The balance-of-payments constraint and economic growth in a small island economy in isolation: A theoretical perspective

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Abstract: This paper theoretically examines the determinants and constraints of the economic growth process in North Cyprus economy. Special features of this economy such as the presence of economic embargo, the lack of sufficiently large domestic demand, monetary union with Turkey, are taken into consideration in the investigation. In this regard, a demand-driven economic growth model which is based upon the Thirlwall law literature, is developed by considering the demand factor as the source of economic growth. The mainstream model is extended by separating total demand into external and domestic demand. The model also considers the distinction between tradable and non-tradable output and expenditure. Results indicate that domestic demand expansion, particularly on non-tradable goods sector output, is crucial to generate growth. Removing economic embargo is necessary to have positive growth rates, but the policy maker must also reduce the import dependency level of the economy on the Turkish economy. The theoretical investigation also shows that under the economic embargo, the North Cyprus economy suffers from the stringency of financial constraints, and direct aids from Turkey and, most importantly, the presence of monetary union help providing economic resources which are required to generate positively high economic growth rates.

Key Words: Thirlwall law, economic embargo, economic growth, North Cyprus, monetary union.

JEL Classification: O11, 024, O54, P44.

I. INTRODUCTION

The balance of payment constraint is one of the detrimental factors of economic growth. This is particularly true for developing countries. This is mainly because the economies of these countries heavily depend on importation, and financing expenditure on imports requires foreign currencies, and the balance of payment stances of these countries are in turn expected to constitute a constraint on expenditure in this kind. This demand side explanation put special emphasis on the availability of foreign exchange in determining economic growth, and export earnings and capital inflows are both considered as the main sources of foreign currencies (see Filho, 2001 and 2002; McCombie and Roberts, 2002).

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Tony Thirlwall has been one of the leading persons pioneering to model this relationship between the balance of payment constraint and economic growth, and he has postulated that the rate of economic growth in the long term is equal to the growth rate of the volume of exports divided by the income elasticity of demand for imports (Thirlwall, 1979; Thirlwall and Hussain, 1982 and Thirlwall, 1995). This relationship has accordingly become well known as the Thirlwall law in the literature, and its validity has extensively been tested empirically for different countries.¹ One common feature of these empirical studies is that economic growth is assumed to be demand driven, and it is emphasised only on external demand as a source of growth. The existing literature largely ignores the role of domestic demand that might play in the economic growth process in some cases.

Various variants of the Thirlwall model has been developed to analyse the different features of the economic growth process in developed and developing countries, and the most of them is built upon the relationship between economic growth and the availability of foreign exchange obtained from different sources (see McCombie, 1997; Elliott and Rhodd, 1999; Christopoulos, 2003; Ranaweera, 2004 and Pattichis, 2004). In this respect both domestic productions for external demand and easy access to international capital markets have played an important role to explain the differences in economic growth performance between countries. However they have widely neglected to explain economic growth in case of an economy with either very limited or no access to external product and capital markets. Another neglected area of research in this regard is the role of a monetary union practice in economic growth under a balance-of-payment constraint. This is particularly important in a small and highly dependent economy where there exits limited access to international markets to obtain foreign currencies.

The North Cyprus economy appears to possess all these features and exhibits a good example to extend the results of traditional Thirlwall models. First of all, the North Cyprus economy is small island economy with very limited domestic market (Tisdell, 2012 and Read, 2012). Second, due to the political dispute between Turkish and Greek sides of the island, North Cyprus is highly isolated from the world economy and has very limited indirect access to international markets mostly via Turkey. Third, the large proportion of domestic economic activities is expectedly non-tradable in nature, and the foreign exchange generation capability of the economy from foreign trade is extremely limited. Forth, it is highly dependent on the Turkish economy for

¹ There has so far been extensive empirical literature on testing the Thirlwall law. Among others, some recent studies can be noted as follows. Ateşoğlu (1994) for Germany, Moreno-Brid and Pérez (1999) for Central America, Hussain (1999) for African and East Asian Economies, Moreno-Brid (1999) for Mexico, Perraton (2003) for a group of developing countries, Pacheco-López (2005) for Mexico, Álvarez-Ude and Gómez (2007) for Argentina.
trade and capital inflows. And finally there is a monetary union practice between North Cyprus and Turkey with the adaptation of Turkish lira as a national currency.

The aim of the paper is to extend the main results of the traditional Thirlwall models in order to see the role of domestic demand as the detrimental factor of economic growth under the balance-of-payment constraint. It is also important to examine the impact of being in a common currency area with Turkey and to see how and to what extent the adaptation of Turkish lira as the national currency eases the stringency of the balance-of-payment constraint. The investigation is also expected to shed important light on what economic conditions are required to have unified Cyprus in the future.

In what follows, the present paper accordingly consists of four sections. The second section presents a conceptual background about North Cyprus and her economic features together with the theoretical framework based upon these features of the North Cyprus economy. The third section presents the theoretical model and reports the main findings. And finally the fourth section is devoted to conclusions and the policy implications of the paper.

II. CONCEPTUAL BACKGROUND AND THEORETICAL FRAMEWORK

Cyprus is a small island in the East Mediterranean Sea, and is occupied by two nations, namely Greek Cypriots on the south and Turkish Cypriots on the north. After Turkey’s military intervention to the political unrest in 1974, a long standing political dispute began in the international political community. Despite the numerous attempts to settle down this dispute peacefully, the declaration of a sovereign state on the North of the island in 1983 inevitably deteriorated the relationship of the Turkish side with the Greek Cypriots and the international community. This self-stemmed independency effort has not been recognised by international community, except Turkey. Besides it has in return ended up with economic and political isolation of the Turkish Cypriots from the international community. However Turkey became the only state recognising North Cyprus as a sovereign state, and inevitably developed close political and economic relationships with it. Despite various international efforts of seeking a peaceful settlement of this political dispute, North Cyprus has remained in isolation, and continued to be economically vulnerable with the presence of very limited access to world markets.²

² The latest effort was made by Kofi Annan, the former the General Secretary of the United Nation, and unfortunately failed due to the refusal of the Annan Plan by the Greek Referendum.
Some observers find the income difference between two sides of the island as the main obstacle for a peaceful settlement of the dispute. In terms of per capita income, the North Cyprus economy possesses almost half of the income level of the Greek side in 2006 (Mehmet, 2004). This huge income differences consequently urges the government of the North Cyprus to implement appropriate economic policies for the purpose of eradicating this income gap. However North Cyprus does not have so many options in this regard and the overall growth effort of the country is constrained by the availability of financial resources; particularly in the case of North Cyprus, the presence of economic embargoes increases the stringency of this financial resource constraint. The absence of free international trade and no access to international capital markets leave no option rather than developing close economic relations with Turkey, and make her the only trade partner, from which the North Cyprus is able to obtain financial resources required for attaining high economic growth rates. This dispute in the island is well known, and has extensively been studied by researchers in political science. However some features of the North Cypriot economy also provide novel information on the economic requirement of a sovereign state under an economic embargo, and deserve particular attention (see Güncavdı, 2012).

The model is built upon Thirlwall (1979) and Thirlwall and Hussain (1982), and the various variants of the model are available in the literature (e.g. see McCombie and Thirlwall, 1994). The model is built upon the demand-led determination of income which is strictly bounded by the presence of a balance of payment constraint. The model in this paper is modified version of the Thirlwall - Hussain’s model, and includes some distinctive features of the North Cypriot economy. Accordingly we take into account of the following features of the economy:

1. Insufficient level of domestic demand allowing for no import substitution in the tradable goods sector,
2. The large extent of the non-tradable sectors which is extensively used as being almost the only significant income generating sector available in the economy,

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3 The unification under the Annan plan was expected to boost income in the Northern Cyprus (NC) by almost 12%; in 2015 for example income in the NC would be 100 per cent larger than in the absence of unification. However, in comparison with the Greek side of the economy, income per capita in the NC economy appears to be the 40% of its value in the South. Eichengreen et al., 2004 find that the same figure would have risen to 60% of its value in the South in 2020 and income disparity between two sides of the island would prevail even after unification (see Eichengreen et al., 2004, p. 42). Mehmet (2002) on the other hand indicates that this finding of Eichengreen et al. (2004) could be the reason for the wrong perception in the Greek side of the island regarding the UN efforts for unification. In this view Mehmet (2004) indicates three major reasons why the Annan Plan failed. First, both sides lack information on what federalism is and how it can be made to work. Second, the plan was deficient in terms of power-sharing, providing for the collection and allocation of indirect taxes. The third one is the wrong perception, particularly in the south that economic inequalities would require large and persistent subsidies to the Turkish side by the Greek Cypriot.
The presence of economic embargoes on the external sectors and difficulties with exports (i.e. insufficient external demand),

The monetary union with Turkey and being a member of a common currency area, which implies perfect capital mobility.

The high dependence of the economy on Turkey for exports and imports,

The presence of high saving gaps (mainly due to the lack of significantly developed external sector generating international liquidity and high expenditure pattern in order to maintain high income level per capita) and its finance through aid and free capital inflows from Turkey.

First of all, North Cyprus has to deal with economic problems of being small island economy with limited natural resources and a very small domestic market. In particular, the size of domestic market brings about a demand constraint which is significant for industrialising the economy. The lack of sufficiently high external demand due to embargoes also increases the stringency of this demand constraint, and initiates expansionary demand policies in non-tradable sectors rather than tradable good producing sector. Moreover North Cyprus intentionally encourages some non-tradable sectors such as tourism and higher education sectors in order to earn foreign exchange (Turkish Lira in this case). High domestic demand in non-tradable goods, which would be necessary to stimulate aggregate demand with the expectation of generating economic growth, is sustained expectedly through high transfer payments and high income policies in the economy. The high economic growth episodes in the North Cyprus economy can be considered as to be provided largely by substantial increases in non-tradable economic activities. Especially easy and sustainable access to TL resources in the forms of aid and income inflows from Turkey allows North Cyprus for financing her high domestic expenditure in non-tradable economic activities.

The economic growth policies that have been implemented in the North Cyprus economy accordingly appear to be based upon the demand side stimulus such as high income policies and high public spending. Considering the insufficient amount of domestic demand this demand generating measures can be thought to be reasonable in order to generate high growth rates particularly under the circumstances of non-binding financial constraints. This demand orientation of the economic growth programme of the country leave us no option other than designing an economic growth model which relies on the encouragements of the demand side of the economy. Such modelling approach also presumes that the demand-oriented economic growth is

4 The limited ability of generating foreign exchange earning the country have become more prone to earn foreign exchange from non-tradable economic activities such as tourism, higher education, public services and construction, and their shares in GDP has recently increased.
constrained by the availability of finance for expenditure. This presumption is indeed quite appropriate in this occasion. This is because despite high saving gaps as a result of high domestic expenditure, the North Cyprus economy is not able to raise sufficient amount of financial resources through international trade and/or domestic financial markets.

There exist economic embargoes, which restricts the ability of the economy to trade freely with the world. However the presence of Turkey as a country that does not recognise the imposition of these embargoes on the external demand allows the North Cyprus economy to trade only with Turkey. With this feature of the foreign trade structure of the economy, embargoes can be considered as not to be a strictly binding constraint. Besides, the presence of common currency union with Turkey eases the stringency of financial constraints on high growth generating expenditure.

The economic embargoes in North Cyprus appear to have been imposed asymmetrically in the sense that they are not imposed on imports as strictly as on exports. This can however be accounted for the presence of high currency account deficit of the economy with the need of substantial amount of foreign exchange revenue. Since this revenue is not able to be earned from exports, the country becomes extremely dependent on export earnings from Turkey and capital inflows mainly in the form of aid and foreign direct investment from Turkey. This dependency can also be regarded the reason behind the adaptation of Turkish Lira (TL) as the national currency. The implication of the use of common currency in the trade with Turkey is that the nominal exchange rate (Q) can be treated as to be unity (i.e. Q=1).

III. THE MODEL AND FINDINGS

The model consists of eight identities and definitions and eight behavioural equations. All are reported in Table 1. Equation 1 is the balance-of-payments constraint. The terms on the right hand side indicates imports expenditure in local currency, whereas the first term on the left hand side is exports earnings and capital inflows to fill the saving gap of the economy. By assumption the distinction between exports and imports prices are ignored for simplicity and tractability of the solution. Both prices are assumed to be identical and represented by the price of tradable goods. The presence of large saving gaps is the important aspect of the small island economy under an economic embargo and expenditure by both private and public sectors are accounted for these saving gaps (namely H) as shown in equation 2. Equation 3, for example, shows the saving gap in the private sector and it is defined as the difference between investment and saving in the private sector. Equation 4, on the other hand, represents
the public sector saving gap as a difference between public expenditure and taxation. This term by definition is fiscal deficits (or surpluses in cases of positive values). In the case of North Cyprus, the public sector budget deficit is assumed to be financed fully by aid from Turkey.\(^5\)

Total output (and expenditure) consists of its tradable and non-tradable components as in equation 5. The structure of the economic system is described by the relative shares of these components. It is easily expected that the presence of economic embargo leads to an excessive reliance on non-tradable economic activities in the economy with its high share in total. General price level in (6) is defined as the weighted geometric average of tradable and non-tradable goods’ prices with the constant weight \((\alpha)\). Equation 7 is the definition of real exchange rate which is assumed to be composition of nominal exchange rate and the ratio of non-tradable and tradable goods’ prices. The immediate consequence of monetary union between North Cyprus and Turkey and the adaptation of Turkish Lira as a national currency are incorporated into the model by imposing the nominal exchange rate to be unity as in equation 8.

The first behavioural equation in (9) describes the demand for investment as a function of expenditure, whereas equation (10) is the saving function. Public expenditure is assumed to be positive function of aggregate expenditure in (11). Income tax, on the other hand, is assumed to be the revenue for the public sector, and can be described in (12). Total saving gap defined in (2) can be used to derive equation (13). Upon substituting (9)-(12) into equations (2)-(4), equation (13) can easily be derived. The composite parameter of \(\varepsilon\) in (13) can be defined as to be the marginal propensity of net injection to the economic system. As in the traditional Thirlwall – Hussain type growth models, exports is included in the model as an external demand component, and it is assumed to be a function of relative price and the income level of exports markets with constant price and income elasticities (namely \(\xi_1\) and \(\xi_2\)) respectively.\(^6\) Import demand as in equation (16), is on the other hand assumed to depend on relative price and income level of the North Cyprus economy. Import price and income elasticities are the fundamental parameters on which the Thirlwall law is based, and they are, thus, given by \(\tau_1\) and \(\tau_2\) respectively.

The solution of the model is straightforward and follows the well-known solution practice in the literature. Each variable in Table 1 are transformed into their growth

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\(^5\) The public sector in North Cyprus has historically been deficits, and the extent of these deficits has reached the highest value in 2009 with the value of 14 % of GNP, and it was largely financed aid and credit with low cost from Turkey (SPO, 2011).

\(^6\) Turkey can be considered as the only export market for North Cyprus. Therefore the activity variable in the export demand function is to be the income of Turkey.
versions by linearizing model given in (1)-(16) in logarithm. The resulting equations are reported in (17)-(22) of Table 2. Each variable written in small case in Table 2 indicates

**Table 1 – Modelling the balance-of-payment constraint and the income and expenditure balance of the North Cyprus economy**

<table>
<thead>
<tr>
<th><strong>Main identities and definitions:</strong></th>
<th></th>
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<tbody>
<tr>
<td>(XP_T + H = QMP_T,)</td>
<td>(1)</td>
</tr>
<tr>
<td>(H = K + AID,)</td>
<td>(2)</td>
</tr>
<tr>
<td>(K = I - S,)</td>
<td>(3)</td>
</tr>
<tr>
<td>(AID = G - T,)</td>
<td>(4)</td>
</tr>
<tr>
<td>(YP = Y_N P_N + Y_T P_T,)</td>
<td>(5)</td>
</tr>
<tr>
<td>(P = P_N^{\alpha} P_T^{1-\alpha}, \quad 0 &lt; \alpha &lt; 1)</td>
<td>(6)</td>
</tr>
<tr>
<td>(E = Q(P_N / P_T),)</td>
<td>(7)</td>
</tr>
<tr>
<td>(Q = 1.)</td>
<td>(8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Main behavioural equations:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(I = i_0 + i_1 PY, \quad i_0, i_1 &gt; 0)</td>
<td>(9)</td>
</tr>
<tr>
<td>(S = s_0 + s_1 PY, \quad s_0 &lt; 0, s_1 &gt; 0)</td>
<td>(10)</td>
</tr>
<tr>
<td>(G = g_0 + g_1 PY, \quad g_0, g_1 &gt; 0)</td>
<td>(11)</td>
</tr>
<tr>
<td>(T = tPY, \quad t &gt; 0)</td>
<td>(12)</td>
</tr>
<tr>
<td>(H = \varepsilon PY, \quad \varepsilon &gt; 0)</td>
<td>(13)</td>
</tr>
<tr>
<td>(\varepsilon = (i_1 + g_1) - (s_1 + t_1))</td>
<td>(14)</td>
</tr>
<tr>
<td>(X = \left(\frac{P}{P^*}\right)^{\xi_1} W^{\xi_2}, \quad \xi_1 &lt; 0, \xi_2 &gt; 0)</td>
<td>(15)</td>
</tr>
<tr>
<td>(M = \left(\frac{P}{P^*}\right)^{\tau_1} Y^{\tau_2}, \quad \tau_1 &lt; 0, \tau_2 &gt; 0)</td>
<td>(16)</td>
</tr>
</tbody>
</table>

where

- **\(X\)**: the real exports,
- **\(M\)**: the real imports,
- **\(G\)**: public expenditure,
- **\(T\)**: taxation,
- **\(I\)**: investment expenditure,
- **\(S\)**: savings,
- **\(H\)**: total resource gap of the economy,
- **\(P\)**: domestic prices,
- **\(P_N\)**: the price of tradable goods,
- **\(P_T\)**: the price of tradable good,
- **\(Y\)**: real total domestic income (or production),
- **\(W\)**: the real income level of Turkey,
- **\(Y_N\)**: the real non-tradable production,
- **\(Y_T\)**: the real tradable production,
- **\(AID\)**: aid from Turkey,
- **\(C\)**: capital inflows in the forms of net transfers from Turkey,
- **\(E\)**: real exchange rate,
- **\(Q\)**: nominal exchange rate.
Table 2 - The main identities and behavioural equations in the form of growth rates

Balance-of-payment equilibrium

$$\theta x - (1 - \theta)p_T + (1 - \theta)(p + y) - m = 0$$

(17)

$$h = \varepsilon(y + p)$$

(18)

$$p = \alpha p_N + (1 - \alpha)p_T$$

(19)

$$y = \alpha y_N + (1 - \alpha)y_T$$

(20)

$$x = \alpha \zeta_1(p_N - p_T) + \zeta_2w$$

(21)

$$m = \alpha \tau_1(p_N - p_T) + \tau_2y$$

(22)

where lower case variables show the growth rate of the relevant variable above; $\theta = XP_T/MP_T$ and $(1 - \theta) = ePY_T/MP_T$. The growth decompositions yielding the balance-of-payment equilibrium are given by the following growth equations:

$$y = (\pi_1/\pi_0)x + (\pi_2/\pi_0)e$$

(23)

where $e = (p_N - p_T)$ and

$$\pi_0 = (\tau_2 + \theta - 1),$$

$$\pi_1 = \theta,$$

$$\pi_2 = \alpha(1 - \theta + \tau_1).$$

(23a) (23b) (23c)

$\pi_0 > 0$ since $\tau_2 > 1$ and $\theta > 0$.

$\pi_1 > 0$ because $\theta > 0$.

$\pi_2 > 0$ since $(\theta + \tau_1) < 1$. This is because $|\tau_1| < 1$ but it is close to zero due to the high dependency level of the economy on Turkey for importation, and $\theta > 0$ but very small due to economic embargoes. In the case of the presence of strictly binding embargoes, $\theta = 0$, $\pi_2$ will certainly be positive.

its growth form. Equation (17) is, for example, the balance-of-payment condition written in growth form. Importantly, the parameter $\theta$ in (17) is named as the openness ratio, and it is defined as a ratio of exports and imports in nominal terms. This parameter is also considered as a policy parameter, and it is used to incorporate the effects of economic embargoes into the model by assuming its value zero. Another important element of the model is the parameter $\alpha$ in equation (19) and (29). This parameter represents the share of non-tradable economic activities in total, and the value of this parameter rises, as the importance of non-tradable sector increases by expending the demand for these activities in the economy. Additionally, the price and income elasticities of both exports and imports are assume to be structural parameters and to be constant in the short run. However, given the special features of the North Cyprus economy, we are able to restrict the values of these structural parameters as follows. The North Cyprus economy by definition is a small island economy and highly

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7 The growth rate counterpart of the each relevant behavioural equation is derived by taking the logarithms of the both sides of the equation, and then differentiating it with respect to time. If the relationship is given by an identity, then we first differentiate the both sides of the identity with respect to time, and then proceeds with an appropriate arrangement of the resulting relationship. Also note that $x = (1/X)(dX/dt)$. 

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dependent on the Turkish economy. This feature of the economy implies that the income elasticity of imports is expectedly higher than unity (i.e. $\tau_1 > 1$), whereas the price elasticity of imports is to be much lower than unity (i.e. $\tau_2 < 1$).

Equation (17) - (22) is simultaneously solved and the equation for economic growth is derived as in equation (23). This equation indicates various growth rates satisfying the balance-of-payment constraint. In accordance with (23), economic growth is demand driven and is determined by external demand (i.e. exports) and the domestic demand condition which is given by the differential between the inflation rates of tradable and non-tradable goods. In the absence of nominal foreign exchange rate, this differential can be regarded as the real exchange rate. Any positive value of this differential is referred to an inflation generated by an over expansion in non-tradable economic activities over those of tradable expenditure. Considering that the North Cyprus economy is very small and is under economic embargoes, the price of tradable should be taken as given and its inflation is zero by definition. Therefore, equation (23) can be re-written as follows under this assumption:

$$y = \left(\theta / (\tau_2 + \theta - 1)\right)x + (\alpha (1 - \theta - \tau_1) / (\tau_2 + \theta - 1))p_N$$  

(24)

According to (24), economic growth in a small island economy can be decomposed into two distinctive components. The first one is the external demand component given by growth in exports (i.e. $x$). The second component of economic growth is expectedly domestic demand, whose effect is represented by inflation in non-tradable goods’ prices (i.e. $p_N$). As discussed in Table 1, the structural features of the North Cyprus economy, given by the signs of import elasticities, secure the positivity of coefficients in (24). The first term on the right hand side indicates the effect of external demand on growth, whereas the second term shows the effect of domestic demand.\footnote{It is assumed that an expansion in domestic demand in non-tradable expenditure exhibits an inflationary effect due to the presence of the strictly binding supply constraint in the short run.}

(Equation 1 about here)

Economic growth satisfying the balance-of-payments condition can also be shown with a graph as seen in Figure 1. The figure is initially depicted by maintaining the assumption of strictly binding economic embargoes ($\theta = 0$), and external demand is accordingly ruled out from (24). In Figure 1, economic growth is shown on the vertical axis as inflation in the price of non-tradable goods is depicted on the horizontal axis. Assuming that an economic embargo is held strictly, the economic growth in (24) becomes a positive function of inflation which is generated by domestic demand.
expansion in non-tradable economic activities. The positivity of the coefficient of the inflation term secures the function to have a positively slope as seen in Figure 1. This linearly increasing line can be named as the balance-of-payments line (BOP line), and shows a positive relationship between an economic growth rate corresponding to a particular expenditure level and inflation in non-tradable goods' prices. In the case of no external demand, a domestic demand expansion becomes the only demand source for economic growth at the expense of inflationary cost. Any combination of various economic growth rates and inflation rates is to hold the balance of payments constraint along the BOP line. This is shown in Figure 2. For example at point 1, the economic growth rate indicated by \( y^1 \) corresponds only to the inflation rate \( p_N \) subject to the balance-of-payment constraint. Any expenditure and growth rate above \( y^1 \) is expected to yield deficits whereas those rate below \( y^1 \) results in surplus.\(^9\)

(Figure 2 and Figure 3 about here)

Allowing external demand moves the BOP line upwards as seen in Figure 3. Therefore the presence of external demand is to reduce the inflationary effects of domestic demand expansion for each growth rate.

**Demand-driven growth**

Equation (23) in Table 2 can now be used in order to reveal a number of economic results and helps us understanding the growth process in small island economies and those under an economic embargo. According to (23), external and domestic demand components are two crucial factors generating economic growth. However the later demand component reveals a cost, namely inflation, due to a supply capacity constraint in the non-tradable sector. In this regards, two important propositions together with their proofs can be put forward as follows.

The first proposition is related to the role of external demand as in Thirlwall (1979), and it is produced to examine under what condition the present model leads us to the well-known proposition in the literature.

**Proposition 1 (Thirlwall Law):** With the absence of a price differential between the tradable and non-tradable sectors (i.e. the real exchange rate remains unchanged) and income transfer, the real economic growth cannot exceed the rate given by the production of growth of real exports and the income elasticity of demand for imports.

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\(^9\) The deficit and surplus can occur only in case where the country is able to imports and export from Turkey. The presence of foreign trade allows the policy marker in North Cyprus both to speed up and slow down the economic growth. If economic embargoes are strictly imposed, then the economy moves only along the BOP line. Otherwise, the presence of deficits in the model above implies that external financial sources are implicitly provided in the form of aid from Turkey.
Proof: Since export earning is the only source of financing option of import expenditure, then $\theta = 1$. Equation (23) becomes the following

$$y = (1/\tau_2)x.$$  \hfill (25)

In an economy where the income elasticity of imports is higher than unity, the economic growth generation effect of export growth becomes lower than unity. If the income elasticity is lower than unity, then the growth in exportation has accelerating effects on economic growth. □

Proposition 1 implies that the Thirlwall law can be derived from the model presented in Table 1 and Table 2 as a special case. According to Proposition 1, this result can be derived only if the balance-of-payment constraint holds and the economy imports only by amount of exports earnings; in other words, foreign trade must be in balance ($\theta=1$), and there would be no other way of generating external resources other than exportation. External demand as the only source of economic growth will not be the option for an economy under a strictly binding economic embargo on foreign trade.

Another interesting result can be derived from the following proposition, and it can be used both for an economy like North Cyprus under economic embargo and those with having constant level of export earnings.

Proposition 2: (domestic demand driven growth) Under the assumptions of the presence of a strictly binding economic embargo on exports and the absence of inflation in the price of tradable goods’ prices, the real economic growth will be geared up only by the inflation in non-tradable goods’ which is accounted for domestic demand expansion in the non-tradable goods sector.

Proof: A strictly binding economic embargo (or the presence of the constant amount of export assumption) results in $\theta = 0$ (or $x = 0$) and equation (24) is reduced the following:

$$y = (\alpha(1 - \tau_1)/(\tau_2 - 1))p_N$$  \hfill (26)

where $p_T = 0$ due to the absence of inflation in tradable goods’ prices in accordance with the small country assumption. With the binding external demand constraint, the economy is left with no option but expanding only non-tradable sector expenditure in order for obtaining higher real economic growth. The partial derivative of equation (26) with respect to $p_N$ yields the following:

$$\frac{\partial y}{\partial p_N} = (\alpha(1 - \tau_1)/(\tau_2 - 1)) > 0.$$  \hfill (27)

The income elasticity of demand for imports higher than unity ($\tau_2 > 1$) and positive but very small value of $\tau_1$ (expectedly close to zero for an independent economy) provides the positivity of the coefficient on the right hand side in (27). □

This proposition is particularly important in the case of North Cyprus where the economy has only domestic demand as a demand source for economic growth. Despite the presence of exports to the Turkish market, North Cyprus is unable to increase its export capacity to this market. This is mainly because the production structure of the North Cyprus is not diversified enough to meet the different needs of the Turkish
market. Tourism and higher education are two important income generating economic activities, but they are severe competition pressure coming from the Turkish market and abroad. The agriculture of the North Cyprus economy is another sector that provides access to the Turkish market, but trade restriction and the presence of a severe competition by the Turkish agriculture sector are also restrict the North Cyprus economy’s ability to extend the export capacity to her only export market. Therefore it is plausible to impose the assumption at this stage that the level of exportation is given for the North Cyprus economy (see Günçavdı and Küçükçifçi, 2009).

Under such restricted environment, it is also plausible that the ability of the economy to generate economic growth expectedly relies only on domestic demand. In particular in a highly dependent small economy, the price of tradable goods can be taken as given, and its inflation in (23) becomes ineffective on the economic growth. Only domestic expenditure on tradable goods remains in hand as a demand tool to generate growth.\(^\text{10}\) While small countries under similar economic environment opt to use domestic expenditure on non-tradable goods to generate demand–driven growth, the response of the supply of these goods, to same extent, constitutes a cost in terms of inflation. However its extent of this cost is closely related to the responsiveness of supply condition of non-tradable goods sector together with other structural parameter as seen in (26).

Two components of demand factor evidently constitute the sources of economic growth. However it would be useful for an appropriate policy design to examine their relative importance in the process of economic growth. For this purpose the balance-of-payment constraint in equation (1) is assumed to hold without any saving gap as in proposition 1. In other words, \(H\) becomes to equal zero and \(\vartheta=1\). Under this assumption, the growth equation in (24) is reduced to the following:

\[
y = \frac{1}{\tau_2}(\alpha - \alpha \tau_1 p_N) \tag{27}
\]

Since \(\alpha \tau_1 < 1\) from (27), growth in external demand seems to generate higher economic growth than that of domestic demand expansion. This constitutes the importance in the economic growth process of removing economic embargoes and exporting in the case of North Cyprus. From (27), the growth generation capability of domestic demand appears to be dependent on the price elasticity of imports \((\tau_1)\) and the share of non-tradable expenditure \((\alpha)\). Both parameters are structural parameters and their values in the case of North Cyprus are closely related to the high dependence level of the economy on Turkey and the presence of economic embargoes. Also the

\(^{10}\) This is also considered as easy policy choice to generate economic growth in the short run for policy makers under a severe international competition pressure.
lack of external demand channel in the growth process dictates higher value for the share of domestic demand. In order examine the effect of the lack of export ability, it could be measure the extent of domestic demand requirement to compensate the growth generation impact of unit exports in the North Cyprus economy. In this regard, the coefficients of each demand components in (27) reveal that the same level of economic growth generated by an external demand growth can be obtained from domestic demand only if the expenditure on non-tradable sector is increased by \( \alpha \tau_1 \) times higher than export growth. This implies that external demand, rather than expansions in domestic expenditure in the non-tradable sector, is the most efficient way of generating economic growth.

**A contagion effect of inflation in Turkey**

High dependency of the North Cyprus economy on the Turkish economy increases its vulnerability and it exposes the economy to price shocks occurring in the Turkish economy. In particular, the presence of persistently high inflationary process in Turkey before 2002 had been accounted for worsening economic conditions and welfare losses in North Cyprus. Then such an undesirable situation had deteriorated the relationship between Turkey and North Cyprus by creating an extra demand for fiscal aid to compensate the welfare losses occurred by imported inflation. In this regard, equation (23) can be used to draw some results.

**Proposition 3:** If the country under economic embargo on exports is able to imports without any restriction, then negative shocks coming through tradable goods prices reduce the ability of the economy to generate economic growth.

**Proof:** Under a strictly binding economic embargo and free import assumption, \( \theta \) become zero. With no inflation in non-tradable goods’ prices by assumption, the growth equation (24) is reduced to the following:

\[
y = -p_T(a(1 - \tau_1)/(\tau_2 - 1)) \tag{28}
\]

where \( p_N = 0 \) due to the absence of inflation in non-tradable goods’ prices. The partial derivative of equation (28) with respect to \( p_T \) yields the following relationship:

\[
dy/dp_T = -(a(1 - \tau_1)/(\tau_2 - 1)) < 0 \tag{29}
\]

With the binding external demand constraint, even if importation is limitedly allowed, then economic growth in the North Cyprus economy is to be exposed to all negative price shocks from Turkey. \( \square \)

Proposition 3 clearly shows that imported inflation from Turkey has deteriorating effects on the economic growth generation process in North Cyprus. This effect urges the policy maker in North Cyprus to compensate welfare losses by expanding domestic expenditure on non-tradable economic activities, and this immediately requires extra
financial aid from Turkey. It is now plausible to examine whether or not such an expansion in non-tradable expenditure under negative price shocks has a compensating effect on economic growth in North Cyprus.

**Proposition 4:** With a strictly binding economic embargo on exports, if the country is able to imports without any restriction, then negative shocks coming through tradable goods prices reduce the ability of the economy to generate economic growth. An expansion in non-tradable expenditure possesses a compensating effect on economic growth.

**Proof:** Imposing a strictly binding economic embargo yields growth equation in (28), and its partial derivative with respect to the share of non-tradable expenditure (α):

\[
\frac{dy}{dp_T}/d\alpha = -\left((1 - \tau_1)/(\tau_2 - 1)\right) < 0
\]

(30) shows that deteriorating impacts of negative price shocks in the tradable sector is reduced by increasing domestic expenditure on non-tradable economic activities. This compensating effect depends on the size of price and income elasticities of import.

According to (30), an increase in the capacity of importation, as holding the level of exports is held constant, exposes the North Cyprus economy more to these negative prices shocks. However, North Cyprus is expected to gain extra growth generation capability after economic embargos being removed and gaining ability to exports more. This is examined in the following section.

**Benefits from removing economic embargo**

The most important economic constraint that the North Cyprus economy encounters is the presence of economic embargos. This constraint restricts the economy to access to exports markets in order to earn foreign exchange income. It is expected that the North Cyprus economy gains the ability to improve her economic growth by the removal of the economic embargo and, if not, by increasing export to Turkey. The following propositions examine the importance of this constraint.

First, the removal of economic embargoes has been put forward for the peaceful settlement of the political dispute in the island by the Turkish side. This may be seen as an indication of a good will by the Turkish side, but it must be examine whether or not such move might have an immediate positive economic effect. In this regard, the impact of the removal of economic embargo is examined in the following proposition.

**Proposition 5:** An increase in the level of openness (i.e. \(\theta=0\)) contributes to the economic growth process positively if the import price elasticity is inelastic and the import of the economy depends heavily on the foreign market.

**Proof:** Equation (23) is derived with respect to \(\theta\), and then the following is obtained:
\[
dy/d\theta = [(\tau_2 - 1) - \alpha(\tau_2 - \tau_1)]/(\tau_2 + \theta - 1)^2
\]  
(31)

The sign of (31) is undetermined and requires an additional condition. It is already known that the denominator is always positive. In order to have the sign of whole term to be positive, the numerator must be positive as well. To obtain this positive sign of (31), the following condition must be satisfied:

\[
\alpha < (\tau_2 - 1)/(\tau_2 - \tau_1)
\]  
(32)

This is the condition which is required to have positive growth effect of removing economic embargoes. The import elasticities in (32) are both structural parameters and their values are constant in the short run. In fact changes in their values require an implementation of structural changes in the economy. According to (32), the share of non-tradable sector must be lower than the term obtained as product of import elasticities in order to have a positive growth effect after the removal of the economic embargo. In other words, removal is necessary, but not satisfactory condition to have this positive effect in short run. Along with negotiating this removal, the policy maker in North Cyprus must also implement policy measures to reduce its dependency by reducing \(\tau_2\) and increasing \(\tau_1\). However in the short run, these elasticities can be taken as given, but the share of non-tradable expenditure must be brought to the level dictated by the values of these elasticities as seen in (32).

This is of course not the only impact of removing economic embargoes. It is also plausible to anticipate that an increase in the openness level of the economy might influence the growth effect of non-tradable expenditure. The following proposition examines this issue.

**Proposition 6:** Removing economic embargo and an increase in the level of openness decrease the economic growth rate generated by domestic demand expansion in non-tradable goods in the short run.

**Proof:** The partial derivative of (26) with respect to the openness ratio \((\theta)\) yields the following:

\[
(dy/dP_N)/d\theta = [-\alpha((\tau_2 - \tau_1))/(\tau_2 + \theta - 1)^2] < 0.
\]  
(33)

The income elasticity of imports is expected to be higher than unity in a highly import dependent economy, whereas the price elasticity is negative and is much lower than unity. Therefore the term \((\tau_2 - \tau_1)\) becomes positive. The sign of the term in the denominator is positive due to its square. □

Proposition 6 implies that once the economy embargo is removed and the openness level is gradually increased, the economic growth gained from an expansion in export is substituted for growth generated from domestic demand. This can be considered as a substitution effect on growth of openness.

Propositions (1)-(6) overwhelmingly show the importance of demand factor in the economic growth rate process. It also is evident that domestic demand becomes the crucial factor due to the presence of trade restrictions on external demand. However the reliance of the economy on domestic demand should be reduced after the removal of trade restrictions.
Who’s paying welfare gains in the North Cyprus economy?

In order to understand the demand-driven growth process in North Cyprus, the question of how much domestic demand is required to generate positive economic growth in the absence of external demand. Besides, the lack of satisfactory financial resources in the North Cypriot economy leaves no option to the policy maker, other than relying on aid and capital inflows from Turkey to finance domestic demand. The following proposition then examines the sources of welfare gains generated by demand-driven growth.

**Proposition 7:** With the limited access to export markets (mainly via Turkey, therefore $0<\theta<<1$) and high import dependency (higher income elasticity of import than unity), the growth-generating expansion in domestic demand for non-tradable expenditure (i.e. $\Delta\alpha>0$) must exceed capital inflows over expenditure on imports. The minimum level of the required capital inflows over import expenditure is given by the income elasticity of imports.

**Proof:** From (23), the partial derivation with respect to the non-tradable goods price yields the effects of domestic demand expansions on economic growth as follows:

$$\frac{dy}{dP_N} = \{\alpha(1-\theta-\tau_1)/(\tau_2 + \theta - 1) > 0\} \tag{34}$$

(34) is the general case regarding the impact on economic growth of non-tradable inflation. Condition (27) in Proposition 2 can be derived as a special case where $\theta = 1$. In order to have the effect of domestic demand expansion, (34) can be derived once more time with respect to $\alpha$ as follows:

$$\left(\frac{dy}{dP_N}\right)/d\alpha = \{(1-\theta-\tau_1)/(\tau_2 + \theta - 1) > 0\} \tag{35}$$

Since $\tau_2 > 1, |\tau_1| < 1$ and $\theta > 0$, then

$$(1-\theta-\tau_1) > 0 \tag{36a}$$

$$\tau_2 + \theta - 1 > 0 \tag{36b}$$

(36) can also be re-written as follows:

$$\tau_2 > (1-\theta) \tag{37a}$$

$$\tau_1 < (1-\theta) \tag{37b}$$

In Table 2, it is given that $(1-\theta) = \varepsilon PY/MP_T$. Upon substituting this definition in (37), the following can be obtained:

$$\tau_2 > \varepsilon PY/MP_T \tag{38a}$$

$$\tau_1 < \varepsilon PY/MP_T \tag{38b}$$

Since $\varepsilon = H/PY$ from (13), the following condition can be obtained:

$$\tau_2 > H/MP_T \tag{39a}$$

$$\tau_1 < H/MP_T \tag{39b}$$

From (39a) and (39b), the following condition for the required level of external resources to finance domestic demand expansion can be written:

$$\tau_1 < H/MP_T < \tau_2 \tag{40}$$
where \( \tau_1 < 0, \tau_2 > 1 \). \( H/MP_f \) corresponds to the level of external resource as a ratio of import expenditure; the lower value of this ratio is determined by the price elasticity of imports, and implies saving outflows. On the other hand, positives values indicate capital inflows, and its upper bound is dictated by the income elasticity of import. According to (40), the saving gap of the economy (as a ratio of import expenditure) that is acquired after an increase in non-tradable sector share in total expenditure must be between income and income elasticities of imports. □

The condition described in (40) indicates the level of financial resources that are required to generate a positive economic growth by expending non-tradable expenditure. Accordingly the extent of this requirement of extra resources is determined by two structural parameters, namely the price elasticity and income elasticity of imports. If we assume that the balance-of-payment constraint in (1) holds ex post, this requirement can also be considered as additional finance to exports earnings. As the additional resource ratio as in (40) approaches income elasticity of imports, it can be expected to have relatively higher economic growth effects of the usage of these additional resources without deteriorating the balance-of-payment condition, vice versa.

As indicated in (1) and (2) in Table 1, \( H \) is described as the amount of financial resources required, and its level is given by the difference between imports and exports. Of course, the presence of exports expectedly reduces this requirement. In case of balance trade, the financial resources provided by exports earnings will be satisfactory, and economic growth is determined by the export growth and income elasticity of imports. This is postulated by the Thirlwall law. However, in the case of the presence of resource gap, export earnings will be insufficient and the economy under investigation will be in need of additional financial resources other than exports earning to generate positive growth. In case of North Cyprus, direct aids adopting Turkish lira as a national currency to become a part of Turkish financial markets help the North Cyprus economy obtaining these additional financial resources from Turkey with minimum costs.

**IV. CONCLUSION**

The paper examines the determinants and main constraints of the economic growth process of a small island economy under economic embargoes, namely North Cyprus. Some features of the economic structure of this economy allow us to extend the well-known demand driven growth model in the literature. Our investigation is based upon the theoretical framework brought forward by Thirlwall (1979). The Thirlwall model is extended by including both the distinction between tradable and non-tradable outputs as well as the practice of a monetary union. Also the presence of the economic embargo
is incorporated into the model in order to examine the features of the economic growth processes in the absence of export earnings. The well-known Thirlwall law is also derived from the model in this paper as a special case where the foreign trade of the economy exists and it is in balance.

The first result of our investigation is that in the absence of exports non-tradable expenditure becomes the only demand component that is required for economic growth. As long as economic embargoes last, despite its inflationary consequences, the policy maker in North Cyprus becomes increasingly more relying on non-tradable expenditure to generate economic growth. Our investigation also shows that removing economic embargo and allowing North Cyprus to exports to the world market paves way of generating positive growth through external demand without inflationary consequences in the domestic economy. The second results of our investigation reveal the fact that the dependency on Turkey is exposed the North Cyprus economy to losses in growth in case of price shocks in tradable goods sector. This is particularly important due to the presence of the long standing high and chronic inflationary experience of the Turkish economy. In this regard, our examination shows that further demand expansion in the demand for non-tradable goods becomes the only policy option to compensate these losses in economic growth.

Despite the ongoing debate on having a national currency, this research also shows that as the monetary union with Turkey is the most important and costless way of generating resources to fill in the saving gap of the North Cyprus economy. This should be inevitable considered as the pre-condition of economic growth process complying with the balance-of-payment constraint. As long as economic embargoes, particularly on exports, last, issuing national currency appears to reduce the ability of the economy to generate positive economic growth and, most importantly this inevitable incurs high cost for high economic growth in terms of inflation.

**Reference**


Figure 1 - Balance-of-payments line

Figure 2 – Imbalances in balance-of-payments line
Figure 3 – Export growth and balance-of-payments line