ECONOMIC GROWTH AND THE BALANCE-OF-PAYMENTS CONSTRAINT: THE CASE OF THE SPANISH REGIONS, 1988–2009[*]

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The balance-of-payments can act as a constraint on the rate of output growth, on putting a limit to the growth in the level of demand to which supply can adapt. Regional economies might be particularly sensitive to this effect, since they are presumably more integrated among them. In this paper, we examine this issue for the case of the 17 Spanish regions over the period 1988–2009, and calculate their balance-of-payments-constrained growth rates. By comparing these balance-of-payments-constrained growth rates with the actual growth rates, we would be able to assess whether the balance-of-payments has worked as a constraint on growth.

Keywords: economic growth, external deficit, regions, Spain

JEL classification indices: F41, F43, O40

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1. INTRODUCTION

Following integration into the European Union (EU) in 1986, the Spanish econo-
my enjoyed a period of enduring growth and structural transformations, which al-
lowed it to make a significant progress regarding convergence towards the more
advanced countries. This process was also accompanied by an increased external
openness, starting from a relatively more closed economy as compared to the rest
of the EU members. The uneven evolution of exports and imports, however, was
translated into a continuous and increasing trade deficit that reached record fig-
ures on the eve of the current crisis. *Table 1* presents some information on these
developments: the average values for several time periods of the rate of GDP
growth, the values of exports, imports, and the trade balance in real terms, the rate
of coverage of imports by exports, and the rate of openness.

Table 1. Growth and foreign trade in Spain, 1986–2009

	Growth rate of GDP (%)	Exports (billion euros)	Imports (billion euros)	Trade balance (billion euros)	Rate of coverage (%)	Rate of openness (%)
1986–1989	4.7	358.22	489.35	−131.14	68.6	29.0
1990–1993	1.4	495.45	758.22	−262.77	67.0	29.0
1994–1997	2.7	820.79	1,040.59	−219.80	82.0	38.6
1998–2001	4.0	1,172.97	1,599.94	−426.97	76.2	47.9
2002–2005	3.0	1,431.66	2,054.54	−622.89	71.9	46.8
2006–2009	1.4	1,602.07	2,465.34	−863.27	67.0	49.6
1986–2009	2.9	980.19	1,401.33	−421.14	72.1	40.2

Notes: Exports, imports and trade balance data are in constant prices of 2000. Rate of coverage: the ratio of
exports to imports; rate of openness: the ratio of the sum of exports and imports to GDP.

Sources: Spanish Ministry of Economy and Competitiveness; de la Fuente (2010).

Trade deficit has been a chronic feature of the Spanish economy. During the
high growth period of the 1960s, this led to the appearance of "stop-and-go" situ-
ations: when the economy grew too fast, the balance-of-payments deteriorated,
putting pressure on the exchange rate, therefore foreign reserves fell, and a period
of slower growth followed in order to correct the external disequilibrium. Ac-
cording to some authors, growth was thus subordinated to the evolution of the
trade balance (e.g. Segura – García-Viñuela 1978).

A customary way of analysing the stop-go cycles follows Thirlwall's approach
by calculating the balance-of-payments-constrained growth rate as the rate of
growth of exports divided by the income elasticity of the demand for imports

(Thirlwall 1979 and Thirlwall – Hussain 1982). By comparing this a growth rate with the one prevailing in a particular country, it is possible to assess whether the balance-of-payments works as a constraint on economic growth in the analysed country. This method, on the other hand, is equivalent to a result derived by Krugman (1989), who found that countries growing faster face higher income elasticity for their exports than for their imports. The rationale behind this approach is that no country can grow faster than its balance-of-payments-constrained growth rate for a very long time, since its ratio of external debt to GDP will reach unsustainable levels, leading to a collapse in international confidence and to an external debt and currency crisis. Only when the actual growth rate is lower than the balance-of-payments-constrained one would a country be able to experience a sustained growth.

Regional economies within a given nation-state might be particularly sensitive to this effect, since they are presumably more integrated among them. In particular, regions within countries have a larger trade sector, a common currency with the other regions, and a freer mobility of factors of production. Therefore, according to Thirlwall (1980: 420) "regional problems of slow growth and high unemployment are, in essence, balance-of-payments problems stemming from a weak trade sector". The effect of the balance-of-payments is different in regional economies than in monetary unions. Regions within countries or states of a monetary union have a common currency, which prevents external devaluation. At the regional level, in a state or in a country, the common fiscal policy and the fully free mobility of factors act as adjustment mechanisms when facing regional (asymmetric) imbalances. More specifically, in the case of the Spanish regions, we could say that they constitute an optimal currency area.

In addition to the significant increase in external openness and integration into the world economy mentioned above, Spain also developed a continuous process of political decentralisation since the restoration of democracy at the end of the 1970s. Thus, starting from a highly centralised political system, Spain developed towards what, in many respects, can be considered a federal state.[1] This fact, together with the availability of sufficiently long series on regional foreign trade, can make Spain a good candidate for exploring the links between growth and foreign trade from a regional perspective. *Table 2* presents the same information as in *Table 1* regarding the 17 Spanish regions. As can be seen, regional data show significant differences in openness and performance in foreign markets, which are hidden when examining nation-wide figures.

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[1]   The evolution of government borrowing at the regional level in Spain is discussed by Toboso (2014).

Table 2. Growth and foreign trade in Spanish regions, 1988–2009

Regions	Growth rate of GDP (%)	Exports (billion euros)	Imports (billion euros)	Trade balance (billion euros)	Rate of coverage (%)	Rate of openness (%)
Andalucía	2.6	91.36	111.34	−19.98	82.1	27.4
Aragón	2.2	49.97	47.07	2.90	106.2	55.5
Asturias	1.6	16.60	19.73	−3.12	84.2	29.0
Baleares	2.3	7.44	13.40	−5.96	55.5	15.1
Canarias	2.4	128.73	116.77	11.97	110.3	45.9
Cantabria	2.3	7.86	34.31	−26.45	22.9	19.1
Castilla y León	2.1	11.84	13.75	−1.91	86.1	37.2
Castilla-La Mancha	2.5	16.62	30.73	−14.11	54.1	25.0
Cataluña	2.3	61.15	62.90	−1.74	97.2	39.9
Comunidad Valenciana	2.4	274.67	430.55	−155.88	63.8	67.2
Extremadura	2.6	6.46	4.34	2.11	148.7	11.5
Galicia	2.2	71.38	79.01	−7.64	90.3	51.6
Madrid	2.8	110.32	346.62	−236.31	31.8	47.3
Murcia	2.9	26.89	37.56	−10.67	71.6	48.2
Navarra	2.6	36.50	30.27	6.23	120.6	70.2
País Vasco	2.3	98.83	94.19	4.64	104.9	55.6
Rioja	2.4	6.71	5.50	1.21	122.0	29.0
Spain	2.4	1,039.19	1,491.83	−452.64	69.7	45.7

Sources: Spanish Ministry of Economy and Competitiveness; de la Fuente (2010).

In this paper, we will follow Thirlwall's (1980) suggestion and investigate the role of the external or "foreign" sector as a potential restrictive factor on economic growth. The underlying theoretical framework is discussed in Section 2, and the empirical results are presented in Section 3, while Section 4 concludes.

2. THEORETICAL FRAMEWORK

Assume that the demands for exports and imports are described by the standard functions (Goldstein – Khan 1985):

$$X = X\left(Y^{*}, Q\right) \qquad \frac{\partial X}{\partial Y^{*}} > 0, \frac{\partial X}{\partial Q} < 0$$

$$M = M\left(Y, Q\right) \qquad \frac{\partial M}{\partial Y} > 0, \frac{\partial M}{\partial Q} > 0$$

where X and M stand for exports and imports volumes, and Y^* and Y for foreign and domestic real output, respectively; Q is the real exchange rate, measured as the price of domestic goods relative to foreign goods. The model is completed with the equation for the trade balance:

$$B = X - \frac{M}{Q}$$

where B denotes the trade balance in domestic currency, in real terms.

Keeping unchanged the trade balance requires:

$$\frac{dB}{dt} = X\left(\varepsilon_{X,Y^*}\hat{Y}^* - \varepsilon_{X,Q}\hat{Q}\right) - \frac{M}{Q}\left(\varepsilon_{M,Y}\hat{Y} + \varepsilon_{M,Q}\hat{Q} - \hat{Q}\right) = 0$$

where ε_{X,Y^*}, $\varepsilon_{M,Y}$, $\varepsilon_{X,Q}$, and $\varepsilon_{M,Q}$ are the (absolute values of the) income and price elasticities of exports and imports, respectively; and the symbol ^ over a variable denotes its growth rate. Assuming that initially $B = 0$, so that $X = \frac{M}{Q}$, in order to have the trade balance in equilibrium we must have:

$$\varepsilon_{X,Y^*}\hat{Y}^* - \varepsilon_{M,Y}\hat{Y} - \left(\varepsilon_{X,Q} + \varepsilon_{M,Q} - 1\right)\hat{Q} = 0.$$

As can be seen from the above equation, a country growing relatively faster $(\hat{Y} > \hat{Y}^*)$ should have, other things equal, a depreciating real exchange rate (provided that the Marshall–Lerner condition holds). However, as shown by Krugman (1989), under imperfect competition countries showing higher growth rates will increase their shares of world markets, not by reducing the relative prices of the goods they produce, but by raising instead the number of product varieties. Accordingly, such countries will enjoy more favourable income elasticities (i.e., a higher ε_{X,Y^*} and a lower $\varepsilon_{M,Y}$) and would be able to experience relatively higher growth rates without the need of real exchange rate depreciation in the long run. In other words, in the long run real exchange rates would not change, so their growth rate would be zero.

Hence, if there is no long-run trend in the real exchange rate, $\hat{Q} = 0$, we would have the following condition:

$$\frac{\varepsilon_{X,Y^*}}{\varepsilon_{M,Y}} = \frac{\hat{Y}}{\hat{Y}^*},$$

i.e., a country growing relatively faster should have relatively higher income elasticity for exports than for imports; this is Krugman's (1989) "45-degree rule". From here, we can get a related result, by finding the balance-of-payments-constrained growth rate, $\hat{Y}_B$, i.e., the maximum growth rate a country can achieve

while keeping in equilibrium the trade balance, and provided that the real exchange rate remains unchanged:

$$\hat{Y}_B = \frac{\varepsilon_{X,Y^*}}{\varepsilon_{M,Y}} \hat{Y}^*.$$

This rule, derived by Thirlwall (1979), is the dynamic analogue of the Harrod trade multiplier (1933), and implies that a country growing above $\hat{Y}_B$ will run an external deficit, which would harm its future growth prospects; conversely, a country growing below $\hat{Y}_B$ will run an external surplus.

3. EMPIRICAL RESULTS

The above theoretical framework has been applied to data on real GDP, exports, and imports, for the 17 Spanish regions *(comunidades autónomas)* established after the approval of the present Constitution in 1978. World output has been proxied by the GDP of the OECD countries. The data are annual, and the sample period runs from 1988 (the first year for which regional data on foreign trade are available) to 2009 (the last year for which data on regional GDP are available). The data sources are the State Secretariat for Trade (Ministry of Economy and Competitiveness) for exports and imports; OECD Statistics for the OECD's GDP; and de la Fuente (2010) for the Spanish regions' GDP.

In *Table 3,* we show the long-run income elasticities of the demands for exports and imports, together with the R^2 of each estimated equation, where the elasticities have been estimated using the method of Phillips – Hansen (1990). This method is intended to eliminate the potential biases that might appear in small samples when estimating under ordinary least squares, by computing a class of Wald tests, modified by semiparametric corrections for serial correlation and endogeneity bias. Note, that the figures in parentheses below each coefficient are the Phillips and Hansen's fully-modified Wald test statistics on the null hypothesis that the estimated coefficients are equal to zero, asymptotically distributed as a χ^2 with one degree of freedom.

In columns 1 and 2 of *Table 4,* we present, respectively, the average values of the actual growth rates of the GDP of each of the regions between 1988 and 2009, and the ratios of each of the latter to the average value of the growth rate of the OECD's GDP over the same period, i.e. 2.182. The ratio of the income elasticities for exports and imports previously estimated (see *Table 3*) is shown in the third column. Finally, the balance-of-payments-constrained growth rates appear in the last column.

First, when comparing columns 2 and 3 in *Table 4,* we can see that those regions facing a higher income elasticity of exports relative to that of imports would be allowed to grow faster than the average of the OECD. The figures

Table 3. Estimated export and import elasticities in Spanish regions, 1988–2009

	ε_{X,Y^*}	R^2	$\varepsilon_{M,Y}$	R^2
Andalucía	2.763 (402.7)	0.973	2.778 (314.5)	0.969
Aragón	2.474 (79.12)	0.887	2.959 (33.06)	0.782
Asturias	2.595 (267.2)	0.958	4.200 (206.0)	0.943
Baleares	4.311 (49.12)	0.832	2.348 (48.22)	0.784
Canarias	2.668 (48.40)	0.818	1.080 (112.2)	0.897
Cantabria	3.200 (164.5)	0.948	2.496 (41.37)	0.780
Castilla y León	3.256 (51.65)	0.844	2.743 (23.93)	0.717
Castilla-La Mancha	3.665 (185.6)	0.951	4.312 (105.3)	0.922
Cataluña	3.397 (123.5)	0.932	2.710 (316.5)	0.965
Comunidad Valenciana	2.133 (77.35)	0.888	2.806 (126.1)	0.934
Extremadura	4.178 (91.23)	0.906	4.123 (148.0)	0.939
Galicia	4.554 (552.1)	0.982	3.764 (173.6)	0.945
Madrid	3.598 (113.9)	0.930	2.272 (190.8)	0.941
Murcia	3.036 (131.2)	0.939	3.887 (636.0)	0.978
Navarra	2.791 (65.34)	0.863	2.528 (61.46)	0.821
País Vasco	2.855 (311.9)	0.969	2.485 (590.1)	0.970
Rioja	3.665 (51.89)	0.857	2.647 (52.87)	0.859
Spain	3.062 (166.1)	0.949	2.663 (231.3)	0.955

Notes: All the estimated elasticities are significant at the 1% level. The critical value for the Wald tests (distributed as a $\chi 2$ with one degree of freedom) at the 1% level is 6.63.

Sources: Spanish Ministry of Economy and Competitiveness; de la Fuente (2010); OECD; own elaboration.

Table 4. Actual and balance-of-payments-constrained growth rates in Spanish regions, 1988–2009

	1	2	3	4
	$\hat{Y}$	$(\hat{Y}/\hat{Y}^*)$	$\varepsilon_{X,Y^*}/\varepsilon_{M,Y}$	$\hat{Y}_B$
Andalucía	2.621	1.201	0.995	2.170
Aragón	2.181	0.999	0.836	1.824
Asturias	1.601	0.734	0.618	1.348
Baleares	2.267	1.039	1.836	4.006
Canarias	2.417	1.108	2.470	5.390
Cantabria	2.291	1.050	1.282	2.797
Castilla y León	2.084	0.955	1.187	2.590
Castilla-La Mancha	2.472	1.133	0.850	1.855
Cataluña	2.326	1.066	1.254	2.735
Comunidad Valenciana	2.406	1.103	0.760	1.659
Extremadura	2.594	1.189	1.013	2.211
Galicia	2.176	0.997	1.210	2.640
Madrid	2.761	1.265	1.584	3.456
Murcia	2.908	1.333	0.781	1.704
Navarra	2.608	1.195	1.104	2.409
País Vasco	2.298	1.053	1.149	2.507
Rioja	2.424	1.111	1.385	3.021
Spain	2.435	1.116	1.150	2.509

Sources: Spanish Ministry of Economy and Competitiveness; de la Fuente (2010); OECD; own elaboration.

for each region are plotted in *Figure 1,* together with the 45-degree line; this is Krugman's "45-degree rule". As can be seen, the two insular regions, i.e. the Balearic and Canary Islands, stand as outliers, with the highest elasticities ratios, but showing a growth performance not particularly above the OECD's (and even below the Spanish average in the case of the Balearics). This effect is particularly strong for the Canaries, which show the lowest import elasticity by far, meaning a high rigidity of imports in a region located more than 1,000 kilometres away from mainland Spain. The positive relationship between both variables emerges clearer for the peninsular regions, although the variability of the elasticities ratios appears higher than that of the relative growth rates.

Now we turn to compare the actual growth rate and Thirlwall's balance-of-payments-constrained growth rate from columns 1 and 4 in *Table 4,* shown in *Figure 2* together with the 45-degree line. Spain as a whole would have grown along the period at roughly her balance-of-payments-constrained growth rate, so that the foreign sector would not have worked as a constraint on the growth of the Spanish economy. However, this result, which would agree with that found by Bajo-Rubio (2012) for the longer period of 1850–2000, hides some differences at
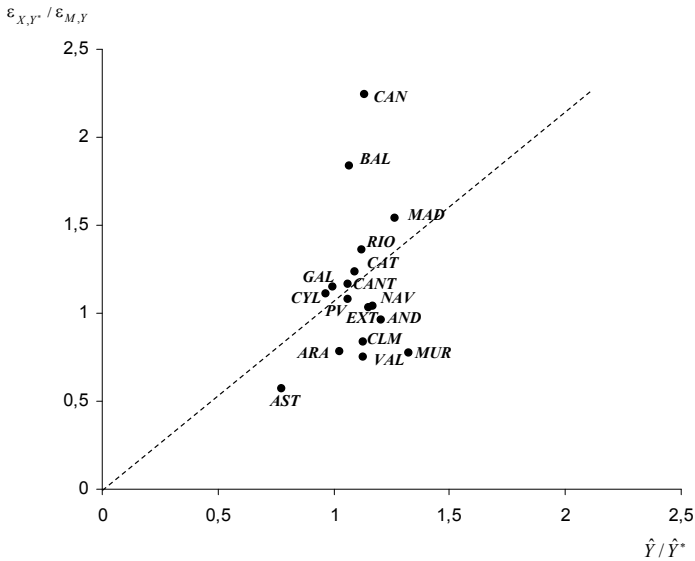
Figure 1. Actual growth rates relative to OECD, and ratio of income elasticities
for export and import in Spanish regions, 1988–2009

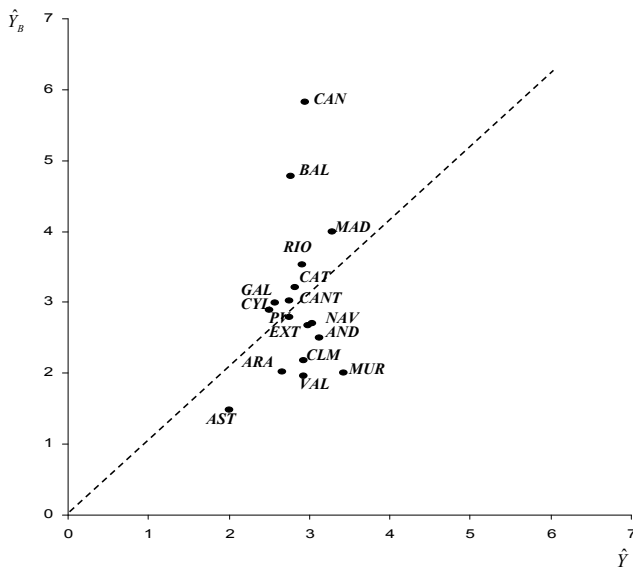*Note:* We use the first 3 letters for the regions.

Figure 2. Actual and balance-of-payments-constrained growth rates in Spanish regions,
1988–2009

Note: We use the first 3 letters for the regions.

a regional level. Note that we are comparing the realised growth rate for our sample period with the maximum growth rate, while keeping in equilibrium the trade balance over the long run, i.e. in an intertemporal perspective. The underlying assumptions are not only an unchanged real exchange rate, but also a sustainable long-run economic growth compatible with trade imbalances in the short-run.

On the one hand, the rates of growth for 9 regions appear below their balance-of-payments-constrained rates. This is the case of Canarias, Baleares, Madrid, Rioja, Cantabria, Castilla y León, Galicia, Cataluña, and País Vasco. The difference between both rates is the most remarkable for the two insular economies: 3 points for the Canaries, and 1.74 for the Balearics. Accordingly, this set of regions would show no competitiveness problems, and might even have grown at a higher pace, given their foreign trade performance.

On the other hand, the rates of growth of the other 8 regions would appear above their balance-of-payments-constrained counterparts, revealing the presence of some competitiveness problems. This is the case of Murcia, Comunidad Valenciana, Castilla-La Mancha, Andalucía, Extremadura, Aragón, Asturias, and Navarra. The two stronger cases are those of Murcia and Comunidad Valenciana, for which the difference amounted to 1.2 and 0.75 points, respectively. Most of these regions are characterised by low levels of productivity, well below the Spanish average (Reig et al. 2007; Cuadrado-Roura 2010). These would be the cases of Murcia, Comunidad Valenciana, Castilla-La Mancha, Andalucía, and Extremadura, where the construction sector also has had a strong weight (especially in the Mediterranean coastal regions). Note also that this group includes Asturias, the Spanish region showing the lowest growth rate, around 3/4 of the OECD's growth rate over the period. Finally, the cases of Aragón and Navarra (two regions with productivity levels above the Spanish average) might be explained by their unfavourable trade elasticities, in particular the very high income elasticity of their imports.

4. CONCLUDING REMARKS

The Spanish economy experienced a remarkable growth since the integration with the EU in 1986. However, due to the uneven evolution of exports and imports, the associated process of increased external openness led to a continuous and increasing trade deficit that reached record figures on the eve of the current crisis. In addition, given the relatively lower level of development of the Spanish economy, it tended to grow faster than the EU average to which she tried to converge. Accordingly, the trade deficit might appear to be a constraint on extra output growth.

We analysed the extent to which an increase in growth might lead to unsustainable external positions at a regional level. Our case study has been the 17 Spanish regions over the period 1988–2009. The process of political decentralisation, since the restoration of democracy at the end of the 1970s, together with the availability of sufficiently long series on regional foreign trade, make Spain a good candidate to explore the links between growth and foreign trade from a regional perspective. Following the approach proposed by Thirlwall (1979, 1980), we have calculated the balance-of-payments-constrained growth rate for each region, which has allowed us to assess whether the balance-of-payments worked as a constraint on economic growth in the analysed regions. The value of that particular growth rate determines a limit for future growth, since a region growing above it will run an external deficit.

As expected, regional data show significant differences across regions, in terms of the degree of openness and performance in the foreign markets, hidden when examining nation-wide figures. The results have shown that Spain, as a whole, grew at roughly her balance-of-payments-constrained growth rate during the period, so that the foreign sector does not seem to have worked as a constraint on the growth of the Spanish economy. Although the Spanish economy showed no external balance on a yearly basis, foreign deficit would have been sustainable over the long run, allowing for a steady economic growth. However, when looking at the regional level, we could differentiate between two types of regions.

Recall that, as mentioned before, we could say that the Spanish regions make up an optimal currency area, thus the effects of the current economic and financial crisis could have been mitigated through national fiscal policy and the mobility of factors within the country. On the other hand, since the Spanish State is a monetary union, it could also be argued that regional external imbalances would be irrelevant: deficits in some regions would be offset to a certain extent by surpluses in other regions, so the external constraint on economic growth would only operate at a country level. However, high external imbalances in a particular region could be a sign of an unbalanced growth pattern and a loss of competitiveness, which would be reflected in a higher inflation *vis-à-vis* the rest of the union, requiring a lower growth of domestic prices that would negatively affect the growth prospects of that region. Hence, in a monetary union, the external constraint would be still binding.[2]

Accordingly, we found that only 9 regions did not seem to show competitiveness problems since their rates of growth appear below their balance-of-payments-constrained rates. As regards the 8 other regions, most of them are

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[2]   See Catte (1998) for a detailed discussion of the role of external imbalances within a monetary union.

characterised by low levels of productivity and, especially on the Mediterranean coast, the construction sector is overrepresented. This has proven to be one of the particular features that have contributed to the current crisis.

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