an increase in export on economic performance.

3. Empirical Studies Intended For Testing Export-led Growth Thesis

In 1970s and 1980s, the relation between export and growth were examined in many econometric studies. The view that the growth in export creates a comprehensive economic growth was supported by studies of Michaely (1977), Balassa (1978), Krueger (1978), Heller and Porter (1978), Ram (1985 and 1987), Thornton (1996) and Frankel and Romer (1996).

Michaely (1977) examined the relation between annual growth in GNP per capita and annual increase of the export share in GNP in his study covering 41 underdeveloped countries and claimed that the increase in export causes accelerate economic growth. The result obtained from this study carried out in the years of 1950-73 is that although the relation between the export performance and the economic growth is positive, this relation is stronger in the countries, which GNP per capita is higher than 300 dollars.

Another study examining the effect of foreign trade regimes on economic growth is the work of Krueger (1978) and covers the period of 1954–71. Krueger (1978) examined the effect of the export on the GNPs of 10 selected countries and obtained the result that, "the effect of the increase of 1 % in the export growth on national income growth rate is approximately 1 %".

Balassa (1978) examines the effect of increase in export on the economic performance for 11 countries in two sub-periods (1960–66 and 1966–73) and he finds a positive relation between the increase in the export and the economic performance.

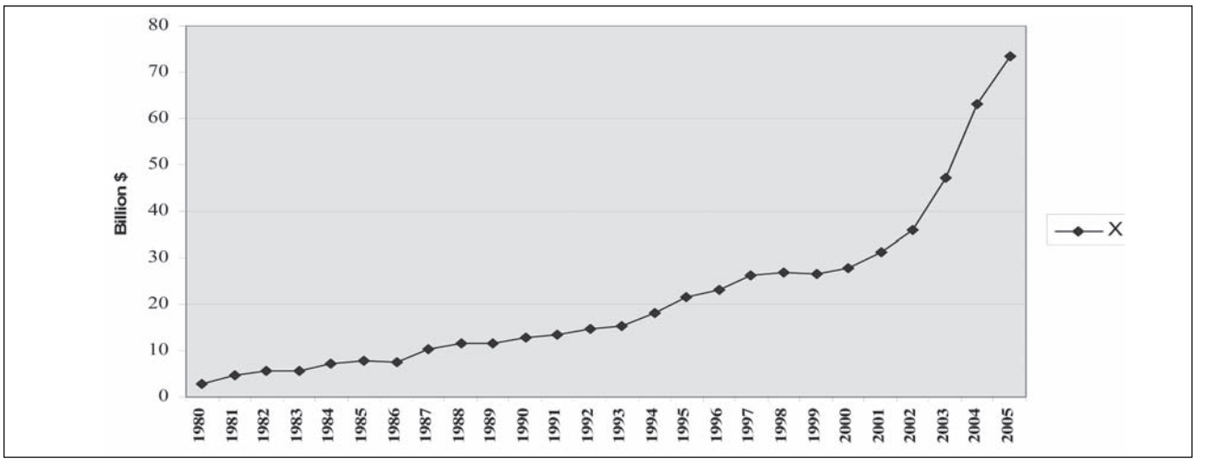
Ram (1985) uses a quite big sample covering 73 underdeveloped countries in periods of 1960–70 and 1970–77. Although he emphasizes that the export performance has an important effect on the economic growth, he indicates that this effect is low in the period of 1960–70 for low-income underdeveloped countries and that it is positive and almost equal for two groups of countries in the period of 1970–77.

In the 1980s and 90s many studies examined the causality relation between the export and the growth by using Granger (1969) and Sims (1972) methods. Mixed results were obtained in studies of Chow (1987), Jung and Marshall (1985), Bahmani-Oskooee, Mohtadi and Shabsigh (1991), Afxentiou and Serletis (1991), Bahmani-Oskooee and Alse (1993), Love and Chandra (2005)[6] . While the works of Bahmani-Oskooee and Alse (1993) and Chow (1987) support the hypothesis very strongly, studies of Jung and Marshall (1985), Afxentiou and Serletis (1991), Bahmani-Oskooee, Mohtadi and Shabsigh (1991) and Love and Chandra (2005) do not support the export-led growth thesis[7].

4. Development of exports and national income in the examined countries

4.1. Exports in Turkey 1980–2005

An import substitution-led growth strategy was followed in Turkey until the 1980s. After the 1980s, foreign trade became free. Increasing exports and reducing foreign trade deficit became the first priority of the economy policies, which were followed through a permanent devaluation strategy and intensive export promotions. Although in the period of post-1980, an increase in exports was obtained for a short time, and then a fluctuating trend dominated the growth of exports. The growth of the exports in Turkey in the period of 1980–2005 is shown in Fig 1.



Source: SIS (2004) and TUIK.

Fig 1. Trend of Turkey's Exports 1980–2005

[6] See Love and Chandra (2005: 1156) for a brief review of empirical results.

[7] Moosa and Choe (1998: 238).

The trend of export growth in Turkey after the 1980s can be examined in 6 periods as follows:

a) 1980–1987; High performance years: Total exports of Turkey, which was only 2.9 billion dollars in 1980, reached over 10 billion dollars by an annual average increase of 43.8 percent in 1987. The exchange rate of dollar was risen up from 47 TL to 70 TL on 24 January 1980 and then up to 1.018 TL at the end of the period.[8]

b) 1988–1993; Stumbling: In this period, in which financial liberalization came to the fore, total exports rose up from 11.6 billion dollars in 1988 to 15.3 billion dollars in 1993 and the average annual increase was only 5.3 percent. Exchange rate of dollar, which was 1.813 TL in 1988, was risen up to 14.458 TL at the end of the period.

c) 1994–1997; Reacceleration: By 1994, current deficit and public deficit reached to a level, which threatened macroeconomic balances. Therefore, as a result of so called '5 April Decisions', exchange rate of dollar rose up from 19,000 TL in January 1994 to 38,000 TL in April. As response to this significant change in exchange rate, total exports rose up from 18.1 billion dollars in 1994 to 26.2 billion dollars in 1997 by an annual average increase of 11.2 percent.

d) 1998–2000; Re-stagnation: This period was under the effects of Asia (1996) and Russia (1997) crises as well as the Marmara earthquake (1999). Exports tended to decline again and reached from 26.9 billion dollars to only 27.7 billion dollars in 2000, by an annual average increase of 1.45 percent.

e) 2001–2004; Reacceleration: This period is remembered for so-called February 2001 Crisis, however, total exports reached over 30 billion dollars for the first time in spite of the crisis. Further more, despite overvaluation of Turkish Lira, exports rose up to 63 billion dollars in 2004. Annual average export growth rate was 25.2 percent.

f) 2005 and thereafter; Beginning of the deceleration: Although exports exceeded 73 billion dollars by an increase of approximately 16 percent in 2005, total export is expected to reach 79 billion dollars by an increase of just 7 percent in 2006.

4.2. National Income in Turkey, 1980–2005

For the periods taken into account, level and annual growth of national income (Gross Domestic Product-GDP), average GDP and average growth rate, as well as average growth rate excluding crisis years and total growth rates for each period, are given in Table 1, Fig 2.

[8] For evaluations on currency exchange rate, Celebi (2001: 64) and Central Bank of Republic of Turkey (CBRT) data were taken into consideration. As a result of the low-wage policy implemented during this period, the domestic demand was reduced and companies were directed toward foreign demand. This policy also lowered production cost of Turkish firms and therefore played a crucial role in the significant increase of exports.

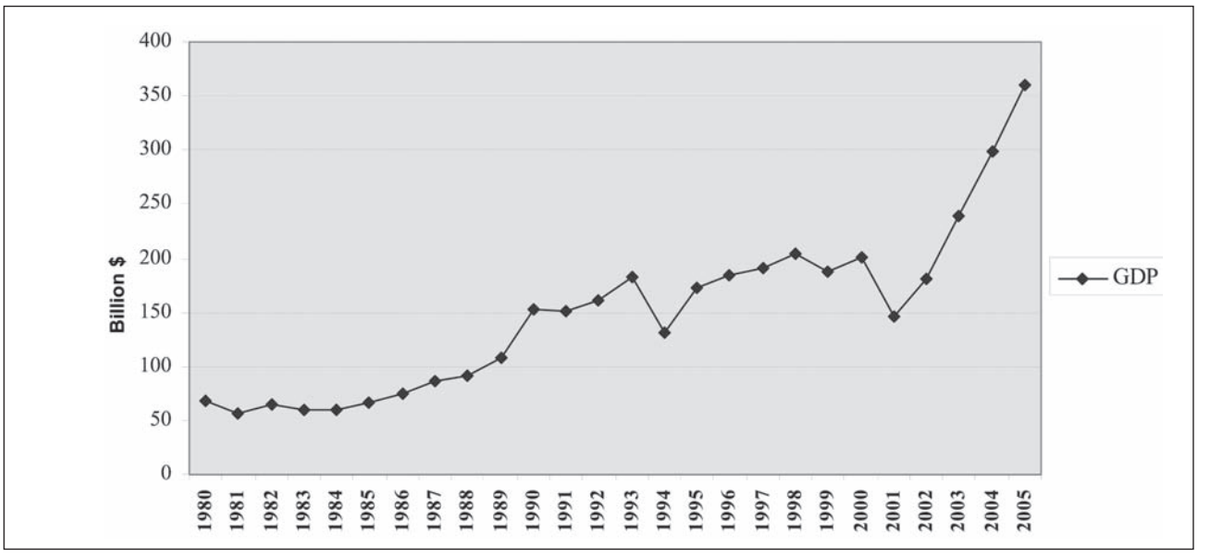
In the first period, which covers 1980–1987, while average national income level was 77 billion dollars; average growth rate was 4.6 percent. When the year of 1980, in which the September 12 Military Intervention occurred, is excluded out, average growth rate rose up to 5.7 percent. Consequently, it is seen that, national income also grew at quite high rates parallel to the large increases in exports during this period.

The second period covers 1988–1993 and no financial

Table 1. GDP and growth in Turkey, 1980–2005

	GDP (Billion $)	Annual Growth of GDP (%)	Average GDP (Billion $)	Average Growth (%)	Average Growth, excluding crisis (%)	Total Growth in all period (%)
1980	68,4	–2,8				
1981	56,4	4,8				
1982	64,2	3,1				
1983	60,5	4,2				
1984	59,1	7,1				
1985	66,9	4,3				
1986	75,1	6,8				
1987	85,9	9,8				
1980–1987 Period			77,1	4,6	5,7	25,7
1988	90,4	1,5				
1989	107,5	1,6				
1990	152,0	9,4				
1991	151,7	0,4				
1992	160,2	6,4				
1993	181,8	7,9				
1988–1993 Period			136,1	4,5	No crisis	101,0
1994	130,9	–6,1				
1995	171,9	8				
1996	184,6	7,1				
1997	191,1	8,3				
1994–1997 Period			161,0	4,3	7,8	46,0
1998	204,7	3,8				
1999	187,0	–6,1				
2000	200,4	6,3				
1998–2000 Period			202,6	1,3	5,05	–2,1
2001	145,7	–9,5				
2002	180,9	7,9				
2003	239,2	5,9				
2004	299,4	9,9				
2001–2004 Period			222,5	3,5	7,9	105,6
2005	360,9	7,6				
1980–2005 Period			149,1	4,1	6,0	528,4

Source: Calculated using data from SIS (2004) and TUIK.



Source: *State Institute of Statistics, SSI (2004) and TUIK.*

Fig 2. Trend of Turkey's GDP, 1980–2005

crisis was experienced. Average national income of Turkey reached over 136 billion dollars with an average growth rate of 4.5 percent. Despite deceleration in exports, national income went up from 90 billion dollars in 1988 to over 181 billion dollars in 1993.

The period of 1994–1997 is remembered for 1994 in which so-called 5 April Decisions were taken. During this period while national income dropped down quite below its level of 181 billion dollars in 1993, the average growth rate was still as high as 4.3 percent due to the outstanding recovery obtained in 1995–1997 period. Throughout this post-crisis period, the average growth rate of national income was 7.8 percent. It can be argued that the significant devaluation imposed by the 5 April Decisions and resulting increases in exports played an important role in this fast growth of income.

1999 Marmara earthquake, which was experienced in the period of 1998–2000, caused serious shortages on production and the national income dropped down from 205 billion dollars in 1998 to 187 billion dollars in 1999 and average growth rate went down to 1.3 percent. When the crisis period was not taken into account, average growth rate was 5.5 percent in this period. National income decreased by totally 2.1 percent during the period by the effects of 1999 Marmara earthquake and the stagnation in the exports.

The period of 2001–2004 is remembered for the February 2001 crisis which caused the national income to drop by as much as 9.5 percent. While average growth obtained during the period was 3.5 percent, the overall growth rate of 7.9 percent excluding the February 2001 crisis was the highest among all the periods examined.

Although it was predicted that the growth would be decelerated by the global uncertainties particularly due to rapid increases in oil prices, a surprisingly high growth rate of 7.6 percent was obtained in 2005. Even though a growth rate of 5 percent was aimed for 2006, national income of Turkey increased by 7.5 percent in the first 6-month period (January–June 2006), according to the data of TUIK.

4.3. Exports and National Income in the Other Countries, 2000–2005

The development of exports and national income in the seven countries examined for the period of 2000–2005 is given in Table 2 and Figs 3–9. It is possible to make the following evaluations about the relation between foreign trade and national income in Argentina, Brazil, the Czech Republic, China, India, Hungary and Poland using the data in Table 2 and Figs 3–9:

a. Although serious fluctuations were experienced in national income of Argentina and Brazil, their exports remained to increase.

b. National income increased by almost two-fold in the Czech Republic, China and Hungary in the six-year period examined and these countries obtained quite steady growth levels especially after 2003.

c. In general, the trend of increase in the exports has been much more than in the national income. Given threefold increases in exports, Poland and China appear to be the most successful countries in terms of their performance to boost exports.

d. National income and export performances of the Czech Republic, China, India, Hungary and Poland accelerated after their full membership to the European Union in 2004.

Table 2. GDP and exports in other countries; 2000–2005[1]

	2000		2001		2002		2003		2004		2005	
	GDP	X	GDP	X	GDP	X	GDP	X	GDP	X	GDP	X
Argentina	275,5	26,3	261,3	26,5	152,2	25,5	139,5	29,4	137,2	34,1	173	40
Brazil	623,8	54,9	535,3	57,8	499,8	60	486,9	72,7	551,6	94,5	644,1	118,3
Czech R.	58,4	29,1	57,8	33,3	60	38,5	73,1	48,7	93,6	69,0	109,1	78,5
China	1168,8	249,2	1273,2	266	1406,8	325,5	1631,4	438,2	1937,9	593,3	2263,8	761,9
India	457,6	45,2	479,7	44,3	492,4	52,4	567,1	63	680,3	79,8	793	97,3
Hungary	47	28,2	48,4	30,4	52,5	34,5	65,1	43,1	84,5	55,6	101,1	62,2
Poland	175,5	31,7	177,7	36,0	184,3	41,1	207,6	53,8	234,4	75,0	271,4	88,9

Source: World Bank, World Development Indicators.

[1] *Billion dollars.*

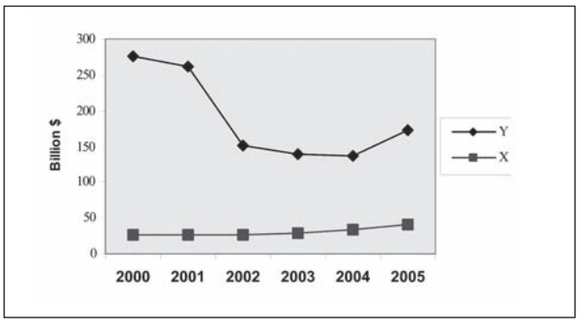


Fig 3. Trend of GDP and Exports in Argentina

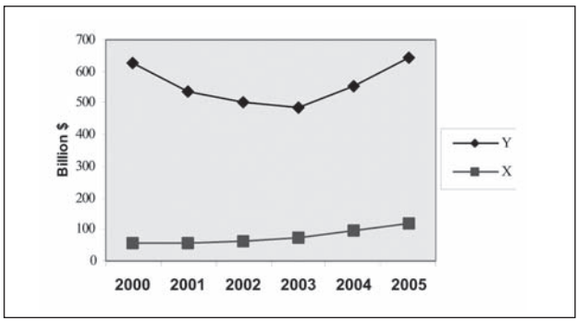


Fig 4. Trend of GDP and Exports in Brazil

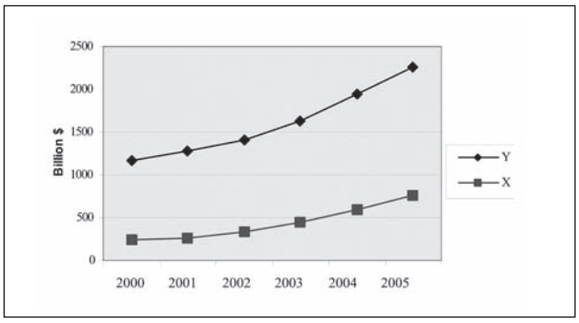


Fig 5. Trend of GDP and Exports in China

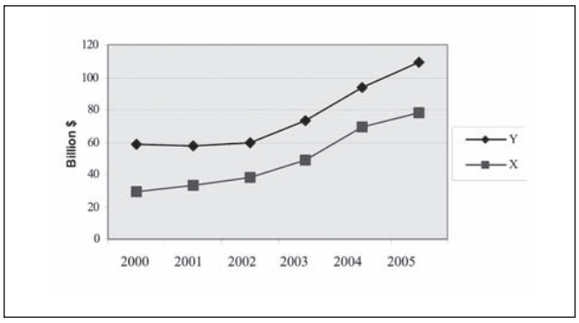


Fig 6. Trend of GDP and Exports in Czech Republic

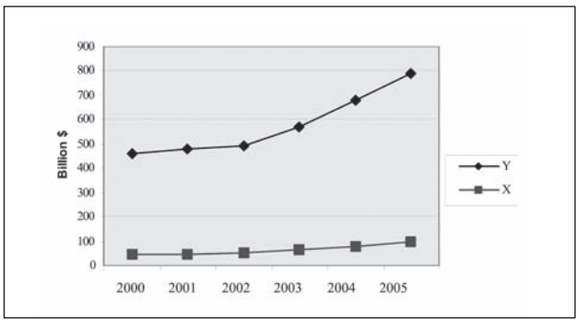


Fig 7. Trend of GDP and Exports in India

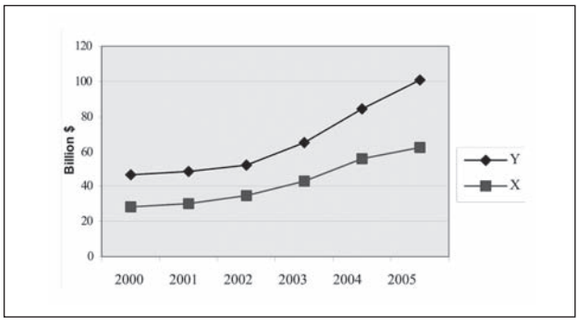


Fig 8. Trend of GDP and Exports in Hungary

Source: World Bank, World Development Indicators.

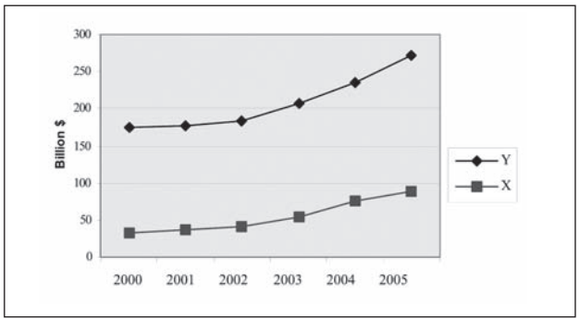


Fig 8. Trend of GDP and Exports in Poland

5. Method and Empirical Results

5.1. Stationarity of variables

To test export-led growth hypothesis, the relation between exports and national income was analyzed by using Granger causality test for eight countries consisted of Turkey, the Czech Republic, Hungary, Poland, Argentina, Brazil, India and China. Furthermore, the relation between imports and exports as well as imports and national income was also examined and the general relation between foreign trade and national income was questioned from different points of view. Because of the differences between the data sources, the observation periods are: 1980–2005 for Turkey; 1992–2005 for the Czech Republic, Hungary, Poland; 1980–2004 for Argentina, Brazil, India; and 1984–2005 for China.

First, unit root tests were performed by using ADF (Augmented Dickey-Fuller) tests to examine the stationarity of export, import and national income variables. The results of ADF tests are given in Table 3. We understand from Table 3 that the twice differentiated variables are second order stationary [I (2)] at 5 and 10 percent significance levels.

5.2. The results of causality test

The data relating to the hypothesis, Granger causality test results, P value and the direction of causality, which

Table 3. Stationarity Analysis, Results of Unit Root Tests

Country (Period)	Değişken	Result of ADF Test	ADF critical value	Result of Stationarity Test[1]
Turkey (1980–2005)	Exports (TX)	–4,2959	% 5 → –2,9969 %10 → –2,6381	Stationary I(2), % 5
	GDP (TY)	–3,9018		Stationary I(2), % 5
	Imports (TM)	–2,6567		Stationary I(2), % 10
Czech Republic (1992–2005)	Exports (CzX)	–3,7537	% 5 → –3,1801 %10 → –2,7349	Stationary I(2), % 5
	GDP (CzY)	–4,9757		Stationary I(2), % 5
	Imports (CzM)	–3,5288		Stationary I(2), % 5
Hungary (1992–2005)	Exports (HX)	–2,8728	% 5 → –3,1801 %10 → –2,7349	Stationary I(2), % 10
	GDP (HY)	–3,2284		Stationary I(2), % 5
	Imports (HM)	–2,7505		Stationary I(2), % 10
Poland (1992–2005)	Exports (PX)	–4,1099	% 5 → –3,1801 %10 → –2,7349	Stationary I(2), % 5
	GDP (PY)	–3,1936		Stationary I(2), % 5
	Imports (PM)	–2,9077		Stationary I(2), % 10
Argentina (1980–2004)	Exports (AX)	–3,1865	% 5 → –3,0038 %10 → –2,6417	Stationary I(2), % 5
	GDP (AY)	–3,4690		Stationary I(2), % 5
	Imports (AM)	–3,4883		Stationary I(2), % 5
Brazil (1980–2004)	Exports (BX)	–6,5577	% 5 → –3,0038 %10 → –2,6417	Stationary I(2), % 5
	GDP (BY)	–2,7538		Stationary I(2), % 10
	Imports (BRM)	–4,2706		Stationary I(2), % 5
India (1980–2004)	Exports (IX)	–3,3267	% 5 → –3,0038 %10 → –2,6417	Stationary I(2), % 5
	GDP (IY)	–3,1841		Stationary I(2), % 5
	Imports (IM)	–4,5100		Stationary I(2), % 5
China (1984–2005)	Exports (CX)	–2,6970	% 5 → –3,0400 %10 → –2,6608	Stationary I(2), % 10
	GDP (CY)	–5,2206		Stationary I(2), % 5
	Imports (CM)	–3,2654		Stationary I(2), % 5

Source: Foreign trade statistics are obtained from the United Nations Comtrade Statistics. National income statistics are taken from the IMF World Economic Outlook.

Note[1]: The hypothesis of 'non-stationarity' is rejected if the ADF result for twice differentiated variables is greater than critical value which indicates that the examined series are second order stationary [I(2)].

Table 4. Results of Granger Causality Test

Country (Period)	Hypothesis	Result of Granger Test	P Value[1]	Direction of Causality
Turkey (1980–2005)	TX does not Granger cause TY.	3,9154	0,0376*	TX → TY
	TY does not Granger cause TX.	0,3122	0,7354	
	TM does not Granger cause TY.	1,4198	0,2662	No causality
	TY does not Granger cause TM.	0,2512	0,8703	
	TM does not Granger cause TX.	0,1183	0,8890	TX → TM
	TX does not Granger cause TM.	6,7883	0,0059**	
Czech Republic (1992–2005)	CzX does not Granger cause CzY.	4,8446	0,0467	CzX → CzY
	CzY does not Granger cause CzX.	0,0641	0,9384	
	CzM does not Granger cause CzY.	0,7247	0,5175	No causality
	CzY does not Granger cause CzM.	0,7996	0,4866	
	CzM does not Granger cause CzX.	2,3029	0,1704	CzX → CzM
	CzX does not Granger cause CzM.	5,7783	0,0329*	
Hungary (1992–2005)	HX does not Granger cause HY.	12,2956	0,0051**	HX → HY
	HY does not Granger cause HX.	3,7203	0,0793	
	HM does not Granger cause HY.	1,9542	0,2116	No causality
	HY does not Granger cause HM.	0,8699	0,4598	
	HM does not Granger cause HX.	0,1278	0,8819	HX → HM
	HX does not Granger cause HM.	0,4251	0,4694*	
Poland (1992–2005)	PX does not Granger cause PY.	13,3070	0,0041**	PX → PY
	PY does not Granger cause PX.	1,7925	0,2351	
	PM does not Granger cause PY.	5,7359	0,0335*	PM → PY
	PY does not Granger cause PM.	1,7041	0,2494	
	PM does not Granger cause PX.	4,9956	0,0495*	PX → PM
	PX does not Granger cause PM.	3,1990	0,1030	
Argentina (1980–2004)	AX does not Granger cause AY.	0,0259	0,9744	No causality
	AY does not Granger cause AX.	1,6226	0,2249	
	AM does not Granger cause AY.	0,9239	0,4149	No causality
	AY does not Granger cause AM.	0,7167	0,5017	
	AM does not Granger cause AX.	0,1456	0,8654	AX → AM
	AX does not Granger cause AM.	3,9987	0,0365*	
Brazil (1980–2004)	BX does not Granger cause BY.	3,0759	0,0709	No causality
	BY does not Granger cause BX.	1,0070	0,3849	
	BM does not Granger cause BY.	1,1579	0,3364	No causality
	BY does not Granger cause BM.	0,6672	0,5253	
	BM does not Granger cause BX.	0,4603	0,6382	BX → BM
	BX does not Granger cause BM.	5,9762	0,0102*	
India (1980–2004)	IX does not Granger cause IY.	1,6345	0,4416*	IX → IY
	IY does not Granger cause IX.	0,5665	0,5772	
	IM does not Granger cause IY.	11,9632	0,0005**	IM → IY
	IY does not Granger cause IM.	1,9108	0,1768	
	IM does not Granger cause IX.	4,2498	0,0457*	IM → IX
	IX does not Granger cause IM.	0,7218	0,4993	
China (1984–2005)	CX does not Granger cause CY.	8,7719	0,0033**	CX → CY
	CY does not Granger cause CX.	0,7277	0,5004	
	CM does not Granger cause CY.	4,3811	0,0433*	CM → CY
	CY does not Granger cause CM.	0,7092	0,5088	
	CM does not Granger cause CX.	4,4005	0,0329*	CM → CX
	CX does not Granger cause CM.	0,6708	0,5269	

Note[1]: The hypothesis is rejected if probability (P) value is less than 0.05 or 0,01 at 5 or 1 percent significance levels respectively.

** Significant at 5 percent. ** Significant at 1 percent.*

was tested relating to export, import and national income variables for each country, are given in Table 4[9] .

The following evaluations can be made for each country on the causality between foreign trade and national income and direction of causality[10]:

a. It is seen that, there is a causality relation running from the exports to the national income for all countries except Argentina and Brazil. Consequently, the export-led growth hypothesis is supported for a significant part of the countries examined.

b. A causality relation between imports and national income exists only in cases of Poland, India and China.

c. In example of Turkey, we do not find any causality relation between imports and national income; however, our results suggest a strong relation running from exports to imports. Consequently, the increases in exports appear to promote imports significantly.

d. Poland, which has adopted an outward-oriented and market economy-led growth strategy after the 1990s, shows a different structure compared with the Czech Republic and Hungary. While we do not find any causality relation between imports and national income for the other two countries, foreign trade appears to have an important effect on national income through both exports and imports in Poland.

e. The relation between foreign trade and national income for India and China, which obtained a rapid growth performance in recent years, shows a similar structure. That there is a causality relation running from imports to exports indicates that the increases in the imports promote exports in these countries. It appears that the factors such as, domestic demand pressure, insufficiency of investment and intermediate goods increase the imports in these largely populated countries, which are poor in natural resources and quite dependent on foreign trade. In addition, increasing foreign direct investment (FDI), may very well force these two countries to use more imported materials. These arguments suggest that imports of India and China may increase independently of foreign demand and therefore exports do not necessarily affect imports.

6. Conclusion

The main aim of the study is to test the validity of export-led growth hypothesis by using Granger causality analysis. Beside Turkey, we also examine the newly developing economies such as the Czech Republic, Hungary, Poland, Argentina, Brazil, India and China. We consider the post-1980 period as the export-led growth strategies have spread rapidly during this period.

First, we explore the trend of exports and national income growth of Turkey in six sub-periods after the1980s. This analysis reveals the fact that, although some fluctuations were experienced in certain periods after implementation of free trade regime, Turkey's exports between 1980 and 2005 have increased from 2.9 billion dollars to 73 billion dollars by an increase of approximately 25-fold in 25 years.

Our analysis on Turkey's national income indicates that Turkey has showed an outstanding growth performance, excluding crisis periods. The national income, which was approximately 68 billion dollars in 1980, exceeded 360 billion dollars in 2005 by an increase of more than 5-fold. In the total period, average national income was 149.1 billion dollars and average growth rate was 4.1 percent. When the crisis periods are excluded, annual average growth rate increases up to 6 percent. Therefore, it appears that economic crisis undermined Turkey's long-term development process and sustainable growth seriously.

Finally, our empirical results on the relation between exports and growth provide strong support for the export-led growth hypothesis. According to our findings, there is a unidirectional relationship running from exports to growth for all the countries, except Argentina and Brazil. However, we find causality relation between imports and growth only in the cases of Poland, India and China.

The analysis on Turkey also indicates a strong causality relation running from exports to imports. This finding suggests that the increases in exports promote imports significantly in Turkey. This result is particularly useful in explaining why trade deficit still remains as a serious problem despite the recent serious increases in the exports. Our finding of the strong unidirectional relation between exports and imports suggests that increases in Turkey's exports result in parallel increases in imports due to the robust dependency of Turkish manufacture sector on imported intermediate goods.

[9] Standard Granger causality test is used to determine the existence and the direction of a causal relation between two variables and it is the most preferred method because it is applied easily. Co-integration technique developed by Granger (1986) and Engle and Granger (1987) contributed to review theoretic studies relating to causality test. According to this new approach, if two variables (for example X and Y) can make co-integration, there is an Error Correction Mechanism-ECM), which removes imbalances in short term. As a result of ECM, the delayed error term, which is also a function of $Yt\text{-}1$ and $Xt\text{-}1$, should cause ΔYt or ΔXt or both. Granger (1988) expressed that there would be a causality relation, even if it is one-direction, between co-integrated variables.

[10] For the other studies intended for testing export-led growth hypothesis for Turkey, see Bahmani-Oskooee and Domac (1995), Yigidim and Kose (1997), Ozmen and Furtun (1998) and Simsek (2003). These studies cover different periods and use quite different methods. Among these works, only Bahmani-Oskooee and Domac's study, which was done for the period of 1923–1990, found a bi-directional causality relation between Turkey's exports and national income.

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EKSPORTO NULEMTO AUGIMO HIPOTEZĖS TIKRINIMAS: TURKIJOS IR KITŲ BESIVYSTANČIŲ ŠALIŲ LYGINAMOJI ANALIZĖ

Levent Kosekahyaoglu

Santrauka

Ryšio tarp eksporto ir šalies nacionalinių pajamų pobūdis jau ilgą laiką yra diskutuojamas tiek užsienio prekybos, tiek augimo teorijų kontekste. Šis klausimas ypač aktualus pagrindžiant argumentus už „laisvą prekybą“ arba, priešingai, remiant „protekcionizmą“ (importo pakaitalą), kadangi priežastinio ryšio tarp eksporto ir pajamų egzistavimas reikštų laisvos prekybos rėmimo politikos didesnį efektyvumą. Norint patikrinti eksporto nulemto augimo hipotezės teisingumą, šiame darbe, taikant Granger priežastingumo analizės būdą, siekiama nustatyti ryšio pobūdį tarp prekybos (eksporto ir importo) bei pajamų Turkijoje ir kitose besivystančiose šalyse. Gauti rezultatai liudija, kad eksporto nulemto augimo hipotezė nepasitvirtina tik Argentinoje ir Brazilijoje, o Turkijoje, Čekijoje, Vengrijoje, Lenkijoje ir Kinijoje nustatytas stiprus netiesioginis priežastinis ryšys tarp eksporto ir ekonominio augimo.

Reikšminiai žodžiai: eksporto nulemtas augimas, importo pakaitalas, Granger priežastingumo analizė.

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