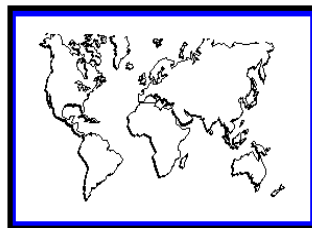# DOCUMENTOS DE ECONOMÍA Y FINANZAS INTERNACIONALES

Working Papers on International Economics and Finance

Economic growth and the balance-of-payments constraint: The case of the Spanish regions, 1988-2008

Oscar Bajo-Rubio
Carmen Díaz-Roldán

Economic growth and the balance-of-payments constraint:
The case of the Spanish regions, 1988-2008[*]

Oscar Bajo-Rubio
(Universidad de Castilla-La Mancha)

Carmen Díaz-Roldán
(Universidad de Castilla-La Mancha)

May 2011

Abstract

The balance of payments can act as a constraint to the rate of growth of output, on putting a limit to the growth in the level of demand to which supply can adapt. This effect might be even stronger for regional economies, presumably more integrated among them. In this paper, we examine this issue for the case of the Spanish regions over the period 1988-2008, 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 to economic growth for the Spanish regional economies in the period analyzed.

---

1. Introduction

Following integration with the now European Union (EU) in 1986, the Spanish economy enjoyed a period of enduring growth and structural transformations, which allowed her to make a significant progress regarding convergence towards the more advanced countries within the EU. This process was also accompanied with an increased external openness, starting from a relatively closer economy as compared to the rest of the EU member countries. The uneven evolution of exports and imports, however, was translated into a continuous and increasing trade deficit that reached record figures on the eve of the current crisis. Table 1 presents some information on these developments.

[Table 1 here]

In fact, the trade deficit has been a chronic problem of the Spanish economy, given the traditional weakness of exports, and the need for essential imports such as energy, raw materials, intermediate products, and equipment goods. During the high growth period of the 1960s, this led to the appearance of "stop-and-go" situations: when the economy grew too fast the balance of payments deteriorated, putting pressure on the exchange rate so foreign reserves fell, and a period of slower growth followed in order to correct the external disequilibrium. According to some authors, growth was subordinated to the evolution of the trade balance (see, e.g., Segura and García-Viñuela, 1978).

More generally, the balance of payments can act as a constraint to the rate of growth of output, on putting a limit to the growth in the level of demand to which supply can adapt. So, an increase in domestic output, by increasing imports, can lead to a deficit in the balance of payments, which may require either a fall in demand or an exchange rate depreciation (i.e., a worsening of the terms of trade) in order to assure the sustainability of the foreign deficit. Accordingly, an unsustainable external deficit would eventually require a correction, putting a brake on further output growth.

A customary way of analyzing this issue follows Thirlwall's approach to calculate the balance of payments-constrained growth rate, as the rate of growth of exports divided by the income elasticity of the demand for imports; see Thirlwall (1979) and Thirlwall and Hussain (1982). By comparing such a growth rate with the one prevailing in a particular country, it would be possible to assess whether the balance of payments would have worked as a constraint to economic growth in the country analyzed. This approach is equivalent to the well-known Krugman's (1989) result, so that countries growing faster face a higher income elasticity for their exports than for their imports.

On the other hand, the effect of the balance of payments on conditioning growth might be even stronger for regional economies, 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, p. 420) "regional problems of slow growth and high unemployment are, in essence, balance-of-payments problems stemming from a weak trade sector".

In addition to the significant increase in external openness and integration into the world economy above mentioned, Spain also developed a continuous process of political decentralization since the restoration of democracy at the end of the 1970s. Thus, starting from a highly centralized political system, Spain evolved towards what can be considered in many respects as a federal state. This fact, together with the availability of long-enough series on regional foreign trade, can make Spain a good candidate to explore the links between growth and foreign trade from a regional perspective. Table 2 shows the same information than in Table 1, referred to the Spanish regions over the period 1988-2008 (notice that 1988 is the first year for which regional data on foreign trade are available). As can be seen, regional data show significant differences across regions, in terms of the degree of openness and performance in the foreign markets, which are hidden when examining national-wide figures.

[Table 2 here]

In this paper, we will follow Thirlwall's (1980) suggestion, and investigate the role of the foreign sector as a potential restrictive factor on economic growth at a regional level, using data for Spain. In particular, we will analyze whether the balance of payments worked as a constraint to economic growth for the Spanish regional economies over the period 1988-2008. The underlying theoretical framework is discussed in section 2, and the empirical results are presented in section 3; finally, section 4 concludes.

2. Theoretical framework

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

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

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

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 (i.e., when $\hat{Y} > \hat{Y}^*$) should have, other things equal, a depreciating real exchange rate (provided that the Marshall-Lerner condition holds). However, as shown by Krugman (1989), in a context of imperfect competition those 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 a real exchange rate depreciation in the long run.

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 a 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 (Harrod, 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 current Constitution in 1978; world output has been proxied by the GDP of the OECD. The data are annual, and the sample period runs from 1988 (the first year for which regional data on foreign trade are available) to 2008. The data sources are the State Secretariat for Trade (Ministry of Industry, Tourism and Trade) for exports and imports; OECD.Stat for OECD's GDP; and de la Fuente (2009) for the Spanish regions' GDP.

In the first two columns of Table 3, we present the average values of the actual growth rates of the GDP of each of the regions between 1988 and 2008, and their ratio to that of the OECD over the same period (i.e., 2.595). The next three columns show the long-run income elasticities of the demands for exports and imports, together with their ratio, where the elasticities have been estimated using the method of Phillips and Hansen (1990). This method is intended to eliminate the bias that might appear in small samples when estimating using the method of ordinary least squares, and provides

estimates that are robust to the presence of serial correlation and endogeneity bias. Finally, the balance of payments-constrained growth rates appear in the last column.

[Table 3 here]

First, when comparing columns two and five, 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 for each country are plotted in Figure 1, together with the 45-degree line; this is Krugman's (1989) "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 of the Spanish average, in the case of the Balearics). 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.

[Figure 1 here]

Now we turn to compare the actual and balance of payments-constrained growth rates from columns one and six, shown in Figure 2 together with the 45-degree line. First, 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 have not worked as a constraint to the growth of the Spanish economy. This result, which would agree with that found in Bajo-Rubio (2010) for the longer period 1850-2000, hides however some differences at a regional level.

[Figure 2 here]

On the one hand, for nine regions their rates of growth appear below their balance of payments-constrained rates. This is the case of Canarias, Baleares, Madrid, Rioja, Galicia, Castilla y León, Cataluña, Cantabria, and País Vasco (although the difference for the latter is negligible). The difference between both rates is the most remarkable for the two insular economies: almost three points for the Canaries, and two for the Balearics. Accordingly, this set of regions would not show competitiveness problems, and even might have grown at a higher pace given their foreign trade performance.

On the other hand, the rates of growth of the other eight regions would appear above their balance of payments-constrained counterparts, revealing the presence of some competitiveness problems. This is the case of Murcia, Valencia, Castilla-La Mancha, Aragón, Andalucía, Asturias, Navarra, and Extremadura. The two stronger cases are those of Murcia and Valencia, for which the difference amounted to nearly one and a half and one percentage points, respectively. Most of these regions are characterized by low levels of productivity, well below the Spanish average (Reig et al., 2007; Cuadrado-Roura, 2010). These would be the cases of Murcia, Valencia, Castilla-La Mancha, Andalucía, and Extremadura, where the construction sector also has a strong weight (especially in the coastal regions). Notice also that this group includes Asturias, the Spanish region showing the lowest growth rate, around three fourths 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 process of growth since the integration with the now EU in 1986. The associated process of increased external openness led, due to the uneven evolution of exports and imports, 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, she tended to grew faster than the EU average to which she tried to converge. Accordingly, the trade deficit might appear to be a constraint to extra output growth.

In this paper, we have analyzed 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 ("comunidades autónomas") over the period 1988-2008. The process of political decentralization, since the restoration of democracy at the end of the 1970s, together with the availability of long-enough series on regional foreign trade, make Spain a good candidate to explore the links between growth and foreign trade from a regional perspective. Following Thirlwall's approach, we have calculated for each region its balance of payments-constrained growth rate, which has allowed us to assess whether the balance of payments worked as a constraint to economic growth in the regions analyzed. The value of that particular growth rate determines the limit of 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 national-wide figures. The results of the empirical application have shown that Spain as a whole grew along the period at roughly her balance of payments-constrained growth rate, so that the foreign sector would have not worked as a constraint to the growth of the Spanish economy. However, when looking at the regional level, we found that a set of regions (i.e., Canarias, Baleares, Madrid, Rioja, Galicia, Castilla y León, Cataluña, Cantabria, and País Vasco) did not seem to show competitiveness problems, since their rates of growth appear below their balance of payments-constrained rates. On the contrary, another group of regions (i.e., Murcia, Valencia, Castilla-La Mancha, Aragón, Andalucía, Asturias, Navarra, and Extremadura) showed rates of growth above their balance of payments-constrained rates. Most of these regions are characterized by low levels of productivity together with a strong weight of the construction sector, which has proved to be one of the particular features that have contributed to the current crisis in Spain.

These results could be of interest for the design of future regional policies in Spain. In particular, they would stress the need of further increases in productivity in the last set of regions, in order to fostering competitiveness and improving their future growth prospects.

References

Bajo-Rubio, O. (2010): "The balance-of-payments constraint on economic growth in a long-term perspective: Spain, 1850-2000", Working Paper on International Economics and Finance 10-10, Asociación Española de Economía y Finanzas Internacionales (available online at http://www.aeefi.com/RePEc/pdf/defi10-10.pdf).

Cuadrado-Roura, J. R. (2010): "Regional growth and regional policies: Lessons from the Spanish experience", in Cuadrado-Roura, J. R. (ed.): *Regional Policy, Economic Growth and Convergence: Lessons from the Spanish Case*, Springer, Berlin, 285-311.

de la Fuente, A. (2009): "Series enlazadas de algunos agregados económicos nacionales y regionales, 1955-2007. Versión 2.1", UFAE and IAE Working Paper 784.09.

Goldstein, M. and Khan, M. S. (1985): "Income and price effects in foreign trade", in Jones, R. W. and Kenen, P. B. (eds.): *Handbook of International Economics*, vol. 2, North-Holland, Amsterdam, 1041-1105.

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

Krugman, P. (1989): "Differences in income elasticities and trends in real exchange rates", *European Economic Review* 33, 1031-1054.

Phillips, P. C. B. and Hansen, B. E. (1990): "Statistical inference in instrumental variables regression with I(1) processes", *Review of Economic Studies* 57, 99-125.

Reig, E. (dir.); Mas, M.; Paluzie, E.; Pons, J.; Quesada, J.; Robledo, J. C. and Tirado, D. A. (2007): *Competitividad, crecimiento y capitalización de las regiones españolas*, Fundación BBVA, Bilbao.

Segura, J. and García-Viñuela, E. (1978): "El déficit comercial de la economía española", *Información Comercial Española* 536, 13-23.

Thirlwall, A. P. (1979): "The balance of payments constraint as an explanation of international growth rate differences", *Banca Nazionale del Lavoro Quarterly Review* 128, 45-53.

Thirlwall, A. P. (1980): "Regional problems are 'balance-of-payments' problems", *Regional Studies* 14, 419-425.

Thirlwall, A. P. and Hussain, M. N. (1982): "The balance of payments constraint, capital flows and growth rate differences between developing countries", *Oxford Economic Papers* 34, 498-510.

TABLE 1
Growth and foreign trade: Spain, 1986-2008

	Rate of growth of GDP (%)	Real exports (million euros)	Real imports (million euros)	Trade balance (million euros)	Rate of coverage (%)	Rate of openness (%)
1986-1989	4.74	358,215	489,354	-131,139	68.61	28.95
1990-1993	1.37	495,451	758,218	-262,767	66.97	29.04
1994-1997	2.71	820,789	1040,588	-219,799	81.97	38.62
1998-2001	4.01	1172,965	1599,938	-426,973	76.20	47.90
2002-2005	2.95	1431,655	2054,541	-622,886	71.92	46.78
2006-2008	3.07	1631,357	2580,154	-948,797	65.49	48.80
1986-2008	3.14	956,973	1370,044	-413,071	72.14	39.63

Source: Spanish Ministry of Industry, Tourism and Trade; and de la Fuente (2009).

TABLE 2
Growth and foreign trade: Spanish regions, 1988-2008

|	Rate of growth of GDP (%)	Real exports (million euros)	Real imports (million euros)	Trade balance (million euros)	Rate of coverage (%)	Rate of openness (%)
Andalucía	3.12	89,150	107,805	-18,655	90.82	23.88
Aragón	2.67	49,140	46,311	2,829	116.59	49.96
Asturias	2.01	16,233	19,288	-3,055	94.41	25.43
Baleares	2.77	7,266	13,483	-6,217	52.20	14.15
Canarias	2.95	7,564	34,158	-26,594	21.79	18.78
Cantabria	2.75	11,575	13,670	-2,095	87.37	33.33
Castilla y León	2.51	59,823	62,012	-2,189	97.30	35.99
Castilla-La Mancha	2.93	16,016	29,885	-13,869	62.91	21.01
Cataluña	2.83	268,901	422,752	-153,851	64.00	60.00
Valencia	2.93	127,216	114,253	12,964	125.23	41.73
Extremadura	2.99	6,229	4,112	2,117	170.92	9.72
Galicia	2.58	68,410	76,359	-7,950	87.10	43.58
Madrid	3.28	106,854	339,914	-233,060	31.47	42.08
Murcia	3.44	26,187	36,274	-10,087	98.00	40.13
Navarra	3.04	35,761	29,997	5,764	128.31	63.44
País Vasco	2.76	96,613	93,025	3,588	108.08	50.32
Rioja	2.91	6,521	5,377	1,144	120.00	26.05
Spain	2.92	1015,891	1462,240	-446,350	72.03	40.72

Source: Spanish Ministry of Industry, Tourism and Trade; and de la Fuente (2009).

TABLE 3

Actual growth rate, trade elasticities, and the balance of payments-constrained growth rate: Spanish regions, 1988-2008

	$\hat{Y}$	$\hat{Y}/\hat{Y}^*$	ε_{X,Y^*}	$\varepsilon_{M,Y}$	$\varepsilon_{X,Y^*}/\varepsilon_{M,Y}$	$\hat{Y}_B$
Andalucía	3.124	1.204	2.769	2.882	0.961	2.494
Aragón	2.666	1.027	2.550	3.277	0.778	2.020
Asturias	2.008	0.774	2.623	4.605	0.570	1.478
Baleares	2.767	1.066	4.491	2.443	1.838	4.771
Canarias	2.946	1.135	2.503	1.116	2.243	5.821
Cantabria	2.753	1.061	3.259	2.806	1.161	3.014
Castilla y León	2.507	0.966	3.381	3.038	1.113	2.888
Castilla-La Mancha	2.934	1.131	3.583	4.282	0.837	2.172
Cataluña	2.829	1.090	3.461	2.800	1.236	3.208
Valencia	2.925	1.127	2.209	2.932	0.753	1.955
Extremadura	2.986	1.151	4.195	4.080	1.028	2.668
Galicia	2.584	0.996	4.534	3.937	1.152	2.989
Madrid	3.280	1.264	3.663	2.380	1.539	3.994
Murcia	3.435	1.323	3.009	3.903	0.771	2.001
Navarra	3.035	1.169	2.950	2.841	1.038	2.695
País Vasco	2.759	1.063	2.857	2.658	1.075	2.790
Rioja	2.905	1.119	3.704	2.723	1.360	3.530
Spain	2.920	1.125	3.108	2.791	1.114	2.890

8

FIGURE 1
**Actual growth rates relative to OECD, and ratio of income elasticities for exports
and imports: Spanish regions, 1988-2008**
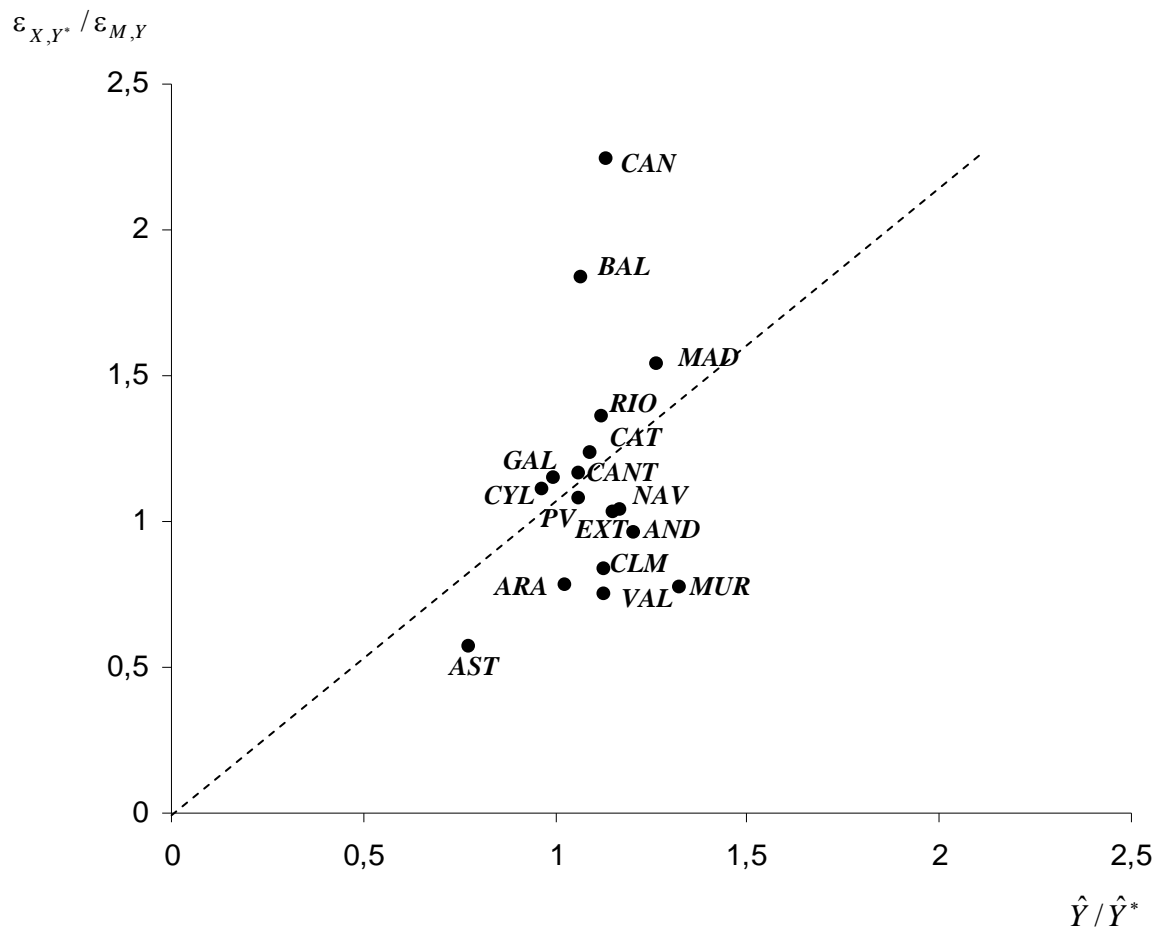
FIGURE 2
Actual and balance of payments-constrained growth rates: Spanish regions, 1988-2008