BALANCE OF PAYMENTS CONSTRAINED GROWTH IN TURKEY (1950-2014)

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Abstract

This paper investigates whether Thirlwall's law, or balance of payments-constrained growth model (BPC) holds for Turkey, using annual data spanning from 1950 to 2014. Unlike previous studies for the country, we tested both original Thirlwall's law and its modified version with capital flows and interest payments, for a much longer period. The empirical findings indicate that Thirlwall's law somewhat holds for Turkey and further restrictions imposed by modified version of the Thirlwall's law do not constitute an important hindrance to economic growth performance directly. Turkey should improve its production base and manage to produce higher quality products for both exports and domestic consumption. Such a policy will solve balance of payments constrained growth problem, by both increasing exports and decreasing income elasticity of demand for imports.

Key Words: balance-of-payments constrained, Thirlwall's law, economic growth, Turkey, cointegration.

JEL Classification: F10, F32, F43.

ÖDEMELER DENGESİ KISITLI BÜYÜME: TÜRKİYE ÖRNEĞİ (1950-2014)

Özet

Bu makalede 1950-2014 dönemine ait yıllık veriler yardımıyla Thirlwall kanununun (ödemeler dengesi kısıtlı büyüme) Türkiye için geçerli olup olmadığı incelenmektedir. Türkiye için yapılan daha önceki çalışmaların aksine, bu çalışmada hem orjinal Thirlwall kanunu ve hem de bu kanunun sermaye hareketleri ve faiz ödemeleriyle modifiye edilmiş versiyonu çok daha uzun bir periyot için test edilmiştir. Ampirik bulgular Thirlwall kanununun Türkiye için kısmen geçerli olduğunu ve Thirlwall kanununun modifiye versiyonunun ekonomik büyüme performansı üzerinde direkt olarak önemli bir engel oluşturmadığını göstermektedir. Türkiye üretim altyapısını geliştirmeli ve hem ihracat hem de iç tüketim için yüksek kalite üretim yapmalıdır. Bu şekilde bir politika hem ihracatı arttırarak hem de ithalat talebinin gelir esnekliğini düşürerek ödemeler dengesi kısıtlı büyüme problemini çözecektir.

Anahtar Kelimeler: ödemeler dengesi kısıtı, Thirlwall kanunu, ekonomik büyüme, Türkiye, koentegrasyon.

JEL Sınıflandırması: F10, F32, F43.

INTRODUCTION

Whether economic growth is supply-constrained or demand-constrained is a hotly debated topic in the economic literature. While neoclassical economics emphasizes supply-related factors such as technological progress and productivity rises as the main contributors to the growth, Keynesian economics highlights effective demand, which has a significant influence on the growth trajectories of the countries in the long run. Moreover, as most of the industrialized and also some emerging countries have been struggling to increase their demand levels in the wake of the 2008 global financial crisis, Keynesian demand-side approach to the economic growth subject seems all the more relevant.

Within Keynesian tradition, balance-of-payments-constrained (BPC) growth model has supplied important insights into the nature of the demand-constrained growth. BPC model and so-called Thirlwall law has been put forth by Thirlwall (1979) in a seminal paper some four decades ago. BPC model suggests that economic growth is balance-of-payments-constrained and in the long run, economic growth, under certain conditions such as no price or exchange rate effects, is highly dependent on growth in exports and income elasticity for imports. Although, the model has been modified several times, the fundamental insight acquired from the original model did not change and Thirlwall law proved to be a useful approach in explaining growth trajectories of the countries.

Since its inception, numerous empirical studies tested BPC model for different countries and periods, and these studies mostly lent support for the model. While in the beginning these studies were implemented by using traditional econometric techniques, namely ordinary-least-squares (OLS) and/or two-staged-least-squares (2SLS), cointegration techniques started to be used starting from 1990s and particularly from 2000s on. The empirical studies include Bairam (1988) for 19 countries from Western Europe and North America; Atesoglu (1993, 1994a, 1997) for United States, Bairam (1993) for five Western European countries; Alonso (1999) for Spain; López and Cruz (2000) and Holland, Vieira, and Canuto (2004) for Latin America; Bairam and Ng (2001) for New Zealand, UK and Canada; Halicioglu (2012) for Turkey; Bértola, Higachi, and Porcile (2002) and Britto and McCombie (2009) for Brazil; Razmi (2005) for India; Bagnai (2010) for 22 OECD countries; Jeon (2009) for China and Chena (2014) for Argentina.

In this study, we aim to empirically contribute to and extend this fruitful literature by using cointegration technique for a relatively long period (1950-2014), which covers import-substitution period (1950-1980), neoliberal export-oriented period (1980-2014) and also high-current-account-deficit period (2003-2014), for Turkey, unlike previous empirical studies for this country.

In the next section, we revisit the theoretical foundations of the original BPC model and its modified versions. In the third section, we employ econometric analysis. Finally, the fourth section concludes.

1. THEORETICAL FRAMEWORK

Balance-of-Payments-Constrained growth model (BPC), which is a dynamic version of the static trade multiplier model of Harrod (1933), was formulated in a seminal article by Thirlwall (1979). Original BPC model is based on three equations: Equation 1 is the traditional export demand function and Equation 2 is the traditional import demand function. Lastly, Equation 3 represents balance of payments equilibrium condition.

$$x_t = \eta(p_{dt} - p_{ft} - e_t) + \mathcal{E}(z_t) \qquad (1)$$

$$m_t = Y(p_{ft} - p_{dt} + e_t) + \pi(y_t) \qquad (2)$$

$$p_{dt} + x_t = p_{ft} + m_t + e_t \qquad (3)$$

where x denotes the growth rate of exports, m represents growth rate of imports, p_d and p_f denotes the rate of the change in domestic prices of exports and foreign prices of imports, respectively. While, e represents the rate of change in the nominal exchange rate, $\mathcal{E} > 0$ represents world income elasticity of demand for exports and z represents the growth rate of world income. Similarly, $\pi > 0$ denotes domestic income elasticity of demand for imports and y denotes the growth rate of domestic income. Lastly, $\eta < 0$ represents price elasticity of demand for exports and $Y < 0$ represents price elasticity of demand for imports. Note that own price elasticity of demand for exports and cross elasticity of demand for exports are assumed to be equal in Equation 1. Likewise, own price elasticity of demand for imports and cross elasticity of demand for imports are assumed to be equal in Equation 2.

Substituting Equation 1 and 2 into Equation 3 and ordering gives Equation 4, which is balance-of-payments-constrained growth rate:

$$y_t = \frac{(1 + \eta + Y)(p_{dt} - p_{ft} - e_t) + \mathcal{E}(z_t)}{\pi} \qquad (4)$$

If the Marshall-Lerner condition holds ($\eta + Y = -1$) and/or relative prices do not change in the long run, Equation 4 boils down to Equation 5, which is the BPC equation of Thirlwall:

$$y_t = \frac{\mathcal{E}(z_t)}{\pi}, \text{ or } y_t = \frac{x_t}{\pi} \qquad (5)$$

The original BPC model was modified several times. First, Thirlwall and Hussain (1982) extended the original model by allowing for capital flows. They stated that while capital flows are relatively unimportant when it comes to contributing to the deviations in the growth rates, which are in compliance with the current account equilibrium in most industrialized countries, developing countries often face capital bottlenecks and they need and get capital inflows and this results in ever-growing current account deficits, which, in turn, renders these countries to grow faster than what is dictated by original BPC model.

Capital-flows extended version of original BPC model is stated in Equation 6:

$$\alpha(p_{dt} + x_t) + \beta(c_t) = p_{ft} + m_t + e_t \qquad (6)$$

where c denotes the domestic-currency value of foreign capital inflows, α represents the share of capital obtained by exports and β represents the share of capital obtained by foreign capital inflows. Thus, α + β = 1.

Substituting Equations 1 and 2 into Equation 6 and ordering gives Equation 7, which is capital-flows-modified balance-of-payments-constrained growth rate:

$$y_t = \frac{(1+\alpha\eta+\gamma)(p_{dt}-p_{ft}-e_t)+\alpha\varepsilon(z_t)+\beta(c_t-p_{dt})}{\pi} \qquad (7)$$

If relative prices do not change in the long run, Equation 7 contracts to Equation 8:

$$y_t = \frac{\alpha\varepsilon(z_t)+\beta(c_t-p_{dt})}{\pi}, \text{ or } y_t = \frac{\alpha x_t+\beta(c_t-p_{dt})}{\pi} \qquad (8)$$

Equation 8 represents the extended version with capital flows of original Thirlwall's law. In this version, balance-of-payments-constrained growth rate is now dependent on both the growth of exports level and the growth of capital inflows.

On the other hand, if relative prices do not change in the long run and the rate of growth of capital inflows is zero, Equation 7 contracts to Equation 9:

$$y_t = \frac{\alpha\varepsilon(z_t)-\beta(p_{dt})}{\pi}, \text{ or } y_t = \frac{\alpha x_t-\beta(p_{dt})}{\pi} \qquad (9)$$

Equation 9 shows the situation where there is current account disequilibrium in the first place and capital inflows are stable. The growth rate implied by Equation 8 is certainly low than the growth rate implied by Equation 5, since when imports are higher than exports, an equal rate of increase in both exports and imports would surely widen the gap between these, and when there is no corresponding increase in capital inflows, the growth of income would be reduced in order to reach original gap which is financed by original capital inflows. Hence, in this situation, capital inflows also dictate an equilibrium economic growth rate, which is determined by also (the growth rate of) capital flows.

Overall, the modified BPC model added another element, which is capital (in)flows, in explaining economic growth rates. However, the modified version of BPC had nothing to say about the foreign debt accumulation and ignored problems associated with it as Moreno-Brid (1998) put it succinctly:

"although it [modified BPC model] allowed for nonzero foreign capital inflows, it imposed no restriction whatsoever on their trajectory except for the balance-of-payments accounting principle, which forces the total debit and credit items to cancel out." [p. 283-4].

This theoretical gap in the modified version of the BPC model led others to modify further the original BPC model (e.g., Barbosa-Filho, 2001; McCombie & Thirlwall, 1997; Moreno-Brid, 1998; Moreno-Brid, 2003).

McCombie and Thirlwall (1997) imposed a debt restriction in the model. That is, a country with a relatively high debt to GDP ratio cannot obtain further capital from the financial markets, so cannot

increase debt to GDP ratio further. Hence they assumed that the growth of capital (in)flows matches exactly growth of income. So, modified BPC model becomes:

$$y_t = \frac{\theta(x_t)}{\pi - (1-\theta)} \qquad (10)$$

where, θ stands for the share of export incomes in the overall foreign capital (export incomes + foreign debt) obtained by the country in the Equation 10. If θ equals to 1, then original Thirlwall law is obtained. However, the restriction of the debt to GDP ratio in this modified model has little importance. For example, let say, the exports account for 25 percent of the total GDP in a relatively open economy. Suppose the economy persistently runs a relatively high current account deficit of 5 percent. Given π is 1.8, θ becomes 0,83 and $y = [\frac{\theta}{[\pi-(1-\theta)]}]x$ equals 0,51x. If there were no restriction, $y = x/\pi$ would equal to 0,56x. If the economy ran a more realistic current account deficit of, let say, 3 percent, instead of 5 percent, ceteris paribus, θ would be 0,89 and $y = [\frac{\theta}{[\pi-(1-\theta)]}]x$ would be 0,53x and $y = x/\pi$ would be 0,56x. Hence, the modified version of Thirlwall's law gives a close approximation the original and more simplistic Thirlwall's law.

Moreno-Brid (1998) also modified the original BPC model similarly "by forcing foreign capital inflows to move in long-run tandem with domestic income" (p. 288). Barbosa-Filho (2001) criticized this modified BPC on grounds that, firstly the implied balance-of-payments-constrained growth rate of the modified model is not necessarily stable and secondly, the modified model does not make a distinction between interest payments and imports of goods and non-factor services. So, Barbosa-Filho (2001) extended the modified model theoretically:

"to allow for a 'sustainable' accumulation of foreign debt taking into consideration both the potential instability of such a constraint and the impact of interest payments on debt accumulation." [p. 382].

Similarly, Moreno-Brid (2003) extended the modified BPC by taking into account net interest payments in order to capture their effect on the long-run rate of economic growth. So, modified BPC model takes the following form, when terms of trade have no significant impact in the long-run:

$$y_t = \frac{\theta_1(x_t) - \theta_2(r_t)}{\pi - (1-\theta_1+\theta_2)} \qquad (11)$$

where, $\theta_1 > 0$ denotes the share of imports covered by revenues obtained by exports and θ_2 denotes the share of net interest payments abroad in the overall imports. Lastly, r_t represents the growth in the net interest payments abroad. In this setting, if current account deficit is zero, that is $(1-\theta_1+\theta_2=0)$, then BPC model becomes:

$$y_t = \frac{\theta_1(x_t) - \theta_2(r_t)}{\pi} \qquad (12)$$

where, $\theta_1+\theta_2 = 1$. Moreover, if interest payments abroad is stable, that is the growth rate is zero, that is $\theta_1 = 1$, then original Thirlwall's law is obtained:

$$y_t = \frac{x_t}{\pi} \qquad (5)$$

2. ECONOMETRIC ANALYSIS

In this section, the original and as well as modified BPC models are tested through using Johansen cointegration technique (Johansen, 1991, 1995) and vector error correction (VEC) model. These approaches give the opportunity to understand whether there is a long-run relationship between imports and real output and, to calculate the income elasticity for imports, which is a very important variable for testing the original and modified BPC models.

Import demand function, which was calculated in order to estimate the income elasticity for imports within the framework of Thirlwall's law, is as follows:

$$LM_t = \alpha + \pi LY_t + \varepsilon_t \qquad (13)$$

where LM denotes the logarithm of the real imports, LY represents logarithm of the real output (real income). Finally, ε denotes the error term. Note that there is no reliable terms of trade data prior 1980 for Turkey. For this reason and also relative prices do not have a significant effect on imports or real output in the long run both theoretically and in Thirlwall's law, we did not include terms of trade variable in the import demand function.

Annual data between 1950-2014 was used for the estimation. First, we should determine the order of integration for both of the series, since series with different integration orders cannot be cointegrated and are not viable for the use of the cointegration technique. In order to reveal the integration order of the series we carried out Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests for the variables (Dickey & Fuller, 1979, 1981; Phillips & Perron, 1988). As can be seen in the Table 1, both series have a unit root in their levels and are stationary in their first difference at 1 percent significance level for both Augmented Dickey-Fuller test and Phillips-Perron test. That means both series are of the same integration order, that is they are I(1) and we can securely test for cointegration and hence for a long-run relationship between these variables.

Table 1. Unit Root Tests

Variables	Augmented Dickey Fuller		Phillips Perron	
	t-stats	Critical Values	t-stats	Critical Values
LM	-0,36	-3,54	-0,38	-3,54
LY	-1,88	-3,54	-2,45	-3,54
ΔLM	-6,61*	-3,54	-6,54*	-3,54
ΔLY	-8,18*	-3,54	-8,5*	-3,54

Note: LM and LY are logarithm of real imports and logarithm of real output, respectively. Δ indicates first differences. Critical values are for 1 percent significance levels and asterisk indicates stationarity at 1 percent significance level. H_0: The series has a unit root.

Second, we should determine the appropriate lag length for the model. For this, we estimated an unconstrained vector autoregression (VAR) model and determined the lag length using different criteria. At this point while some criteria including Akaike information criteria suggest 1 lag-length, others including Schwarz information criteria recommend 2 lag-length. Since the data used in this study are annual data and that we will construct a VEC model, we opted for 2 lag-length and determined that the model has VAR(2) structure, which is equivalent to VEC(1).

Table 2. Lag Length Determination Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-41.67576	NA	0.017817	1.648142	1.722493	1.676734
1	133.4180	**330.3656***	2.80e-05	-4.808227	**-4.585175***	**-4.722452***
2	137.5899	7.556656	**2.78e-05***	**-4.814713***	-4.442960	-4.671755
3	140.1710	4.480432	2.94e-05	-4.761171	-4.240716	-4.561029
4	143.7730	5.980707	3.00e-05	-4.746153	-4.076997	-4.488828
5	145.6639	2.996881	3.26e-05	-4.666563	-3.848706	-4.352055
6	149.4646	5.736787	3.32e-05	-4.659040	-3.692481	-4.287348
7	152.5725	4.456738	3.47e-05	-4.625379	-3.510119	-4.196504
8	156.5544	5.409339	3.52e-05	-4.624695	-3.360734	-4.138637
9	157.3434	1.012286	4.06e-05	-4.503525	-3.090863	-3.960283
10	160.3696	3.654250	4.32e-05	-4.466777	-2.905413	-3.866352
11	164.3656	4.523851	4.45e-05	-4.466628	-2.756564	-3.809020
12	165.3388	1.028211	5.19e-05	-4.352407	-2.493641	-3.637615

Note: LogL is logarithmic likelihood, LR is sequential modified LR test statistic (each test at 5% level), FPE is final prediction error, AIC is Akaike information criteria, SC is Schwarz information criteria, and HQ is Hannan-Quinn criteria. Lag lengths suggested are those which are shown bold and with asterisks.

Table 3. Johansen Cointegration Test

	Trace		
	Trace Statistic	0.05 Critical Value	Probability
First Hypothesis	20,8	15,5	0,0072
Second Hypothesis	1,11	3,84	0,2932

	Maximum Eigenvalue		
	Trace Statistic	0.05 Critical Value	Probability
First Hypothesis	19,7	14,3	0,0063
Second Hypothesis	1,11	3,84	0,2932

Note: First hypothesis: H_0: r = 0, H_1: r ≥ 1, second hypothesis: H_0: r ≤ 1, H_1: r ≥ 2. r denotes the number of the cointegrating equations. Both Trace and Maximum Eigenvalue tests indicate one cointegrating equation at the 5 percent significance level.

Table 4. Vector Error Correction Model (VECM)

	Constant	LM	LY		ΔLM	ΔLY
Cointegrating Equation	20,03	1	-2,07	Error Correction	-0,31876	0,02710
Standard Error			0,07859	Standard Errors	0,08707	0,01833
t-statistic			-26,3452	t-statistics	-3,66114	1,47825

Note: LM and LY are logarithm of real imports and logarithm of real output, respectively. Δ indicates first differences.

Third, we implemented Johansen cointegration technique and constructed a VEC model. As can be seen in the Table 3, both tests indicate that there is one cointegrating equation, that is the series spanning from 1950-2014 of real import and real output (real income) are cointegrated at the 5 percent significance level. The estimated cointegrating equation is as follows:

$$LM_t = 20.04 + 2.07 LY_t \tag{14}$$

As can be seen in the Equation 14, the estimated coefficient for income elasticity for demand is statistically significant and 2.07, which is very plausible given the previous income elasticity for import demand estimations.

After having estimated the import demand function, we tested whether estimated income elasticity of demand for imports was statistically not different from actual (average) income elasticity of demand for imports. In order to do this, first, we solved the original BPC model, which is given in Equation 5, yielding Equation 15:

$$\pi_{org} = \frac{x_{avg}}{y_{avg}} \tag{15}$$

where, x_{avg} denotes average growth rate of exports and y_{avg} denotes average economic growth rate for specific periods, π_{org} represents income elasticity of demand for imports after original BPC model.

Second, in order to capture the influences of foreign investments and interest payments, we adopted the modified model suggested by Moreno-Brid (2003), and solved Equation 11, yielding Equation 16:

$$\pi_{mod} = (1 - \theta_1 + \theta_2) + \frac{\theta_1(x_{avg}) - \theta_2(r_{avg})}{y_{avg}} \tag{16}$$

where, π_{mod} denotes income elasticity of demand for imports after modified BPC model, r_{avg} denotes average net interest payments-to-imports ratio for specific periods.

For the modified BPC model, we need exports-to-imports ratio and net interest payments-to-imports ratio variables. The evolution of these variables can be seen in Figure 1. What is very clear in the figure is that exports-to-imports ratio throughout the period is below 1.00, except the years in which Turkish economy endured financial crises (1988, 1994, 2001). The average for this ratio throughout the period is 0.78, which is extremely low. The average ratio is further lower (0.66) in the import substitution period (1950-1979) than in the neoliberal export-led growth (0.88) period (1980-

2014). On the other hand, net interest payments-to-imports ratio increased steadily as exports-to-imports ratio was in a declining trend from 1950s through 1970s, reaching its apex (0.19) in 1979 as the country hit hard by the two-petroleum crisis and rising inflation rates. From then on, this ratio declined steadily well into the 2000s, eventually leveling out some 0.04 on average for the last 8 years (2007-2014), due to multiple reasons, including much easier access to international capital in the latter period, and much lower inflation rates, not to mention much more stable political climate, particularly in the 2000s.

Figure 1. The Ratios of Exports-to-Imports and Net Interest Payments-to-Imports
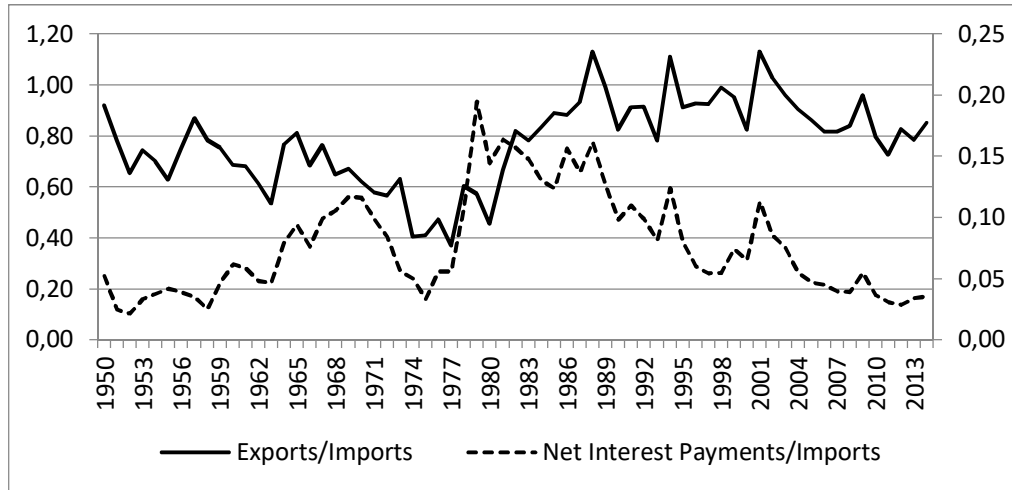
Note: All the data were taken from Turkish Statistical Institute. The left vertical scale is for exports to imports ratio and the right vertical scale is for net interest payments to imports ratio.

As can be seen in the Table 5, average income elasticity of demand for imports (2.13) for the original BPC model is very close to the computed income elasticity of demand for imports (2.07). This may mean a confirmation of the original Thirlwall's law and Turkish growth rate actually could be balance of payments-constrained. However, average elasticity for the modified BPC model (1.74) is somewhat lower from the computed one. This may be due to that external financing does not constitute a hindrance to economic growth in Turkey. This makes sense, since Turkey kept running current account deficits in excess of five percent for more than a decade as of 2016, and external financing, far from drying off, actually keep coming increasingly.

After having confirmed Thirlwall's law tentatively in Turkey, we tested the original and modified BPC model by calculating three- and five-year moving average of actual GDP growth rates and hypothetical GDP growth rates predicted by original and modified BPC models. This approach was adopted by Atesoglu (1993, 1994b). Figure 2 and 3 show the actual and hypothetical GDP growth rates from 1951 to 2014.

Table 5. Average Elasticities for Original and Modified BPC Model

Average growth rates for the 1950-2014 period			
GDP	Exports	Imports	Net Interest Payments
4,9	10,4	11,0	13,3

Exports-to-Imports & Net interest payments-to-imports ratios	
θ_1	θ_2
0,78	0,08

Average income elasticities of demand for imports	
π_{org}	π_{mod}
2,13	1,74

Note: π_{org} and π_{mod} are average elasticities for original and modified BPC model, respectively.

Two important points emerge in the Figure 2 and 3. First, prior to 1980s, Turkey was implementing import-substitution policy and its foreign trade volume was rather feeble. Because of this, actual GDP growth rate is higher than the hypothetical growth rates predicted by original and modified BPC models in most of the years prior to 1980s. Turkey abandoned this economic policy and switched to export-oriented growth strategy in the 1980s.

Figure 2. Three-Year Moving Averages of Actual and Hypothetical GDP Growth Rates
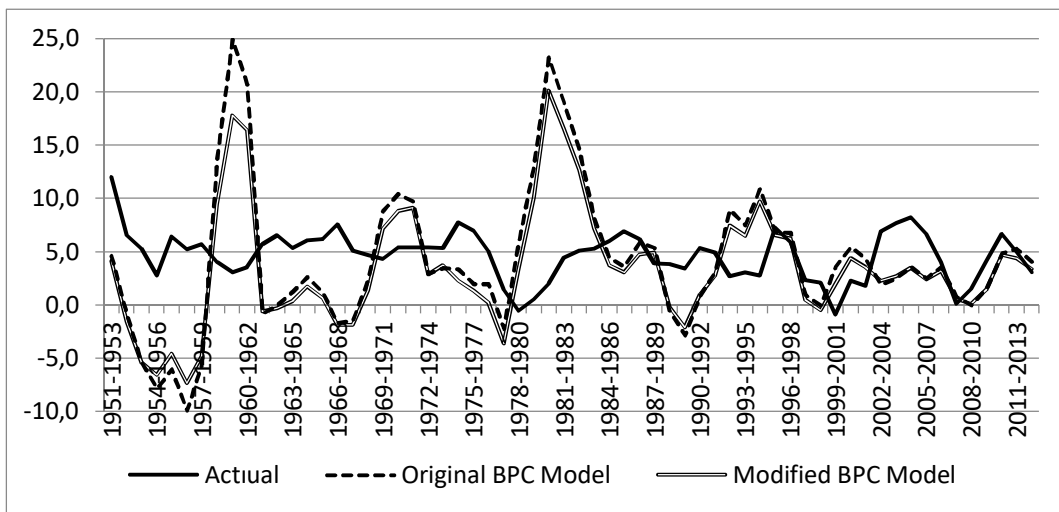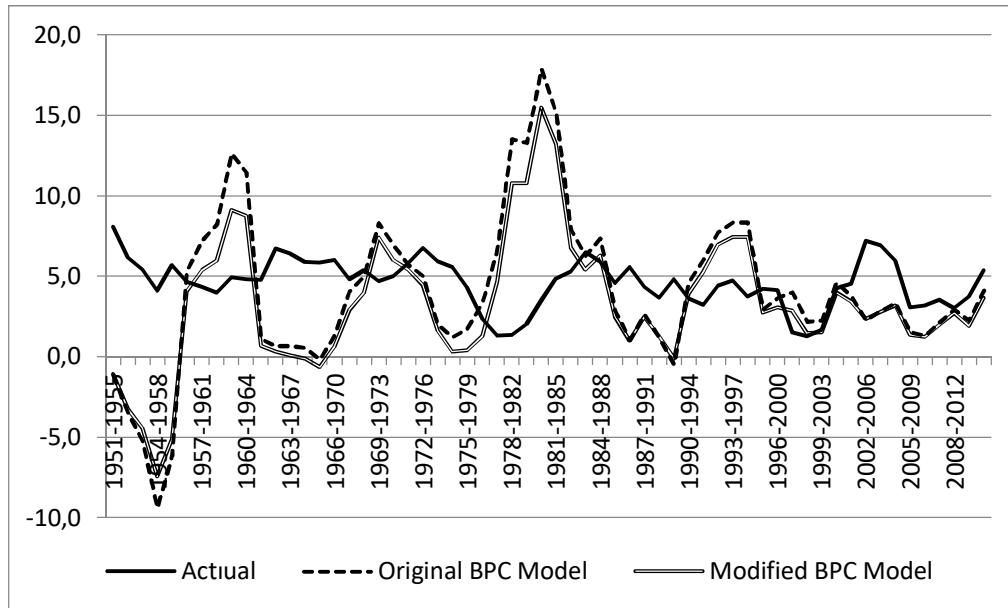

Note: The graph represents three-year smoothed series of; actual GDP growth rate, and hypothetical GDP growth rates predicted by original BPC model (calculated by ordering of Equation 15) and by modified BPC model (calculated by ordering of Equation 16).

As a direct result of that, Turkish exports and imports rose dramatically in the 1980s. In the first half of the 1980s, exports increased by an average of some 38 percent per annum. Hence, contrary to the earlier period, actual growth rates dramatically fell behind those rates predicted by BPC models in the 1980s. However, as the growth rates of exports and imports lost the initial momentum stemming

from the policy switch boost, actual growth rates and those predicted by the models started to converge in the 1990s.

Figure 3. Five-Year Moving Averages of Actual and Hypothetical GDP Growth Rates

Note: The graph represents five-year smoothed series of; actual GDP growth rate, and hypothetical GDP growth rates predicted by original BPC model (calculated by ordering of Equation 15) and by modified BPC model (calculated by ordering of Equation 16).

Second, predicted growth rates overestimate actual growth rates in the 1990s and underestimate them in the 2000s. This situation reflects political instability and economic turmoil in Turkey in the 1990s, in which the growth rates were rather disappointing. On the other hand, as Turkey regained its political stability in the 2000s and global liquidity expanded further and further in this period, Turkey could be able to run larger and larger current account deficits, ending up current account deficit in excess of five percent of GDP per annum on average in this period. Hence the underestimation of the actual growth rates.

This test also lends support balance of payments constrained growth theory, albeit in some periods the original and as well as modified BPC model underestimate or overestimate actual growth rates. However, historical contingencies and economic policies are also important in understanding growth trajectories of the countries, as Turkish case clearly shows. Moreover, even if predicted growth rates overestimate or underestimate actual growth rates, predicted growth rates tend to converge actual growth rates in the long run, as is clear in the Figure 2 and 3, which constitutes a further support to the Thirlwall's law.

CONCLUSION

This paper tested whether Thirlwall's law, or balance of payments-constrained growth model (BPC) holds for Turkey, using annual data spanning from 1950 to 2014. Unlike previous studies for the country, we tested both original Thirlwall's law and its modified version with capital flows and interest payments, for a much longer period. The empirical findings indicate that Thirlwall's law somewhat holds for Turkey and further restrictions imposed by modified version of the Thirlwall's law do not constitute an important hindrance to economic growth performance directly.

On the other hand, historical contingencies and economic policies are also important in the short run. For example, Turkey could be able to run very high current account deficits in the 2000s because of the global liquidity abundance, and the economy managed to grow in excess of what the Thirlwall's law dictates. However, as the concerns mounted over whether Turkey could sustain such high deficits and what would happen if there were a capital flight from the country, economic growth rates faltered in recent years and started to converge to balance of payments constrained growth rate.

In order to have a stable economic growth path, Turkey should increase its exports and decrease the income elasticity of demand for imports, as Thirlwall's law dictates. However, easier said than done. Although Turkey has been well aware of the current account deficit problem and the need to increase its exports, it failed to eliminate or appease the problem. In order to achieve this economic policy, Turkey should improve its production base and manage to produce higher quality products for both exports and domestic consumption. Such a policy will solve balance of payments constrained growth problem, by both increasing exports and decreasing income elasticity of demand for imports.

REFERENCES

Alonso, J. A. (1999). Growth and the external constraint: lessons from the Spanish case. *Applied Economics, 31*(2), 245-253.

Atesoglu, H. S. (1993). Balance-of-payments-constrained growth: Evidence from the United States. *Journal of Post Keynesian Economics*, 507-514.

Atesoglu, H. S. (1994a). An application of a Kaldorian export-led model of growth to the United States. *Applied Economics, 26*(5), 479-483.

Atesoglu, H. S. (1994b). Exports, capital flows, relative prices, and economic growth in Canada. *Journal of Post Keynesian Economics*, 289-297.

Atesoglu, H. S. (1997). Balance-of-payments-constrained growth model and its implications for the United States. *Journal of Post Keynesian Economics*, 327-335.

Bagnai, A. (2010). Structural changes, cointegration and the empirics of Thirlwall's law. *Applied Economics, 42*(10), 1315-1329.

Bairam, E. (1988). Balance of payments, the Harrod foreign trade multiplier and economic growth: the European and North American experience, 1970–85. *Applied Economics, 20*(12), 1635-1642.

Bairam, E. (1993). Static versus dynamic specifications and the Harrod foreign trade multiplier. *Applied Economics, 25*(6), 739-742.

Bairam, E., & Ng, L. (2001). Thirlwall's law and the stability of export and import income elasticities. *International Review of Applied Economics, 15*(3), 287-303.

Barbosa-Filho, N. H. (2001). The balance-of-payments constraint: from balanced trade to sustainable debt. *BNL Quarterly Review, 54*(219).

Bértola, L., Higachi, H., & Porcile, G. (2002). Balance-of-payments-constrained growth in Brazil: a test of Thirlwall's Law, 1890-1973. *Journal of Post Keynesian Economics, 25*(1), 123-140.

Britto, G., & McCombie, J. S. (2009). Thirlwall's law and the long-term equilibrium growth rate: an application to Brazil. *Journal of Post Keynesian Economics, 32*(1), 115-136.

Chena, P. I. (2014). Balance-of-payments-constrained growth in Argentina (1976-2006). *Journal of Post Keynesian Economics, 36*(4), 699-718.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American statistical association, 74*(366a), 427-431.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica: Journal of the Econometric Society*, 1057-1072.

Halicioglu, F. (2012). Balance-of-payments-constrained growth: the case of Turkey. *Journal of Post Keynesian Economics, 35*(1), 65-78.

Harrod, R. (1933). *International Economics*. Cambridge: Cambridge University Press.

Holland, M., Vieira, F. V., & Canuto, O. (2004). Economic growth and the balance-of-payments constraint in Latin America. *Investigación económica*, 45-74.

Jeon, Y. (2009). Balance-of-payment constrained growth: the case of China, 1979–2002. *International Review of Applied Economics, 23*(2), 135-146.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica: Journal of the Econometric Society*, 1551-1580.

Johansen, S. (1995). *Likelihood-based inference in cointegrated vector autoregressive models*. Oxford: Oxford University Press.

López, J., & Cruz, A. (2000). " Thirlwall's law" and beyond: the Latin American experience. *Journal of Post Keynesian Economics*, 477-495.

McCombie, J. S., & Thirlwall, A. P. (Eds.). (1997). *Economic growth and the balance of payments constraint revisited* (Vol. 2).

Moreno-Brid, J. C. (1998). On capital flows and the balance-of-payments-constrained growth model. *Journal of Post Keynesian Economics*, 283-298.

Moreno-Brid, J. C. (2003). Capital Flows, Interest Payments and the Balance-of-Payments Constrained Growth Model: A Theoretical and Empirical Analysis. *Metroeconomica, 54*(2-3), 346-365.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*(2), 335-346.

Razmi, A. (2005). Balance-of-payments-constrained growth model: the case of India. *Journal of Post Keynesian Economics, 27*(4), 655-687.

Thirlwall, A. P. (1979). The balance of payments constraint as an explanation of the international growth rate differences. *PSL Quarterly Review, 32*(128).

Thirlwall, A. P., & Hussain, M. N. (1982). The balance of payments constraint, capital flows and growth rate differences between developing countries. *Oxford Economic Papers*, 498-510.