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The growth performance and prospects in the Euro area: a balance-of-payments approach

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Abstract. This paper aims to apply the balance of payments constrained-growth model to explain Euro area growth performance in the last forty years and to discuss likely prospects for the future. After a formal reconsideration of the long-run and short-run arguments supporting the validity of the Post-Keynesian approach to economic growth, a simplified and an extended version of the basic model are outlined. The application of these models to the Euro area experience shows that Thirlwall's Law performs quite well in explaining growth in all decades under consideration. The fundamental reasons behind the recent unsatisfactory EMU growth experience, therefore, appear to be a decreasing export dynamics and a rising dependence on imports. Given current trends, the prospects for the future appear to be gloomy, unless structural reforms of the productive system are promoted in order to improve overall EMU competitiveness.

Keywords: Growth, Euro area, Thirlwall's Law, balance-of-payments constraint, import and export functions
JEL Classification: E12, F14, O40, O52

1. Introduction

The European Monetary Union (EMU) has recently been characterised by a continuous slowdown in economic growth. The most recent Eurostat data show that the Eurozone GDP growth rate in 2012 was -0.7%, with a mean of -0.2% in the last five years and of 1.0% in the last decade.[1] This outcome is at variance with the USA experience, which recorded mean growth rates of 0.8% and 1.8% respectively in the last five and ten years. In fact, in the United States, after the recession of 2008-2009, overall economic performance has been satisfactory, with a growth rate in 2012 of 2.8%. In discussing the reasons behind the dissimilar growth pattern on the two sides of the Atlantic, most commentators have stressed the role played by the different economic stabilisation policies in general and the budgetary policy stance in particular. While in the USA intervention has been rapid, intense and unconstrained, in Europe anticyclical policies have been slow, weak and limited by existing institutional arrangements. With reference to fiscal policy, in particular, the Stability and Growth Pact has not permitted an expansion of budget deficits in line with needs. It is interesting to note that most analysts have indicated the slowdown in internal demand as the main cause of the current recession in Europe, as a result of restrictive fiscal policies and low confidence levels of both households and firms. However, the fact that exports have grown at an average annual rate of only 1.8% in the last 5 years, compared to the 3.6% in the USA, is seldom emphasised.

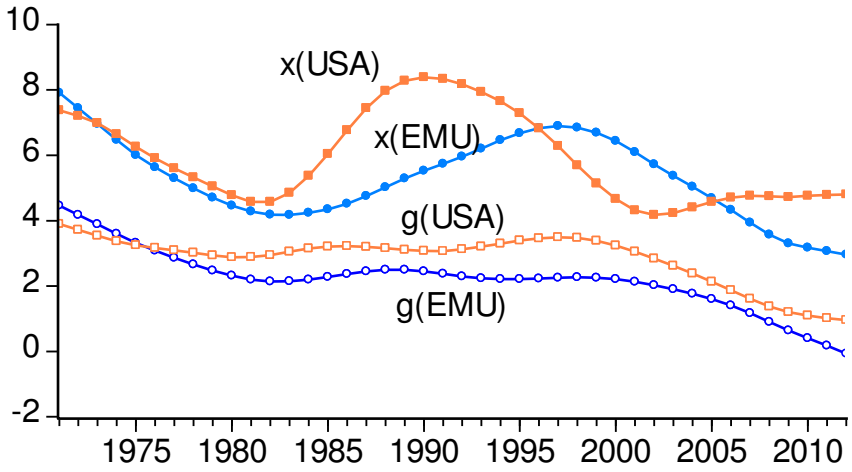
The unsatisfactory economic performance that has so far characterised the 21st century in Europe is not however a completely new phenomenon, from either a temporal or a geographical point of view. Figure 1 reports export and GDP growth performance in EMU countries in the last forty years, compared with the United States, which is used as a benchmark.[2] In order to better appreciate the different features of growth performance in the Eurozone and the United States, the graph shows the trends

[1] Although in this paper we make reference to the Eurozone experience, EU28 figures are similar, with a recorded growth rate of -0.4% in 2012, and -0.2% and 1.2% in the last five and ten years respectively. Average values are of course compatible with different performances of single member states. For instance the lowest GDP growth rate in EMU in the last five years is recorded by Greece (-4.3%), while the highest rate is that of Slovakia (2%). Lowest and highest rates In the last ten years in the Euro area are those of Italy (-0.1%) and Slovakia (4.6%).

[2] Note that we are discussing the Euro area experience as a whole starting from 1970, even though the EMU was created only in 1999.

in the annual growth rates of GDP and exports, calculated applying a Hodrick-Prescott filter to the original series.

Fig. 1 – Trends in Export and GDP growth rates (Hodrick-Prescott filter transformation) for the USA and the EMU, 1970-2012



Note: The labels x and g indicate the export and GDP growth rates in the two areas.
Data sources: World Bank (WDI) and IMF (WEO database).

The 1970s show similar paths and values for the two variables on the two sides of the Atlantic, although in this decade the USA overtakes the future EMU countries. The gap in GDP growth rates becomes higher in the 1980s (3.2% vs. 2.3%), when the US export performance outdistances Europe, and persists in the 1990s, the decade of the 'new economy', when the average GDP growth rate in the Eurozone scores only 2.1% against 3.2% in the USA. Since 2000, the slowdown in EMU performance has been substantial. The USA at first follows the same path, but in more recent years it shows a recovery not shared by the Euro area, where the growth trend continues to fall. Slowdown in EMU countries export growth rate starts in 1998 after two decades of pronounced increase and keeps on declining. The US export growth rate, on the other hand, after a decade of downfall, inverts the trend in 2002 and subsequently maintains a satisfactory growth path. Figure 1 also shows a high correlation between export and GDP growth trends in the Eurozone, which is relevant for the analysis and discussion in this paper.

According to mainstream economics, long-run growth is explained by supply factors alone, so that the ultimate reasons for the poor European performance lie in the reduced rate of change of the labour force and the slow pace of technological progress.

Sometimes demand side considerations are mentioned, at least for the 1990s, emphasising the role of a series of adverse shocks hitting Europe in that decade, some of which were self-inflicted, in the process of economic convergence required for launching the EMU (Blanchard and Wolfers, 2000). But apart from phenomena of hysteresis, perhaps made worse by inefficient institutions, demand side considerations are generally overlooked in growth theory and empirics. Thus the ultimate suggestion for a more sustained economic growth in Europe is to implement a few but "necessary" structural reforms of the labour and product markets, so that free-competition-oriented supply forces can display their full potential. With reference to the 2000s and the global financial crisis, a recent contribution (Blankenburg et al., 2013) highlights that the orthodox interpretation - at least in the core European countries dominating economic policy-making – is that it is a fiscal crisis, caused by governments' financial profligagy and resultant public deficits in peripheral countries. This mainstream point of view is challenged by a minority of scholars belonging to the Keynesian tradition, who argue that effective demand is the engine of economic growth, in the long-run as well as in the short-run, and supply factors adapt to GDP changes (see Setterfield, 2002 as an example of this alternative approach). According to Kaldor's approach, in particular, the fundamental determinants of a country's growth rate lie in the evolution of the exogenous components of aggregate demand, which, in the case of open economies, are basically constituted by exports.[3] Building on the work of Kaldor and Harrod-Johnson, Thirlwall proposes a model showing that the growth process of open economies is constrained by the need for equilibrium in the balance of payments, and more precisely in the Current Account (CA). Thirlwall thus derives a 'law' capable of describing the determinants of the actual growth rates experienced by world economies and the differences in international growth performances (see among others Thirlwall, 1979; McCombie and Thirlwall, 1994; Davidson, 1997).[4] In recent years a number of scholars have tested this 'law' with regard to different developing and developed countries (see

[3] The other possible exogenous component of aggregate demand is of course government expenditure, but according to the now prevailing orthodox principles of public finance, while in the short run anticyclical stabilisation policies – and thus deficits – are allowed, government budgets have to be balanced in the long run. This theoretical position has been institutionally formalised in Europe by the Stability and Growth Pact, aiming at promoting a balanced "structural" budget. In this context public expenditure is no longer exogenous, being constrained by the level of government taxation.

[4] A recent summary of the birth and development of Thirlwall's Law appeared in the PSL Quarterly Review, vol. 64, n. 259 (2011).

McCombie and Thirlwall, 2004 for a collection of key essays on the topic until 2004), also using updated econometric techniques in order to take into account cointegration issues (see inter alia Alonso, 1999; Britto and McCombie, 2009; Felipe et al., 2010; Gouvea and Lima, 2010; Tharnpanich and McCombie, 2013). The validity of Thirlwall's Law has been broadly verified, although the derived policy suggestions still find scarce application in actual policies.

This paper follows the Post-Keynesian approach described above and applies it to the experience of the Euro area in order to find out whether it can explain the empirical evidence outlined in this introduction. The rest of the paper is organised as follows. The next Section reassesses the reasons behind the alleged existence of an external constraint to growth and investigates its true nature. In particular, we derive the CA constraint to growth with reference to the sustainability of foreign debt and the resilience of economic systems to currency crises in the short run. Section 3 develops a formal model in the Thirlwall tradition designed to analyse growth performance in Europe. The innovative features of this model are: (i) the inclusion of the terms of trade rather than the real exchange rate in the definition of the constrained growth rate; (ii) an extension of Thirlwall's basic model to include other CA flows besides exports and imports; (iii) the possibility for government authorities to pursue a CA target different from zero. In Section 4 the particular features of the Eurozone growth performance are compared with the theoretical indications derived from the model. This analysis shows that the key reasons for unsatisfactory EMU growth performance lie in the declining export dynamics and in the increased income elasticity of imports. In Section 5, EMU export and import demands are estimated, both for the whole time period 1970-2012 and for rolling sub-periods, in order to verify whether the basic scale elasticities are following divergent paths and whether the new structural conditions are constraining the Euro area growth and to what extent. The final Section offers some conclusions and outlines prospects for the future.

2. Reasons and nature of an external constraint to growth

The reasons for the alleged existence of an external constraint to growth, in a perspective not limited to the short run,[5] and the true nature of this constraint can be easily ascertained. To this end, it is sufficient to examine the consequences, in terms of long-term foreign debt sustainability and short-term financial instability, of a policy aiming at maintaining an overall balance of payments equilibrium by compensating a structural CA disequilibrium by means of capital inflows.[6] The balance of payments (BP) is composed of the current account (CA) and of the capital and the financial accounts, which for the sake of simplicity we lump together into a single broad capital account (KA).[7] Since all sections of the balance of payments, including foreign reserves variations, must add up to zero, we may write:

$$(1) \qquad BP = CA + KA = 0$$

Now let us suppose that a CA deficit ($CA<0$) is exactly compensated for by net capital inflows from overseas ($KA>0$). This will lead through time to an accumulation of foreign debt (F). For the sake of simplicity let us assume, as in Thirlwall's basic model, that the CA consists only of exports and imports of goods and services (as in the national accounts definition of foreign transaction contribution to GDP). A CA deficit would thus correspond to a structural excess of imports (M) over exports (X), an excess we label net imports (NM).[8] But the accumulation of foreign debt will also require interest payments abroad, given by iF, where i is the (nominal) domestic interest rate. The policy we are considering, and defined by expression (1), can be formalised by the following equation:

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[5] Of course the balance of payments can be in disequilibrium in the short run for a repeated number of periods. But, as the literature assumes, in a long-run perspective an equilibrium must be reached and maintained.

[6] There are several historical examples of countries where this policy has been followed: Mexico and other Latin American countries in the early 1980s, Italy in the second half of the 1980s and early 1990s, South East Asian countries and Argentina in the 1990s, to mention a few. In all cases the policy proved to be unsustainable and led to a currency crisis.

[7] The current account includes goods and services transactions, plus income and current unilateral transfers. The capital and financial accounts include respectively (i) capital transfers and acquisitions or disposals of non-produced, non-financial assets; (ii) financial assets and liabilities transfers.

(2) $NM + iF = \Delta F$.

For the sake of simplicity, we assume to operate in continuous time, so that ΔF is replaced by $\dot{F}$, where $\dot{F}$ is the derivative of foreign debt with respect to time. In order to describe the issue of sustainability more clearly,[9] it is convenient to relate all variables appearing in Eq. (2) to the value of nominal income (Y). Using small-case letters to indicate the derived ratios, we have:

(3) $nm + if = \frac{\dot{F}}{Y}$.

Now, since by definition we have:

(4) $\dot{f} = \frac{\dot{F}Y - F\dot{Y}}{Y^2} = \frac{\dot{F}}{Y} - f\frac{\dot{Y}}{Y}$

if we substitute Eq. (3) into (4) and rearrange we obtain:

(5) $\dot{f} = nm + if - \frac{\dot{Y}}{Y} f = nm + (r - g) f$

where $r = i - \pi$ is the real rate of interest; $g = \frac{\dot{Y}}{Y} - \pi$ is the real rate of growth and π is the rate of inflation, which is included both in the nominal interest rate and in the nominal rate of growth of GDP.

Expression (5) is a (linear) first order differential equation that can be used to describe the dynamics of the foreign debt/income ratio over time. Since net imports are positive, if the rate of interest is greater than the rate of growth ($r > g$) the ratio f will tend to grow without limits. Only when $r < g$, will the ratio tend to a finite equilibrium

[8] As shown in the next section, a consideration of all CA flows would simply require adding the balance of income and unilateral transfers, net of interest payments, to net imports.
[9] The analysis of sustainability basically follows the seminal contribution by Sargent and Wallace (1985). For an early application of this approach to the problem of foreign debt sustainability, see Bianchi (1994).

value.[10] In the first case (r>g) a clear problem of sustainability occurs, since international investors will not allow their holdings of foreign debt issued by a single country to increase without limits, as they wish to diversify risk. There will thus be an upper limit to the amount of foreign debt that a country can accumulate; and this limit can easily be exceeded even in the more favourable second case (r<g), if the equilibrium ratio is too high, especially when nm is large and the difference between g and r is low.[11] When the upper bound to the foreign debt/income ratio is reached, no more capital inflows can be obtained, so that the policy becomes unsustainable and the country will have to take extraordinary measures to stop the ratio from further increasing.[12] In particular, if the CA is brought to balance, the overall balance of payments will be in equilibrium even in the absence of capital flows.

Well before the occurrence of a sustainability problem, however, a policy of compensating CA deficits with capital inflows may give rise to short-run financial instability and eventually lead to its abandonment in favour of a balanced CA. This is because the two components of the balance of payments are of a different nature and respond to different determinants. CA payments and receipts are flows that tend to re-occurr over time, other things being equal, in an unchanged measure. Capital movements, on the other hand, are changes in the stock of financial wealth that must be continuously stimulated and replaced. They are also highly subjective and volatile, so that their destination can suddenly change if wealth-holders' opinions about a country's reliability or expectations about the exchange rate or the interest rate behaviour change. When this happens, there is a sudden capital outflow and a currency crisis occurs, compelling the country to adopt deflationary measures in order to reduce imports and re-establish international investors' confidence so as to re-stimulate capital inflows. Of course, this kind of financial instability can be avoided if the CA is in equilibrium, since in this case there is no dependence on foreign capitals to achieve an overall balance of payments equilibrium. Therefore, both long-term considerations of guaranteeing foreign

[10] This equilibrium value is given by $f^* = \frac{nm}{g - r}$, which will be positive only if g>r.

[11] In all real-world experiences of countries adopting the policy of compensating a CA deficit with capital inflows, the rate of interest ultimately turned out to be greater than the rate of growth.

[12] These measures will normally consist of a devaluation of the domestic currency and the adoption of restrictive stabilisation policies in order to reduce the level of income and thus imports. In extreme cases a partial or total default on foreign debt might be declared.

debt sustainability and short-term considerations of preventing financial instability lead to the conclusion that in general a CA equilibrium should be maintained over time. This implies that open economies face an external constraint to growth and that the true nature of the constraint relates to the CA rather than to the balance of payments as a whole.[13] If the CA, in a medium/long-run perspective, has to be kept in equilibrium this will set an upper limit to the growth rate that a country can achieve. The determinants of this limit are investigated in the next Section.

3. A basic model of externally constrained growth and some possible extensions

A basic model defining the maximum rate of growth compatible with a balance of payments constraint was developed by Thirlwall in a series of influential papers (Thirlwall, 1979; McCombie and Thirlwall, 1994). In what follows we shall present a simple, slightly modified version of the original model, meant to capture its main essence and capable of being utilised for practical purposes. We assume again, at least initially, that the CA consists of exports and imports of goods and services only. Hence, as explained in the previous Section, the condition that the CA should be balanced in equilibrium requires that the value of exports (X) be equal to the value of imports (M). We thus have:

$$X = M. \tag{6}$$

The value of exports corresponds to the product of a price index (p_x) times a volume index (x) and the same holds true for imports so that $M = p_m m$. Furthermore both nominal values should be expressed in the same currency, so that an exchange rate must be used for the necessary conversion. If we suppose that the price of imports is already appropriately expressed in domestic prices, the CA equilibrium will be defined by the condition:

[13] The empirical evidence appears to supports this claim. In the period 1970-2012 considered in this paper, the CA balance of EMU countries shows continuous oscillations around zero, with an overall average of 0.16% of GDP. However, it should be noted that the overall Eurozone CA equilibrium hides wide imbalances across member states: in fact Germany has a huge surplus substantially compensated by the cumulative deficits of all other countries.

(7) $p_x x = p_m m .$

The ratio between export and import prices in a common currency defines the value of the terms of trade (τ). Introducing their definition into Eq. (7), we may write:

(8) $\tau x = m .$

For ease of notation and calculation, we use the natural logarithms of the previously defined variables, and indicate them with a tilde over each one, so that, for instance, $\tilde{x} = \log(x)$. Thanks to log properties, we have thus:

(9) $\tilde{\tau} + \tilde{x} = \tilde{m},$

If we differentiate Eq. (9) with respect to time, and recall that the logarithmic time derivative of a variable is equivalent to its proportionate rate of change over time,[14] we may write:

(10) $\dot{\tilde{\tau}} + \dot{\tilde{x}} = \dot{\tilde{m}}$

Finally we recall that, according to its definition, the elasticity of imports with respect to income is the ratio between the proportionate rate of changes of the two variables, so that we have:

(11) $\varepsilon_m = \frac{\dot{\tilde{m}}}{\dot{\tilde{y}}} = \frac{\dot{\tilde{m}}}{g}$

where $\dot{\tilde{y}} = g$ stands for the proportionate rate of growth of real income (or GDP). By substituting definition (11) into Eq. (10) and rearranging terms, we finally obtain:

[14] Recall that, for instance, $\dot{\tilde{x}} = \frac{d\tilde{x}}{dt} = \frac{d(\log(x))}{dt} = \frac{1}{x}\frac{dx}{dt} \cong \frac{\dot{x}}{x} \cong \hat{x}$ where $\hat{x}$ is the percentage rate of change in discrete time.

$$(12) \qquad g_b^* = \frac{\dot{\tilde{x}} + \dot{\tilde{\tau}}}{\varepsilon_m} \cong \frac{\hat{x} + \hat{\tau}}{\varepsilon_m}$$

where g_b^* stands for the constrained growth rate derived from the basic model (as in Thirlwall's standard analysis).[15] This is the expression we were looking for, since it defines the maximum growth rate of GDP compatible with maintaining a continuous CA equilibrium over time. This rate therefore depends on three crucial variables: i) the growth rate of exports; ii) the rate of change of the terms of trade; iii) the income elasticity of imports.

The basic model so far overlooks two important facts: a) the CA also includes net income payments and receipts (e.g. work and capital remunerations, interest payments, etc.) and unilateral transfers (e.g. donations, international aid, worker remittances, etc.); b) although in a long-run perspective the CA must be balanced, over shorter periods of time disequilibria may exist. This allows (or constrains) government authorities to pursue a CA target different from zero. In what follows, the basic model is extended to take into account the two facts above illustrated. So let T indicate the net balance of all income and unilateral transfers, which may be positive or negative.[16] By definition of CA balance, we have:

$$(13) \qquad CA = p_x x + T - p_m m .$$

We now express the CA balance as a proportion of imports ($ca = \frac{CA}{p_m m}$) and the net income and unilateral transfers balance as a proportion of exports ($t = \frac{T}{p_x x}$). Rearranging terms, definition (13) can be rewritten as follows:

[15] Obviously in discrete time without logarithmic approximation the numerator of Eq. (12) would be equal to $\hat{x} + \hat{\tau} + \hat{x}\hat{\tau}$.

[16] In the actual EMU experience, T was positive until 1990, and increasingly negative afterwards. The sign reversion was mainly due to interest rate payments on foreign debt by indebted EMU countries and overseas worker remittances.

(14) $p_x x(1+t) = p_m m(1+ca)$.

Using logs again, differentiating with respect to time and recalling that $\log(1+t) \cong t$ and similarly $\log(1+ca) \cong ca$, a few algebraic manipulations finally yield:

(15) $$g_e^* = \frac{\dot{\tilde{x}} + \dot{\tilde{\tau}} + \Delta t - \Delta ca}{\varepsilon_m} \cong \frac{\hat{x} + \hat{\tau} + \Delta t - \Delta ca}{\varepsilon_m}$$

where Δt and Δca indicate the possible changes over time in the net transfers ratio and in the CA ratio respectively, and g_e^* is the constrained growth rate derived from the extended model.[17]

The extension of the basic model proposed in this paper is fundamentally different from other suggestions found in the literature (Thirlwall and Hussein, 1982; McCombie and Thirlwall, 1997; Moreno-Brid, 2003. See Thirlwall (2011), sections 10, 11 and 12 for a survey of these models). In those proposals the GDP constrained growth rate is obtained either as a weighted average of trade flows and capital transfers or by introducing specific hypotheses about the CA equilibrium. Our proposal, on the other hand, maintains Thirlwall's basic assumption that the real constraint to growth is given by the CA equilibrium, since capital movements are volatile and non-repetitive, cannot be relied on to finance a structural CA deficit continuously, and can generate problems of foreign debt sustainability. Our extension, furthermore, explicitly considers the influence of income payments and unilateral transfers and allows for different targets of government authorities relating to the dynamics of inherited CA imbalances. So if these two ratios remain constant, we return to Eq. (12) of the basic model. But, if a country experiences an increasing burden from net income payments and unilateral transfers

[17] Equation (15) is actually an approximation of the true constrained growth rate due to the use of logarithms and continuous time. The correct formula for the constrained growth rate without log-approximation in discrete time would be

(15') $$g_e^* = \frac{(\hat{x} + \hat{\tau})\left(1 + \frac{\Delta t}{1+t}\right) + \hat{x}\hat{\tau} + \frac{\Delta t}{1+t} - \frac{\Delta ca}{1+ca}}{\varepsilon_m\left(1 + \frac{\Delta ca}{1+ca}\right)}.$$

and/or inherits an initial deficit that has to be gradually eliminated or reduced over time, this will necessarily lead to a decrease in the achievable rate of growth.

It should be noted that Eq. (15) is an identity or a decomposition of the actual GDP growth rate into components related to the CA flows. g_e^*, however, can still be identified as the balance-of-payments constrained growth rate in the Thirlwall tradition if we suppose, as actually happens, that governments pursue a specific target with regard to Δca, which in general is set at zero, but may differ, especially if an inherited deficit is to be eliminated in a given period of time. It is also interesting to note that the solution for the constrained growth rate (g_e^*) in the extended model, as expressed by Eq. (15), clarifies that Thirlwall's analysis can also be applied to countries experiencing CA deficits (and even surpluses). In fact, if governments wish to maintain a constant relative deficit (or surplus), the basic model still applies. Hence the model is also appropriate to examine the cases of countries like China and Japan, which are, so to speak, voluntarily balance-of-payments constrained. Moreover, if a country like for instance the USA can rely on the possibility of increasing its relative deficit over time, this implies a relaxation of the constraint to growth yielded by the basic model.

4. An application of the externally constrained-growth model to the Euro area experience

The above illustrated analysis can be applied to the actual experience of the Euro area to see whether the growth rates might have been externally constrained. In doing so we shall refer both to the basic model (Eq. 12) and to the extended one (Eq. 15) to capture the influence of the newly introduced variables.

The data used for this study are derived from the OECD, World Bank, International Monetary Fund and AMECO databases and refer to the time period 1970-2012. The relevant figures are reported in Table 1, where the time horizon under consideration has been divided into decades.[18]

[18] This is actually the time horizon used by Leon-Ledesma (1999) in his application of Thirlwall's Law to the Spanish economy. Note that, according to Eq. (15), the contribution to growth of Δca is negative, since we are considering an improvement in the CA balance. Hence, when discussing policy-makers' growth strategies with respect to Δca the algebraic sign in Table 1 should be reversed.

Tab. 1 - Actual and constrained growth rates in the Euro area

	$\hat{x}$	ε_x	ε_m	$\hat{\tau}$	Δt	Δca	g_b^*	g_e^*	g
1970s	5.94	1.03	1.60	-1.27	-0.22	-1.07	2.92	3.45	3.45
1980s	4.79	0.95	1.92	0.83	-0.26	0.74	2.93	2.41	2.39
1990s	6.85	1.01	3.04	-0.05	-0.44	-0.09	2.23	2.12	2.11
2000s	3.38	0.67	2.74	-0.01	0.03	0.19	1.23	1.17	1.17

As can be seen from Table 1, in all decades the actual and constrained growth rates are very close to each other, which supports the claim that in general the growth process in the EMU countries has been externally constrained.[19] Table 1 also highlights that, from a quantitative point of view, the basic causes of the reduction in the Euro area average growth rate are to be found first, in the increase in the income elasticity of imports and, second, in the reduction of export dynamics. In the 2000s, moreover, EMU exports grow much less than world exports as shown by the sharp decrease in the elasticity to world exports (see columns $\hat{x}$ and ε_x in Table 1). This evidence is compatible with Thirlwall's conclusions that export growth and import dependence dominate in the balance-of-payments constrained-growth model. Policy-makers pursuing growth objectives should therefore carefully monitor and try to improve the values of these crucial variables (i.e., the income elasticity of imports and the export elasticity with respect to world trade). However, Table 1 also shows that the dynamics of the terms of trade may have an important quantitative impact on growth performance. Indeed, in the 1970s, because of their sharp deterioration, mainly as a consequence of the first oil crisis, the average annual growth rate of the whole decade is cut down by 0.8%. In the 1980s, instead, as a consequence of the oil counter-shock of mid-decade, the terms of trade improvement determines a positive growth contribution of 0.4% per year. In the 1990s and in the 2000s, finally, the terms of trade show a substantial average stability so that their impact on the growth process is negligible.

Table 1, furthermore, highlights that g_e^* fits actual growth rates g much better than g_b^*, confirming the appropriateness of including the dynamics of income/unilateral transfers and of the CA balance in a model of externally-constrained growth. In

[19] Note again that we are discussing the Euro area experience starting from 1970 even though the EMU was only set up in 1999. However, the balance-of-payments constrained-growth model, before EMU inception, is applicable to every single member state and hence, by definition, to the whole group of countries.

particular, the biggest differences between g_b^* and g are reported for the 1970s and the 1980s. In the 1970s, the average actual growth rate was higher than the basic constrained one by a half percentage point, while in the 1980s it was lower by the same percentage. This difference is due to the behaviour and the influence of *Δca* and, to a lesser extent, of *Δt*. In particular the net transfer ratio deteriorates since the 1970s, continuing this trend in the 1980s mainly as a consequence of a higher burden of foreign debt service in peripheral countries. The current account ratio dynamics, on the other hand, substantially reflects the policy-makers' attitudes towards the sharp changes undergone by the terms of trade in the two decades. While in the 1970s accommodating policies sustained economic expansion and CA balances were allowed to deteriorate after the first oil shock, in the 1980s non-accommodating policies and the need to reduce imbalances inherited at the beginning of the decade led to a reduction in CA deficits and thus to growth below potential.

The analysis so far has dealt with historical elasticities, which are useful in order to examine the actual experience of EMU countries, even in short periods of time such as decades, and identify the determinants of real GDP growth through the decomposition given by Eq. (15). When moving on to discuss the likely EMU prospects, however, historical elasticities cannot be used, because the condition of unchanged relative prices does not hold in the decades under consideration. In order to obtain more robust elasticities, the rest of the paper will focus on estimating Eurozone import and export demand functions.

5. An econometric analysis for estimating import and export elasticities

The estimated import demand is the following standard one, derived within the framework of imperfect substitution theory:

(16) $m_t = c + \pi y_t + \psi \rho_t^M$

where, in period t, m is the natural log of real imports of goods and services; y is the natural log of real GDP and ρ^M is the import real exchange rate, measured by the ratio between import and domestic prices.[20]

The export demand function is instead:

$$(17) \quad x_t = d + \varepsilon x_t^W + \eta \rho_t^X$$

where, in period t, x is the natural log of real exports of goods and services; x^W is the natural log of world exports and ρ^X is the export real exchange rate obtained from the OECD database.[21]

Before estimating the EMU import and export functions, the existence of a cointegration relationship between the variables in (16) and (17) needs to be verified. To this end, we use the bounds testing procedure developed by Pesaran et al. (see Pesaran et al., 1996; Pesaran and Pesaran, 1997; Pesaran and Shin, 1999; Pesaran et al., 2001), within an autoregressive distributed lag framework (ARDL). This procedure has three main advantages over alternative methods such as the Engle and Granger (1987) and Johansen and Juselius (1990) procedures. First, the bounds test approach is applicable irrespective of whether the underlying regressors are purely I(0), purely I(1) or mutually cointegrated. Second, the unrestricted error correction model (UECM) is likely to have better statistical properties than the two-step Engle-Granger method because, unlike that

[20] In particular, at time t, ρ^M = EMU import deflator / EMU GDP deflator. The estimated coefficient is expected to be negative, since it represents the relative price of imports with respect to domestic prices. Note that while in the literature on Thirlwall's Law, the three relative prices ρ^M (actually its opposite), ρ^X and τ are assumed to be equal to the unique real exchange rate appearing both in the import and export functions and in the definition of the constrained growth rate, this hypothesis holds only in a two-country, two-good Ricardian world. But in a world with many goods and countries characterised by different specialisation models (and stages of development), the three relative prices are different. In particular $p_m \neq p_x^*$ (where p_x^* is competitors' export price) and thus ρ^M (actually its opposite) $\neq \rho^X$, mainly because of the presence of raw materials in imports. Similarly $\tau \neq \rho^M$ (again its opposite) because $p \neq p_x$ (where p is the GDP deflator). Empirically, in the period 1970-2012 considered in the paper, the terms of trade have worsened at an average annual rate of 0.2%, ρ^X has depreciated at an average yearly rate of 0.7% and ρ^M has decreased at an average annual rate of 0.9%, so that its opposite has actually increased at the same rate. Since EMU inception, the corresponding figures are -0.4%, -0.3% and 0.1%.

method, the UECM does not push the short-run dynamics of the dependent variable into the residual terms (Banerjee et al., 1993, 1998). Third, it can be applied to cases having a small sample size while the alternative methods of cointegration are not reliable in those circumstances, such as in the present study. The bounds testing procedure has already been applied with proficiency to relatively small sample size studies of import and export demand (see, inter alia, Narayan and Narayan, 2004 and Narayan and Narayan, 2005). We therefore follow the three-step procedure outlined in these works as detailed in Sections 5.1, 5.2 and 5.3, dedicated to imports. The same procedure is also applied to the estimation of the export function, but substituting the variables x_t, x_t^W, ρ_t^X to the correspondent variables m_t, y_t, ρ_t^M in Equations (18) to (22).

5.1. Establishing the existence of a long-run relationship

In order to establish the existence of one or more long-run relationships, the following models are estimated:

(18)

$$\Delta m_t = \alpha_{0m} + \sum_{i=1}^{n} \beta_{im} \Delta m_{t-i} + \sum_{i=0}^{n} c_{im} \Delta y_{t-i} + \sum_{i=0}^{n} d_{im} \Delta \rho_{t-1}^{M} + \lambda_{1m} m_{t-1} + \lambda_{2m} y_{t-1} + \lambda_{3m} \rho_{t-1}^{M} + u_{1t}$$

(19)

$$\Delta y_t = \alpha_{0y} + \sum_{i=1}^{n} \beta_{iy} \Delta y_{t-i} + \sum_{i=0}^{n} c_{iy} \Delta m_{t-i} + \sum_{i=0}^{n} d_{iy} \Delta \rho_{t-1}^{M} + \lambda_{1y} y_{t-1} + \lambda_{2y} m_{t-1} + \lambda_{3y} \rho_{t-1}^{M} + u_{2t}$$

(20) $$\Delta \rho_t^{M} = \alpha_{0\rho} + \sum_{i=1}^{n} \beta_{i\rho} \Delta \rho_{t-1}^{M} + \sum_{i=0}^{n} c_{i\rho} \Delta y_{t-i} + \sum_{i=0}^{n} d_{i\rho} \Delta m_{t-i} + \lambda_{1\rho} \rho_{t-1}^{M} + \lambda_{2\rho} m_{t-1} + \lambda_{3\rho} y_{t-1} + u_{3t}$$

When a long-run relationship exists, the F-test indicates which variable should be normalised. The null hypothesis of no cointegration between the variables in Eq. (18) is (H0: $\lambda_{1m}= \lambda_{2m}= \lambda_{3m}= 0$) denoted by $F_m(m|y, \rho^M)$ against the alternative (H1: $\lambda_{1m}\neq\lambda_{2m}\neq\lambda_{3m}\neq 0$). Similarly, the F-tests for checking the null hypothesis of non-existence of a long-run relationship in Eqs. (19) and (20) are denoted by $F_y(y|m, \rho^M)$ and F_{ρ^M}

[21] The export real exchange rate is measured by the competitiveness-weighted relative unit labour costs in EMU versus foreign competitors.

(ρ^M |y, m). The F-test has a non-standard distribution which depends on: (i) whether variables included in the ARDL model are I(0) or I(1); (ii) the number of regressors; (iii) whether the ARDL model contains an intercept and/or a trend. We use the critical values for the test proposed by Narayan (2005), since they are more appropriate for small sample sizes than those reported in the seminal paper by Pesaran and Pesaran (1997). If the computed F-statistics fall outside the critical bounds, a conclusive inference can be made about cointegration. For instance, if the empirical analysis shows that the estimated F is higher than the upper bound of the critical values, the null hypothesis of no cointegration is rejected.

5.2 Estimating long-run elasticities

Once the existence of a long-run relationship is verified, long-run elasticities are estimated by ordinary least squares techniques.

The following ARDL model is estimated for the import demand:

$$(21)\quad m_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 m_{t-i} + \sum_{i=0}^{p} \alpha_2 y_{t-i} + \sum_{i=0}^{q} \alpha_3 \rho_{t-1}^{M} + ECT_t^{M}$$

The orders of the lags in the model are selected using the Schwartz Bayesian Criterion (SBC).

5.3 Estimating short-run elasticities and the speed of adjustment

Short-run elasticities and the speed of adjustment are estimated using the following Error Correction model for imports:

$$(22)\quad \Delta m_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta m_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta y_{t-i} + \sum_{i=0}^{n} \beta_3 \Delta \rho_{t-i}^{M} + \beta_4 ECT_{t-i}^{M} + \mu_t$$

where ECT_{t-1}^{M} is the one-period lagged error correction term estimated in Equation (21). The coefficient of the error correction term is expected to have a negative sign, since it measures the speed of adjustment to return to equilibrium in the event of shock(s) to the system.

6. Empirical results from the estimation of import and export elasticities

We start by testing the presence of a long-run relationship between the variables of interest as explained in Section 5. The results reported in Table 2 show that the computed F-statistics $F_m(m|y, \rho^M)$ and $F_x(x|x^w, \rho^X)$ exceed the critical values identified by Narayan (2005) at the 99% and 90% confidence level respectively.[22]

Tab. 2 –Cointegration tests

Critical value bounds of the F-statistic: intercept and no trend						
k	90% level		95% level		99% level	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
2	2.788	3.540	3.368	4.203	4.800	5.725
Calculated F-statistic						
Import demand			Export demand			
$F_m(m\|y, \rho^M)$	19.84		$F_x(x\|x^W, \rho^X)$		3.55	
$F_y(y\|m, \rho^M)$	13.93		$F_{x^w}(x^W\|w, \rho^X)$		3.20	
$F_{\rho^M}(\rho^M\|y,m)$	1.78		$F_{\rho^x}(\rho^X\|x, x^W)$		2.04	

Note: Critical values are extracted from Narayan (2005)

Since a cointegration relationship is verified for the variables in Eqs. (16) and (17), we can estimate the import and export demand models as indicated in Eq. (21). In particular, an ARDL (1, 0, 0) specification is used for the import function, while the export function is better specified by an ARDL (1, 1, 0).

Tab. 3 – Long-run coefficients of import and export demand

Regressors	Coefficients
Import demand - Dependent variable m_t	
y_t	1.85 ***
ρ_t^M	-0.60 **
Export demand - Dependent variable x_t	
x_t^W	0.87 ***
ρ_t^X	-0.40 ***

Note: ** (***) denotes statistical significance at the 5% (1%) level.

Table 3 reports the long-run coefficients computed. They are all statistically significant and have the expected sign. In particular, EMU imports show a significant strong

[22] We consider critical values for I(1) variables since unit root tests indicate that all the variables have a unit root. Estimations are available on request.

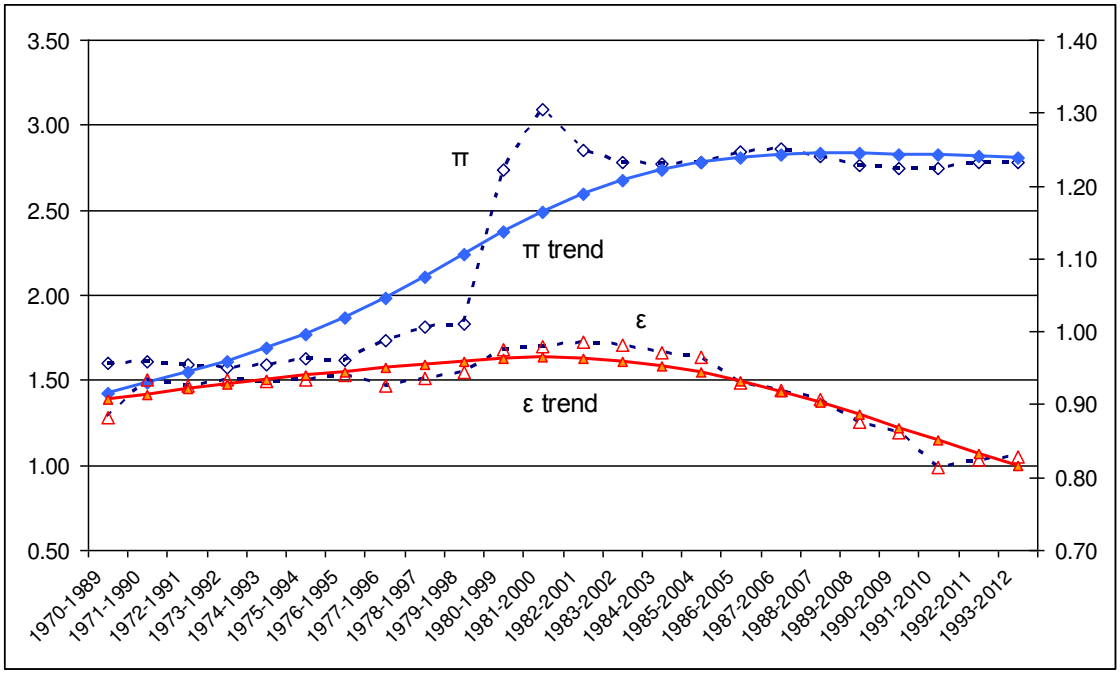
dependence on domestic GDP, and decrease when relative import prices rise.[23] EMU exports, on the other hand, are highly positively correlated with world exports and negatively influenced by an increase in relative export prices.

Our main interest, however, is in the evolution of elasticities, and in particular of the key scale elasticities of Thirlwall's model, over time. In particular, we want to verify whether the income elasticity of imports has increased and whether the export elasticity to world exports has remained constant or decreased over time. To this end, we run rolling period regressions using a 20-year overlapping period. This analysis yields the result that the import elasticity to domestic GDP increases significantly over time, while the export scale elasticity decreases after a first period of substantial stability. These outcomes are shown in Figure 2, which plots the estimated elasticities for each rolling window (series π for imports and ε for exports respectively) as well as their underlying trends calculated using a Hodrick-Prescott filter. Figure 2 also suggests the presence of one or more time breaks in the import function. We therefore ran a Chow test which confirmed the presence of a structural break at the split years 1988 and 1989.[24] For this reason, new rolling period regressions for the import function considering a shorter window of T=17 were run, in order to obtain evolving coefficients for the income elasticity of imports excluding the years of the structural break. The new estimates confirm the previous results, since the values of π for the time spans 1970-1986 and 1971-1987 are 1.55 and 1.56 respectively, while in the last time span 1996-2012 the value of π rises to 2.66. The supplementary rolling regressions thus confirm the evidence of a strong increase in the income elasticity of imports for the Euro area over the 42-year period considered, which was already indicated by the trend of historical elasticities shown in Table 1.

[23] It is worth recalling that the import real exchange rate ρ^M is defined as the ratio between import and domestic prices.

[24] A plausible explanation for this time break is the 1987 regime change from floating to de facto fixed exchange rates in the European Monetary System – Exchange Rate Mechanism (EMS-ERM) in order to accelerate convergence of EMU candidates.

Fig. 2 – Rolling period estimations for the income elasticity of imports (π) (left axis) and the export elasticity to world exports (ε) (right axis), coefficients and trends obtained by Hodrick-Prescott filtering



Note: The π data and their trend are measured on the left axis while the ε data and their trend on the right axis

As a final exercise we estimate the short run elasticities of our functions and the speed of adjustment to equilibrium by using an error correction model as outlined in Section 5.3. Table 4 shows the results.[25] Both EC terms (ECT^{M}_{t-1} for imports and ECT^{X}_{t-1} for exports) are negative and statistically significant, assuring that the series are non-explosive and tend to a long-run equilibrium. The convergence to equilibrium, as indicated by the magnitude of the coefficients, is similar for imports and exports.

To summarise, the main results of our estimates are not favourable to EMU perspectives: the export elasticity with respect to trade volumes shows a decreasing trend that starts from the rolling period 1983-2001. Since this elasticity reflects non-price competitiveness (quality, design, technological content, reliability, varieties, destination markets, etc.), it captures a general loss in competitiveness which can be probably attributed to trade with sluggish destination markets, a specialisation in non-dynamic and low-tech product categories and possibly a decline in the qualitative

[25] Diagnostic tests for autocorrelation, normality and heteroskedasticity of residuals were applied and confirmed the reliability of all models estimated in this section. Results are available on request.

features of EMU exports. For imports, on the other hand, the income elasticity shows a continuous increase over time with a stabilisation around the value of 2.8.

Tab. 4 – Short-run elasticities from the estimated error correction models for import and export demand

Regressors	Coefficients	(t-statistics)
Dependent variable Δm_t		
Constant	0.001	0.25
Δm_{t-1}	0.691 ***	6.52
Δy_t	2.427 ***	18.69
Δy_{t-1}	-1.680 ***	-7.04
$\Delta \rho_t^M$	-0.004	0.12
ECT_{t-1}^M	-0.423 ***	-4.15
Dependent variable Δx_t		
Constant	-0.019 ***	-3.91
Δx_{t-1}	0.318 **	2.16
Δx_{t-2}	0.090 *	1.91
Δx_t^W	1.097 ***	25.84
Δx_{t-1}^W	-0.225	-1.48
$\Delta \rho_{t-1}^X$	-0.195 ***	-5.4
ECT_{t-1}^X	-0.471 **	-2.02

Note: * [**] (***) denotes statistical significance at the 10% [5%] (1%) level.

So, using the parameters derived from our most recent rolling period estimations, and assuming that world exports continue to expand at the pace of the last five years (2.7%), the basic model yields a forecast of a constrained growth rate for the Eurozone of a bleak 0.8%. If, however, world exports dynamics increased at the same pace as the last decade (5.4%), the growth prospects for EMU would be around 1.6%. Our extended model, on the other hand, yields an increase in the constrained growth rate of about 0.2% (0.4%) per year if the 2012 CA surplus of about 2% of GDP were gradually eliminated in ten (five) years. An additional, even though marginal, contribution to growth might come from the likely improvement of the net income and unilateral transfers balance, mainly generated by the recent cut in interest rates, which positively affects interest payments on foreign debt, especially in peripheral countries.[26]

7. Discussion and conclusions

Recent growth performance in the Euro area, and in the whole EU, has been somewhat disappointing. The US, instead, has seen better results: after the deep recession of 2008-09, recovery has gradually taken place, and the growth gap with Europe has widened. Of course this difference in performance can be partly explained by the diverse policy stance: in the USA monetary and fiscal policies have been quite expansionary to support aggregate demand, while in Europe the Stability and Growth Pact and the austerity measures imposed by the sovereign debt crisis, have inhibited the use of a reflationary policy on the budgetary side. However, although it is largely unrecognised, the main factor behind the poor growth performance in Europe in the last decade actually lies in the weak dynamics of exports, accompanied by an increased income elasticity of imports. In a longer term perspective, it should be noted that lower growth in Europe is not a new feature of the current century; it also characterised the 1980s and 1980s. In the 1990s, in particular, EMU average growth rate was only about two thirds of the American level.

Mainstream economics, in explaining the factors underpinning economic growth and cross-country differences, stresses the importance of supply-side phenomena such as the rate of change of the labour force and the pace of technological progress. In line with this point of view some scholars emphasise the role of the 'new economy' in the better growth performance of the United States in the 1990s. This explanation, however, is not entirely convincing: the new economy has not been long-lasting, and the differences in supply factor behaviour do not seem strong enough to explain the persistent gap in growth rates. A more promising line of explanation appears to lie in a Post-Keynesian approach: growth is fundamentally demand-determined and ultimately triggered by the dynamics of the exogenous components of aggregate demand and especially exports. In a long-run perspective, external demand is the only truly exogenous variable, especially in a world where orthodox finance principles require the public budget to be balanced. In particular, adopting a Kaldorian approach, it may be claimed that real growth is balance-of-payments constrained, so that the maximum

[26] It should be noted, however, that the current EMU CA surplus is entirely due to the recent recession, which depressed the volume of imports. Indeed if EMU output were at its potential level, the present EMU surplus would become a structural deficit of around 1% of GDP.

achievable growth rate mainly depends on the dynamics of exports, the behaviour of the terms of trade and the level of the import elasticity with respect to income. Other minor but significant quantitative contributions to the growth process derive from net income and unilateral transfers behaviour and from policy-makers' targets about the current account dynamics.

The application of the balance-of-payments constrained-growth model to the Euro area experience shows that its predictions conform fairly well to the actual performance. This implies that the true causes of the low growth rate in the Eurozone are ultimately to be found in an unsatisfactory export dynamics and in a high and time-increasing level of the income elasticity of imports. The terms of trade dynamics played an opposite role in the 1970s and in the 1980s, with no substantial influence afterwards. Finally, the policy-makers' attitude towards CA imbalances contributed positively to growth in the 1970s and negatively in the 1980s. In these same decades, the change in the CA ratio and - even if to a lesser extent - the deterioration in net transfers, together accounting for a half percentage point on the average yearly GDP growth rate, demonstrate the appropriateness of including these additional variables in an extended model of balance-of-payments constrained growth.

As far as exports are concerned, EMU goods have recently shown difficulty in keeping pace with a world trade which is shifting its propulsion centre towards the Pacific area and is increasingly relying on non-price competition and qualitative features to achieve success on international markets. Eurozone exports as a whole are characterised by an elasticity to world trade which is less than one and time-decreasing. This supports the view that they hold a weak position in international specialisation. With regard to imports, their high and growing income elasticity might be a symptom of a structural weakness of the Euro area productive systems unable to satisfy the requirements of capital accumulation.

So in sum, the unsatisfactory export dynamics and especially the high and increasing income elasticity of imports, can be traced to the structural features of EMU economies, perhaps inadequate to the needs of a rapidly changing world. The key to successful growth performance thus appears to lie in the capacity to change the productive structure and adapt it to the required international standards. The conclusion would therefore be that structural reforms in EMU are indeed necessary for faster

growth; but not of the kind mainstream orthodoxy proposes. Truly effective reforms, especially in peripheral countries, need to address export promotion and import substitution; hence their focus should not be on the pension system, labour market flexibility or public finance control but rather on innovation and industrial policy.

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