

# Sustainability of external imbalances in the OECD countries\*

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June 2011

## Abstract

In this paper, we provide a test of the sustainability of external imbalances in the OECD countries, over the years 1970-2007. Specifically, we deal with the case of those countries that have experienced current account deficits in more than half of the years throughout the period of analysis, and address the recent critique of Bohn (2007) on unit root and cointegration tests of the intertemporal budget constraint.

JEL classification: F32, F41.

Keywords: External imbalances, Sustainability, Current account.

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\* The authors acknowledge financial support from the Spanish Institute for Fiscal Studies, the Spanish Ministry of Science and Innovation (Projects ECO2008-05072-C02-01 –O. Bajo-Rubio and C. Díaz-Roldán– and ECO2008-05908-C02-02 –V. Esteve–), and the Department of Education and Science of the regional government of Castilla-La Mancha (Project PEII09-0072-7392). V. Esteve also acknowledges support from the Generalitat Valenciana (Project GVPROMETEO2009-098) and the Fundación Séneca-Regional Agency of Science and Technology of the regional government of Murcia (Project 15363/PHCS/10).

## **1. Introduction**

Global external imbalances seem nowadays to be quite different as compared to those prevailing in the past. First, they mostly affect to rich countries, both the US and within the euro area. In addition, they are primarily driven by private saving and investment decisions, rather than by government deficits. Moreover, these imbalances are financed in a more orthodox way (i.e., through either direct or portfolio investment), rather than through bank lending. Accordingly, these imbalances are a matter of concern for such countries, requiring an adequate policy answer (Blanchard, 2007).

The problem of global external disequilibria relates in turn to the current international financial crisis, as discussed at length in Obstfeld and Rogoff (2010). Regarding the case of the European Union (EU), those countries with the highest current account disequilibria are those that have experienced a greater fall in their levels of domestic demand (Lane, 2010). Moreover, it has been argued that for these countries, usually the eurozone members with lower income levels, borrowing in international markets would have become easier before the beginning of the crisis. In fact, the greater financial integration, together with the adoption of the euro, would have meant a reduction in the cost of capital and the disappearance of exchange rate risk. As a result, this would have translated into both a decrease in saving and an increase in investment, and hence into a deterioration of the current account balance (Blanchard and Giavazzi, 2002). Even more, the prospects of convergence as regards the richer countries would have favour growth expectations in those countries, which contributed additionally to greater deficits; see Lane (2010). However, unlike the case of the US, where the size of the external deficit has led to a wide academic debate [see, e.g., Mann (2002), Blanchard, Giavazzi and Sa (2005), Edwards (2005) or Obstfeld and Rogoff (2007)], this has not been the norm in the European case, with a predominance of descriptive studies of a limited analytical content.

The usual way to analyzing current account imbalances makes use of the intertemporal approach to the current account (Sachs, 1981; Obstfeld and Rogoff, 1995; Razin, 1995). According to this approach, given that, from the perspective of the national accounts, the current account equals the difference between savings and investment, and, because savings and investment decisions are based on intertemporal factors (such as life-cycle features, the expected returns of investment projects, and the like) the current account is necessarily an intertemporal phenomenon.

An implication of this approach asserts that, if government's accounts are balanced, a high current account deficit should not be a matter of concern, provided that savings and investment decisions are taken optimally by private agents. This is the so-called "Lawson doctrine", from the British Chancellor of the Exchequer in the 1980s, Nigel Lawson; see Corden (2007) for a defence of this view. However, the problems associated with the serious imbalances experienced by several emerging countries in the 1980s and 1990s, led to a generalized critique of the Lawson doctrine, so yielding a renewed interest on the sustainability of external deficits. See Edwards (2002) for a survey on the relevance of the current account in the evolution of an economy.

In an important contribution, Milesi-Ferretti and Razin (1996) discuss the usual notion of sustainability in relation to the country's intertemporal solvency, that is, when the present discounted value of future trade surpluses equals current external indebtedness. Put in other words, current account sustainability would be defined as the

ability of an economy of satisfying its intertemporal constraint in the long run, in absence of a drastic change either in the behaviour of the private sector or in economic policy (Taylor, 2002). In general, a current account deficit in excess of 5% of GDP is regarded as unsustainable, so that above this threshold the adjustment process of the current account usually begins (Freund, 2005).

Following this general approach several papers have appeared, which test for current account sustainability by using cointegration analysis. Specifically, a current account deficit would be sustainable if the series for exports and imports were cointegrated; see, e.g., Husted (1992), Wickens and Uctum (1993), Wu, Fountas and Chen (1996), or Apergis, Katrakilidis and Tabakis (2000), to name a few. An alternative approach would consist of analyzing the joint evolution of the current account balance and the net foreign asset position, instead of that of exports and imports; this would be the case, e.g., of Lane and Milesi-Ferretti (2001, 2002) or Camarero, Carrion-i-Silvestre and Tamarit (2010).

However, traditional analyses of sustainability (for either the public deficit or the external deficit) have been recently criticized by Bohn (2007). According to this author, these tests, based on unit root and cointegration tests of the (government's or nation's) intertemporal budget constraint, are incapable of rejecting the existence of sustainability. In place of the traditional method, Bohn proposes an alternative approach, based on the existence of an arbitrarily high order of integration of the variables involved, and on error-correction-type policy reaction functions. This methodology has been applied in Bajo-Rubio, Díaz-Roldán and Esteve (2010) to analyze the sustainability of the Spanish public deficit in a long-term perspective, for the period 1850-2000; and in Durdu, Mendoza and Terrones (2010) for the case of the sustainability of the external deficit, using a panel of 50 countries, both industrial and emerging, along the period 1970-2004.

Therefore, in this paper we will use Bohn's approach in the same way as in Bajo-Rubio, Díaz-Roldán and Esteve (2010), that is, through estimations with time series data, for the case of the sustainability of external imbalances in those OECD countries experiencing current account deficits in more than half of the years along the period 1970-2007. The paper is organized as follows. In section 2, we describe the underlying theoretical framework. A descriptive account of the current account imbalances in the OECD countries is provided in section 3. Next, in section 4 we introduce the empirical methodology, and discuss the data and the empirical results. The main conclusions are summarized in section 5.

## **2. Theoretical framework**

The sustainability of external deficits is a matter of concern for governments, and is related to the issue of long-run solvency. A current account deficit is regarded as sustainable when, if maintained in the indefinite future, it does not violate the nation's solvency constraint; and a nation is said to be solvent if the present-value budget constraint, i.e., its intertemporal budget constraint (IBC) holds. In other words, a deficit can be sustainable if the country can borrow. However, if the interest rate on the external debt exceeds the growth rate of the economy, debt dynamics would lead to an ever-increasing ratio of debt to GDP. The dynamics of debt accumulation could be stopped only if the ratio of the external deficit to GDP would turn to be a surplus.

The customary approach for analyzing external imbalances is based on the intertemporal approach to the current account. Under this approach, the current account (i.e., changes in a country's net indebtedness) is considered as an intertemporal issue, since decisions on indebtedness imply changes in future consumption possibilities and these are based on expectations of the entire future path of a number of variables. The intertemporal model of the current account originates in the work of, among others, Sachs (1981, 1982), Obstfeld (1982), and Svensson and Razin (1983); some overviews are provided in Obstfeld and Rogoff (1995) and Razin (1995).

We start with some accounting identities. In period  $t$ , the current account, i.e., the change in net foreign assets vis-à-vis the rest of the world, equals net exports of goods and services plus net factor payments from abroad<sup>1</sup>:

$$\Delta NFA_t = CA_t = NX_t + rNFA_{t-1} \quad (1)$$

where  $CA$ ,  $NFA$  and  $NX$  stand for the current account, net foreign assets and net exports, respectively, all of them in real terms, and  $r$  is a (constant) real interest rate. Notice that when  $NFA > 0$  the country is a net creditor, and when  $NFA < 0$  the country is a net debtor. Alternatively:

$$\Delta NFA_t = CA_t = Q_t + rNFA_{t-1} - (C + I) = S - I \quad (2)$$

where  $Q$  is gross domestic product (GDP, so  $Q + rNFA_{t-1}$  is gross national product), and  $C$ ,  $S$  and  $I$  denote total (i.e., private plus public) consumption, saving and investment, respectively. As can be seen, equation (2) links the current account balance with decisions on saving and investment.

Since (1) holds every period, solving for  $NFA_t$  and iterating forward over an infinite horizon yields the nation's IBC, written in terms of GDP shares:

$$nfa_t = -\sum_{j=0}^{\infty} \left( \frac{1+g}{1+r} \right)^{j+1} E_t nx_{t+j+1} + \lim_{j \rightarrow \infty} \left( \frac{1+g}{1+r} \right)^{j+1} E_t nfa_{t+j+1} \quad (3)$$

where  $nfa$  and  $nx$  denote, respectively, net foreign assets and net exports, both as ratios to GDP;  $E$  is the expectations operator; and  $g$  stands for the rate of growth of real GDP, assumed (as the real interest rate) to be constant for simplicity. The condition for current account sustainability is:

$$\lim_{j \rightarrow \infty} \left( \frac{1+g}{1+r} \right)^{j+1} E_t nfa_{t+j+1} = 0 \quad (4)$$

i.e., the transversality condition; or, equivalently:

$$nfa_t = -\sum_{j=0}^{\infty} \left( \frac{1+g}{1+r} \right)^{j+1} E_t nx_{t+j+1} \quad (5)$$

By multiplying both sides of (5) by  $-1$ , so that the country is a net debtor, we can see that solvency requires that the country must run expected future trade surpluses equal, in present-value terms, to the current value of its outstanding net liabilities vis-à-vis the rest of the world.

The standard approach to test for sustainability of the current account consists of estimating a cointegration relationship between net exports and the (lagged) level of net foreign assets, both as ratios to GDP:

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<sup>1</sup> Notice that we are omitting here unilateral transfers, usually a small item in the balance of payments. Alternatively, net exports could be assumed net of transfers.

$$nx_t = \alpha + \beta nfa_{t-1} + v_t \quad (6)$$

where  $v_t$  denotes an error term. In this equation, a negative and significant estimate of  $\beta$  would be a sufficient condition for solvency, indicating that the nation satisfies its present-value budget constraint.

Testing whether  $\beta < 0$  from the estimation of (6) or, alternatively, whether  $\beta' = 1$  from the estimation of a cointegration relationship such as:

$$exp_t = \alpha' + \beta' imp_t + \varepsilon_t \quad (7)$$

where  $exp_t$  and  $imp_t$  denote, respectively, the GDP ratios of the exports of goods and services, and the imports of goods and services plus net interest payments and net transfer payments, and  $\varepsilon_t$  is an error term, are customary approaches to test for the sustainability of external imbalances.

However, this kind of assessments of external sustainability based on unit root and cointegration tests have been recently criticized by Bohn (2007), on the grounds that such tests are incapable of rejecting sustainability. Specifically, Bohn derives the following three propositions, related to the order of integration of net foreign assets, net exports, exports, and imports, in order to verify under which conditions the transversality condition and the IBC hold (see Bohn (2007) for details):

- (i) If  $nfa_t$  is integrated of order  $m$  for any finite  $m \geq 0$ , then  $nfa_t$  satisfies the transversality condition, and  $nfa_t$  and  $nx_t$  satisfy the IBC.
- (ii) If  $exp_t$  and  $imp_t$  are integrated of order  $m_X$  and  $m_M$ , respectively, where  $\Delta nfa_t = exp_t - imp_t$ ; then  $nfa_t$  is integrated of order  $m$  with  $m \leq \max(m_X, m_M) + 1$ , so the transversality condition and the IBC hold.
- (iii) If  $nfa_t$  and  $nx_t$  follow an error-correction specification of the form  $nx_t + \rho nfa_{t-1} = z_t$ , and  $z_t$  is integrated of order  $m$  for some  $\rho < 0$  such that  $|\rho| \in (0, 1+r]$  where  $r$  is a constant interest rate, then  $nfa_t$  satisfies the transversality condition and the IBC holds.

Notice, on the other hand, that these are just sufficient conditions, so that a failure of the tests would not mean a rejection of sustainability.

### 3. Current account imbalances in the OECD countries

In this section, we will present a descriptive account of the current account imbalances in the OECD countries. We will focus our analysis on those countries that have experienced current account deficits in more than half of the years along our sample period, since these will be the countries facing potential sustainability problems. Specifically, we will analyze the cases of Australia, Austria, Canada, Greece, Ireland, Italy, New Zealand, Portugal, Spain, the UK, and the US.

Figure 1 shows current account balances, measured as percentages of GDP, for the above countries over the years 1970 to 2007. The data source is the International Monetary Fund's *International Financial Statistics*. The choice of the sample period is dictated by the availability of data on net foreign asset positions, taken from Lane and Milesi-Ferretti (2007); see the next section.

[Figure 1 here]

As mentioned before, all these countries have registered a current account deficit over most of the period of analysis extending over 1970 to 2007, i.e., 38 years. In particular, the number of years for which a current account deficit appears is 36 for Australia, 26 for Austria, 26 for Canada, 38 for Greece, 28 for Ireland, 23 for Italy, 37 for New Zealand, 29 for Portugal (in this case, the data start in 1972), 29 for Spain, 27 for the UK, and 30 for the US. The average value of the deficit in terms of GDP ranges from 0.36 % for Italy to 5.53% for New Zealand.

As can be seen in Figure 1, Australia shows a trend of growing external deficits over the period of analysis, reaching around 7% of GDP at the end of the sample. In turn, despite the prevalence of deficits over most of the period, both Austria and Canada have experienced external surpluses in last years. In the cases of Ireland and Italy, deficits disappeared over the 1990s, to return, at an increasing path, after 2000. The presence of external deficits has been continuous in Greece, New Zealand, Portugal, and Spain, but they reached very high figures in terms of GDP only after the end of the 1990s: 14% for Greece, 8% for New Zealand, and 10% for Portugal and Spain in 2007. Unlike these countries, and despite registering also continuous deficits, the UK has been able to keep them at moderate levels, amounting to 2.5% of GDP in 2007. Finally, US external deficits show an increasing path along the period, so in the last year of the sample the deficit reached 5% of GDP (although it was the highest of the world, in absolute terms).

#### **4. Data and empirical results**

In this section, we provide a test of Bohn's three propositions for the case of the sustainability of current account imbalances in the OECD countries. We use data on net exports and net foreign assets, as well as on exports and imports of goods and services (the latter augmented with net interest payments and net transfer payments), all of them as percentages of GDP, for those OECD countries experiencing current account deficits in more than half of the years along our sample period. These countries are Australia, Austria, Canada, Greece, Ireland, Italy, New Zealand, Portugal, Spain, the UK, and the US. The data are annual, and have been taken from the International Monetary Fund's *International Financial Statistics*, except for the net foreign asset positions, taken from the updated and extended version of the External Wealth of Nations Mark II database developed by Lane and Milesi-Ferretti (2007). The sample period runs from 1970 to 2007, i.e., the last year for which the data on net foreign asset positions are available.

In a related paper, Durdu, Mendoza and Terrones (2010) analyze the sustainability of external imbalances, using a panel of 50 countries (21 industrial and 29 emerging) along the period 1970-2004. In this paper, however, we will focus only on those countries experiencing external deficits, since sustainability should apply to deficits rather than surpluses, for the case of industrial countries. In addition, we will perform the analysis on a country-by-country basis, since panel estimation can hide the different behaviour of specific countries regarding sustainability of their external imbalances.

We begin by testing for the order of integration of the variables  $nfa_t$ ,  $exp_t$ , and  $imp_t$ , using the tests of Ng and Perron (2001). These authors proposed using the tests statistics  $MZ_\alpha^{GLS}$  and  $MZ_t^{GLS}$ , which are modified versions of the  $Z_\alpha$  and  $Z_t$  tests of Phillips and Perron (1988), computed after detrending the series under analysis using the method of

Generalized Least Squares (GLS). Such modifications improve the tests with regard to both size distortions and power. According to the results in Table 1, the presence of two unit roots is clearly rejected at the conventional significance levels; and the null hypothesis of no stationarity cannot be rejected in all cases but the variable  $imp_t$  for Australia, where it would be rejected at the 10% level. Therefore, with the only exception of  $imp_t$  for Australia, the three series would be concluded to be non-stationary, and the first two propositions of Bohn (2007) would hold.

[Table 1 here]

Next, we estimate, using the method of Non-Linear Least Squares, the error-correction specification analogue to (6):

$$\Delta nx_t = \omega + \delta(L)\Delta nfa_{t-1} + \rho(nx_{t-1} - \alpha - \beta nfa_{t-2}) + \gamma(L)\Delta nx_t + \eta_t \quad (8)$$

where  $\eta_t$  is an error term, and the results are shown in Table 2. As can be seen, the error-correction coefficient  $\rho$  always shows the expected negative sign, and is significant at the conventional levels in all cases with the only exception of Ireland, where significance only appears at the 15% level. Regarding the long-run coefficient  $\beta$ , we find:

- a negative and statistically significant coefficient for Austria, Canada, Italy, and New Zealand
- a positive and statistically significant coefficient for Australia, Portugal, Spain, and the US
- a non significant coefficient for Greece, Ireland, and the UK

[Table 2 here]

Hence, the third proposition of Bohn (2007) would hold, and the current account deficit would be sustainable, only for the cases of Austria, Canada, Italy, and New Zealand. In particular, the adjustment of the net exports-GDP ratio to a given change in the net foreign assets-GDP ratio would have had an average half-life of about one, three, one, and half a year, respectively<sup>2</sup>.

On the contrary, in the cases of Australia, Greece, Ireland, Portugal, Spain, the UK, and the US, Bohn's (2007) third proposition would not hold, so no evidence is found on the fulfilment of the nation's IBC for these countries. Notice, however, that Bohn's approach gives only sufficiency conditions for sustainability to hold; in other words, if the tests yield positive results this means evidence indicating that the IBC holds, but failure of the tests does not reject it.

## 5. Conclusions

In this paper, we have tested for the sustainability of external imbalances in the OECD countries, over the years 1970-2007, addressing the recent critique of Bohn (2007) on previous unit root and cointegration tests of the IBC. Unlike Durdu, Mendoza and Terrones (2010), we analyze the case of only those countries undergoing current account deficits in more than half of the years throughout this period, since sustainability should apply to deficits rather than surpluses; and on a country-by-country basis, since panel estimation can hide the different behaviour of specific countries.

<sup>2</sup> Computed as  $\log(0.5)/\log(1-|\hat{\rho}|)$ , where  $\hat{\rho}$  is the estimate of  $\rho$  in equation (8), from the second column of Table 2.

Our results show that the three variables net foreign assets, exports of goods and services, and imports of goods and services (augmented with net interest payments and net transfer payments) would be integrated of order one in the all countries analyzed, except for  $imp_t$  for Australia (even though at a 10% significance level). Accordingly, the IBC would hold in principle for all of them, with the possible exception of Australia.

However, when estimating an error-correction relationship between net exports and net foreign assets, the long-run coefficient had the expected (negative) sign, and was statistically significant, for Austria, Canada, Italy, and New Zealand, so that for these countries the current account deficit would be sustainable. On the contrary, in the cases of Australia, Greece, Ireland, Portugal, Spain, the UK, and the US, no clear-cut results emerge, i.e., the IBC would fail in principle to hold but, since Bohn's approach gives only sufficiency conditions, a failure of the tests does not mean a rejection of sustainability.



## References

Apergis, N., Katrakilidis, K. P. and Tabakis, N. M. (2000): "Current account deficit sustainability: The case of Greece", *Applied Economics Letters* 7, 599-603.

Bajo-Rubio, O., Díaz-Roldán, C. and Esteve, V. (2010): "Government deficit sustainability, and monetary versus fiscal dominance: The case of Spain, 1850-2000", Working Paper on International Economics and Finance 10-04, Spanish Association of International Economics and Finance.

Blanchard, O. (2007): "Current account deficits in rich countries", *IMF Staff Papers* 54, 191-219.

Blanchard, O. and Giavazzi, F. (2002): "Current account deficits in the euro area: The end of the Feldstein-Horioka puzzle?", *Brookings Papers on Economic Activity* 2, 147-209.

Blanchard, O., Giavazzi, F. and Sa, F. (2005): "International investors, the U.S. current account, and the dollar", *Brookings Papers on Economic Activity* 1, 1-49.

Bohn, H. (2007): "Are stationarity and cointegration restrictions really necessary for the intertemporal budget constraint?", *Journal of Monetary Economics* 54, 1837-1847.

Camarero, M., Carrion-i-Silvestre, J. L. and Tamarit, C. (2010): "External imbalances in a monetary union. Does the Lawson doctrine apply to Europe?", Working Paper on International Economics and Finance 10-09, Spanish Association of International Economics and Finance.

Corden, W. M. (2007): "Those current account imbalances: A sceptical view", *The World Economy* 30, 363-382.

Durdu, C. B., Mendoza, E. G. and Terrones, M. E. (2010): "On the solvency of nations: Are global imbalances consistent with intertemporal budget constraints?", Working Paper WP/10/50, International Monetary Fund.

Edwards, S. (2002): "Does the current account matter?", in Edwards, S. and Frankel, J. A. (eds.): *Preventing currency crises in emerging markets*, The University of Chicago Press, Chicago, 21-69.

Edwards, S. (2005): "Is the U.S. current account deficit sustainable? If not, how costly is adjustment likely to be?", *Brookings Papers on Economic Activity* 1, 211-288.

Freund, C. (2005): "Current account adjustment in industrial countries", *Journal of International Money and Finance* 24, 1278-1298.

Husted, S. (1992): "The emerging U.S. current account deficit in the 1980s: A cointegration analysis", *Review of Economics and Statistics* 74, 159-166.

Lane, P. R. (2010): "A European perspective on external imbalances", Report 2010:5, Svenska Institutet for Europapolitiska Studier.

- Lane, P. R. and Milesi-Ferretti, G. M. (2001): “The external wealth of nations: Measures of foreign assets and liabilities for industrial and developing countries”, *Journal of International Economics* 55, 263-294.
- Lane, P. R. and Milesi-Ferretti, G. M. (2002): “External wealth, the trade balance, and the real exchange rate”, *European Economic Review* 42, 1049-1071.
- Lane, P. R. and Milesi-Ferretti, G. M. (2007): “The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970-2004”, *Journal of International Economics* 73, 223-250.
- Mann, C. L. (2002): “Perspectives on the U.S. current account deficit and sustainability”, *Journal of Economic Perspectives* 16, 131-152.
- Milesi-Ferretti, G. M. and Razin, A. (1996): *Current-account sustainability*, Princeton Studies in International Finance 81, Princeton University.
- Ng, S. and Perron, P. (2001): “Lag length selection and the construction of unit root tests with good size and power”, *Econometrica* 69, 1529-1554.
- Obstfeld, M. (1982): “Aggregate spending and the terms of trade: Is there a Laursen-Metzler effect?”, *Quarterly Journal of Economics* 97, 251-270.
- Obstfeld, M. and Rogoff, K. (1995): “The intertemporal approach to the current account”, in Grossman, G. and Rogoff, K. (eds.): *Handbook of International Economics* (Vol. 3), North-Holland, Amsterdam, 1731-1799.
- Obstfeld, M. and Rogoff, K. (2007): “The unsustainable U.S. current account position revisited”, in Clarida, R. H. (ed.): *G7 current account imbalances: Sustainability and adjustment*, The University of Chicago Press, Chicago, 339-366.
- Obstfeld, M. and Rogoff, K. (2010): “Global imbalances and the financial crisis: Products of common causes”, in Glick, R. and Spiegel, M. M. (eds.): *Asia and the global financial crisis*, Federal Reserve Bank of San Francisco, 131-172.
- Perron, P. and Ng, S. (1996): “Useful modifications to some unit root tests with dependent errors and their local asymptotic properties”, *Review of Economic Studies* 63, 435-463.
- Phillips, P. C. B. and Perron, P. (1988): “Testing for a unit root in time series regression”, *Biometrika* 75, 335-346.
- Razin, A. (1995): “The dynamic-optimizing approach to the current account: Theory and evidence”, in Kenen, P. B. (ed.): *Understanding interdependence: The macroeconomics of the open economy*, Princeton University Press, Princeton, 169-198.
- Sachs, J. (1981): “The current account and macroeconomic adjustment in the 1970’s”, *Brookings Papers on Economic Activity* 1, 201-268.

Sachs, J. (1982): "The current account in the macroeconomic adjustment process", *Scandinavian Journal of Economics* 84, 147-159.

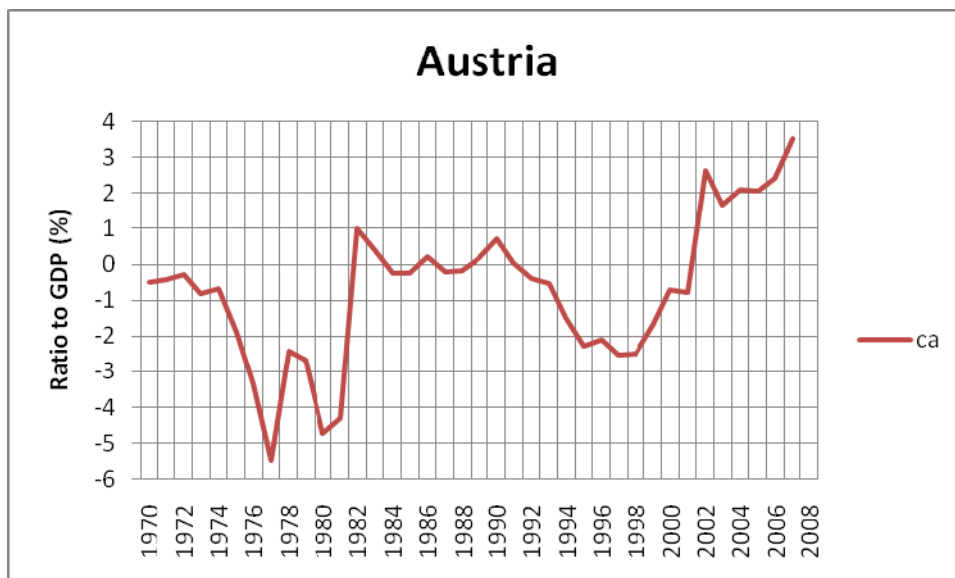
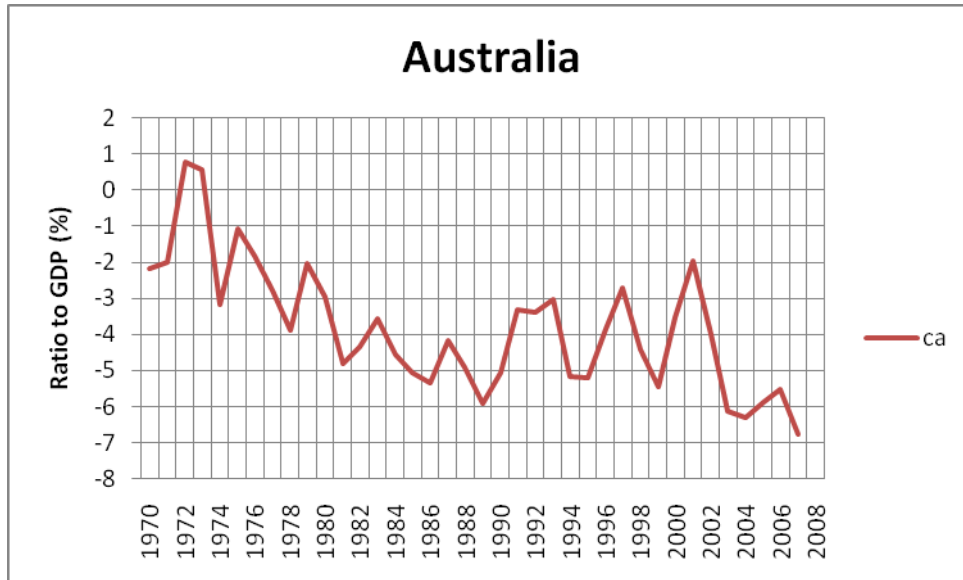
Svensson, L. E. O. and Razin, A. (1983): "The terms of trade and the current account: The Harberger-Laursen-Metzler effect", *Journal of Political Economy* 91, 97-125.

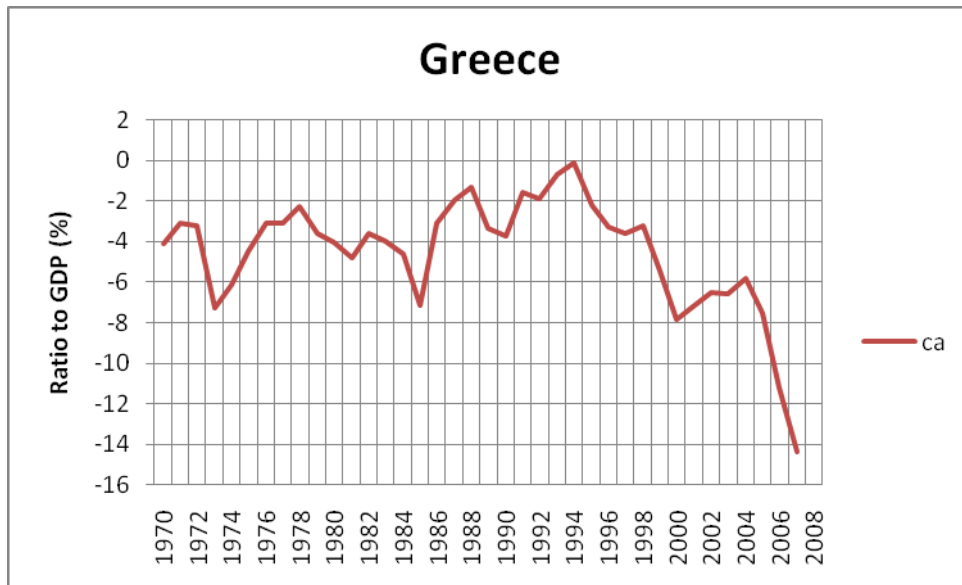
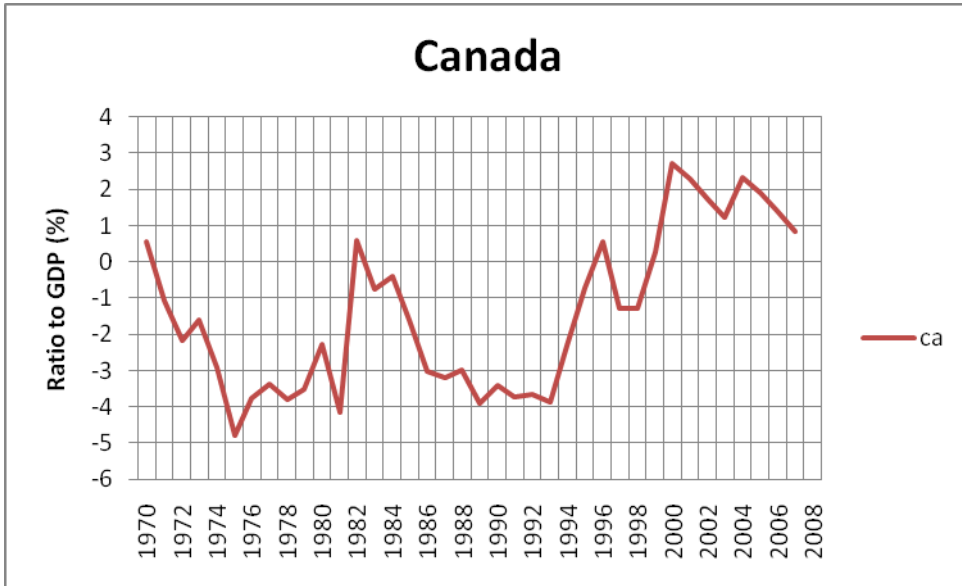
Taylor, A. M. (2002): "A century of current account dynamics", *Journal of International Money and Finance* 21, 725-748.

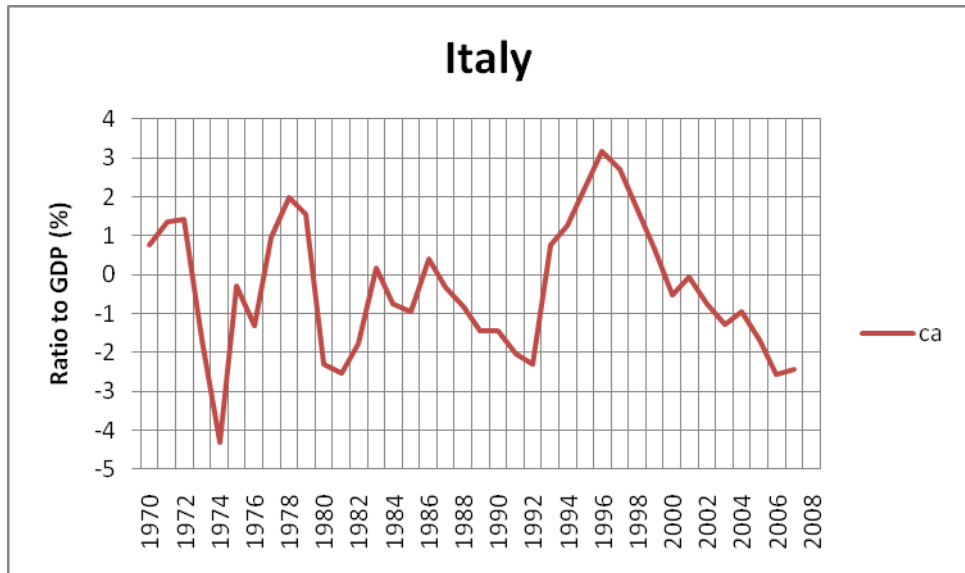
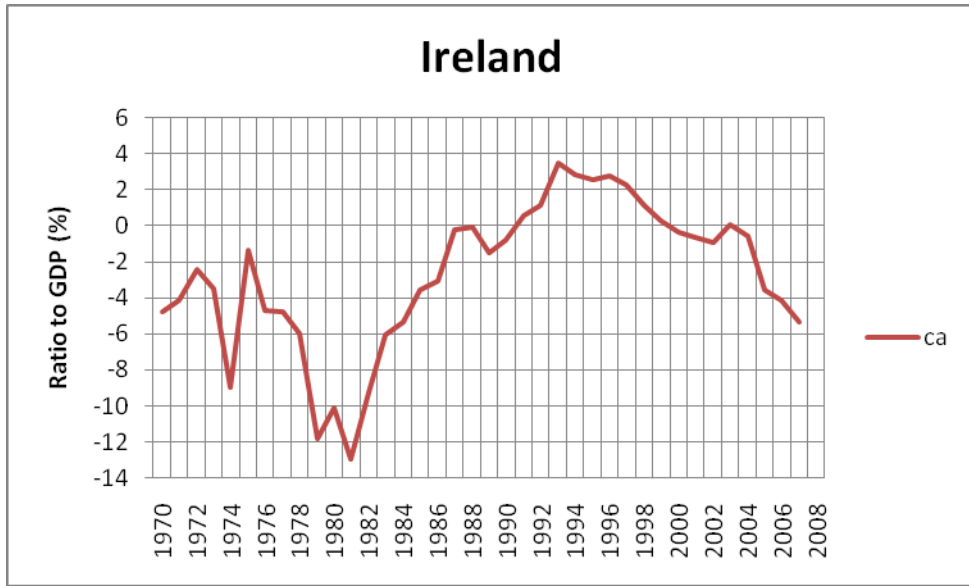
Wickens, M. R. and Uctum, M. (1993): "The sustainability of current account deficits: A test of the US intertemporal budget constraint", *Journal of Economic Dynamics and Control* 17, 423-441.

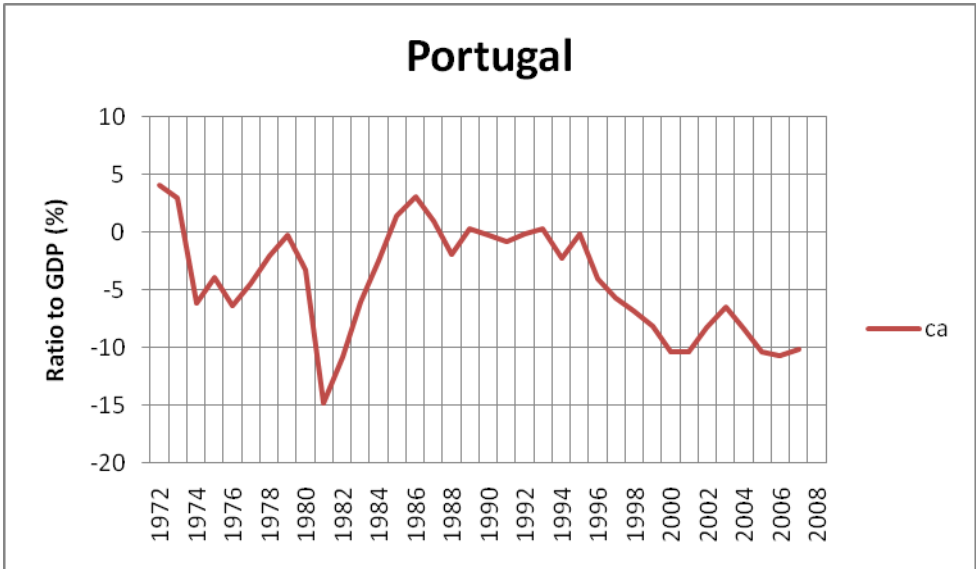
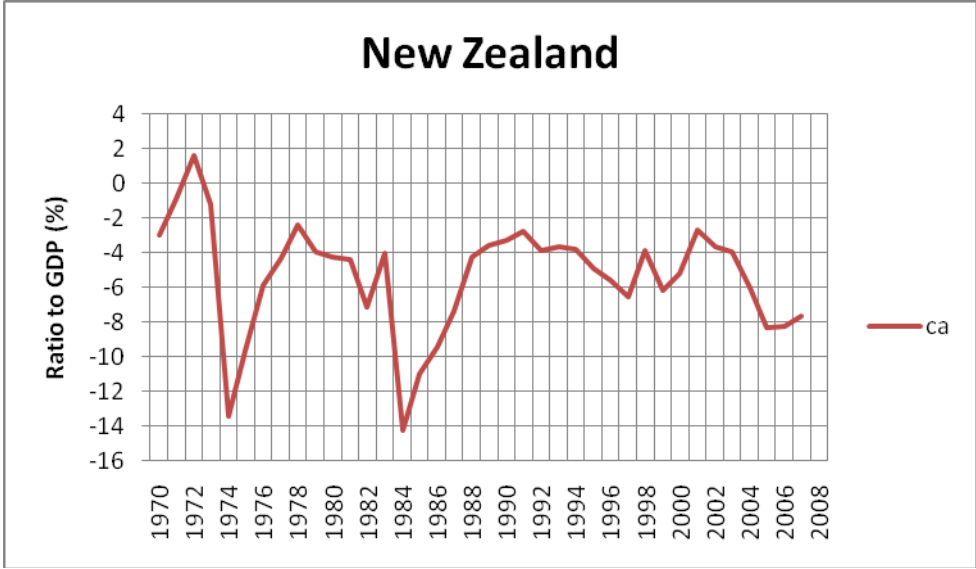
Wu, J., Fountas, S. and Chen, S. (1996): "Testing for the sustainability of the current account deficit in two industrial countries", *Economics Letters* 52, 193-198.

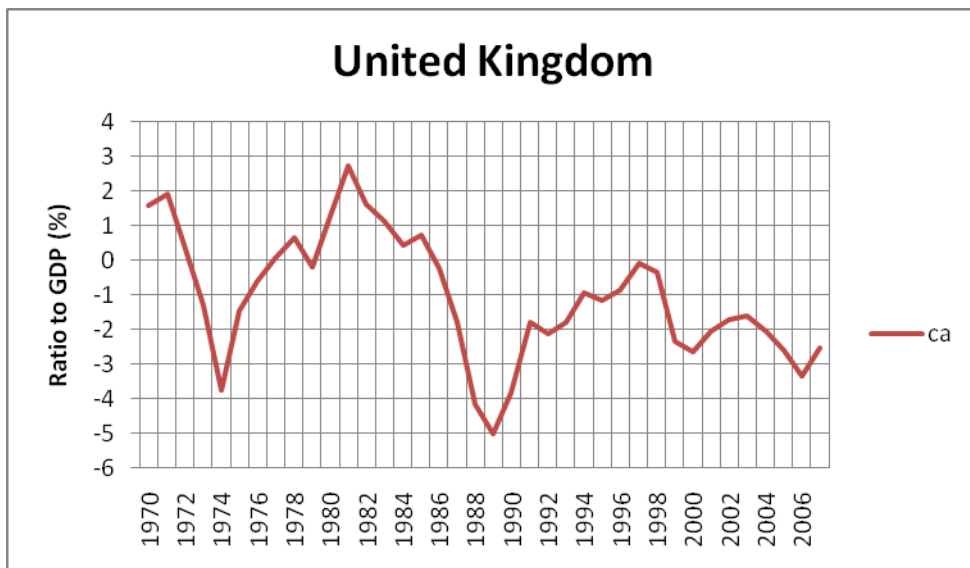
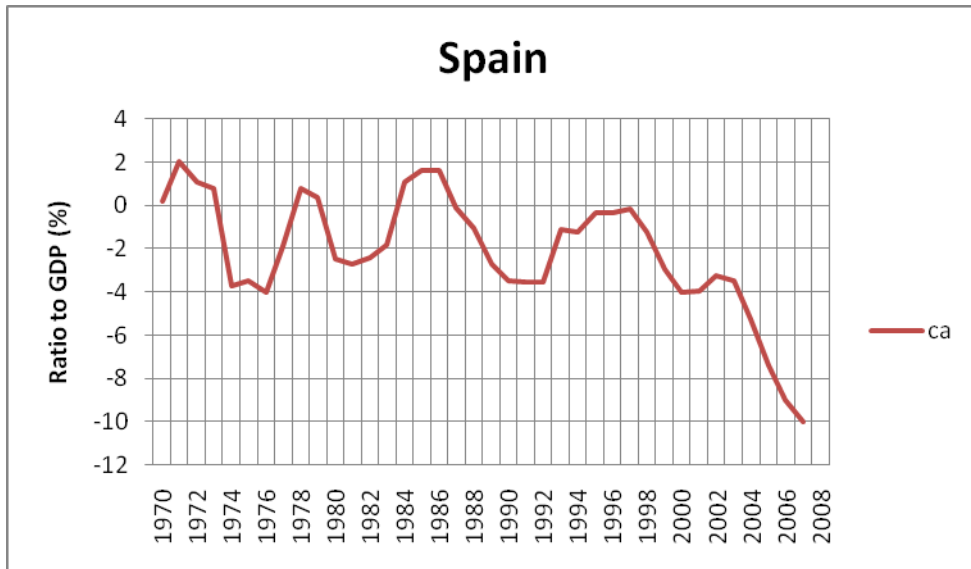
**Figure 1**  
**Current account (percentage of GDP)**



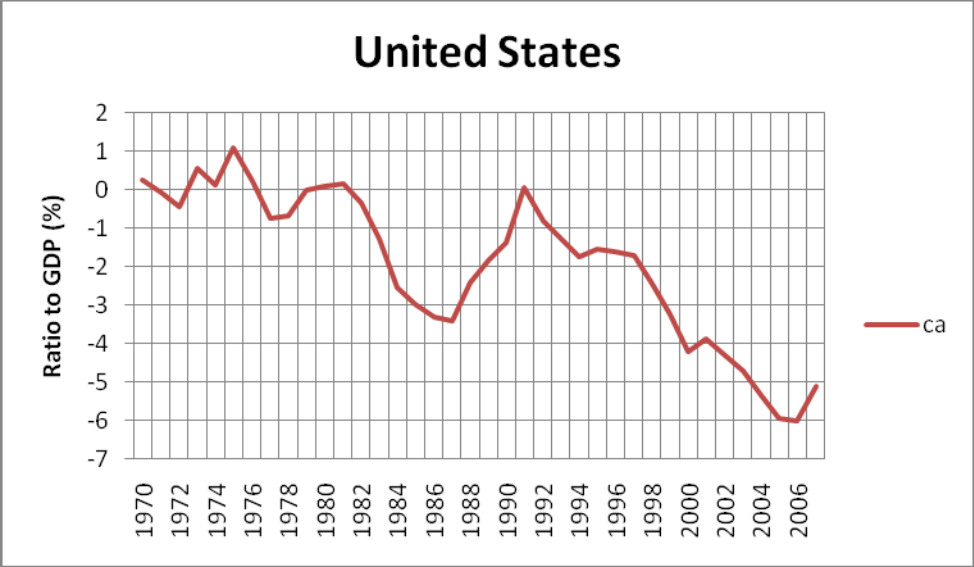












**Table 1**  
**Ng-Perron tests for unit roots**

I(2) vs. I(1)

	Australia		Austria		Canada		Greece		Ireland		Italy	
	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$
$\Delta nfa_t$	-17.90***	-2.96***	-17.93***	-2.93***	-17.28***	-2.90***	-15.18***	-2.54***	-17.98***	-2.95***	-17.92***	-2.98***
$\Delta exp_t$	-17.95***	-2.99***	-16.40***	-2.80***	-12.64***	-2.50***	-17.08***	-2.92***	-15.53***	-2.78***	-17.94***	-2.97***
$\Delta imp_t$	-17.84***	-2.94***	-17.58***	-2.95***	-16.60***	-2.86***	-16.90***	-2.85***	-17.70***	-2.97***	-17.69***	-2.96***

	New Zealand		Portugal		Spain		United Kingdom		United States	
	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$
$\Delta nfa_t$	-17.07***	-2.91***	-11.31***	-2.26**	-14.60***	-2.45**	-17.96***	-2.92***	-16.98***	-2.88***
$\Delta exp_t$	-17.45***	-2.95***	-15.66***	-2.78***	-13.88***	-2.63***	-17.99***	-2.94***	-14.05***	-2.59***
$\Delta imp_t$	-17.80***	-2.98***	-16.86***	-2.90***	-16.77***	-2.86***	-17.97***	-2.93***	-17.38***	-2.93***

I(1) vs. I(0)

	Australia		Austria		Canada		Greece		Ireland		Italy	
	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$
$nfa_t$	-10.57	-2.28	-13.32	-2.55	-1.37	-0.58	-1.59	-0.60	-4.40	-1.48	-10.19	-2.15
$exp_t$	-12.91	-2.54	-0.98	-0.36	-3.13	-1.10	-6.02	-1.72	-4.57	-1.35	-5.78	-1.65
$imp_t$	-16.85*	-2.87*	-4.95	-1.37	-4.19	-1.23	-6.06	-1.61	-7.29	-1.87	-7.83	-1.87

	New Zealand		Portugal		Spain		United Kingdom		United States	
	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$	$MZ_{\alpha}^{GLS}$	$MZ_t^{GLS}$
$nfa_t$	-5.28	-1.56	-1.13	-0.49	1.78	0.54	-5.12	-1.56	-4.34	-1.47
$exp_t$	-9.31	-2.07	-7.00	-1.85	-4.57	-1.50	-8.19	-2.01	-6.13	-1.74
$imp_t$	-11.91	-2.43	-11.11	-2.33	-5.92	-1.57	-11.65	-2.40	-11.88	-2.39

Notes:

- (i) \*\* and \*\*\* denote significance at the 5% and 1% levels, respectively. The critical values are taken from Ng and Perron (2001), Table I.
- (ii) The autoregressive truncation lag has been selected using the modified Akaike information criterion, as proposed by Perron and Ng (1996).

**Table 2**  
**Estimation of long-run nonlinear relationships between net exports and net foreign assets**

	Long-run coefficient	Error-correction coefficient
Australia	0.02 <sup>***</sup> (4.35)	-0.74 <sup>***</sup> (-4.20)
Austria	-0.40 <sup>***</sup> (-6.26)	-0.50 <sup>***</sup> (-3.54)
Canada	-0.27 <sup>**</sup> (-2.37)	-0.21 <sup>**</sup> (-2.26)
Greece	0.03 (0.58)	-0.20 <sup>*</sup> (-1.70)
Ireland	-0.12 (-0.48)	-0.07 (-1.58)
Italy	-0.15 <sup>***</sup> (-2.65)	-0.44 <sup>***</sup> (-3.68)
New Zealand	-0.05 <sup>***</sup> (-2.85)	-0.76 <sup>***</sup> (-4.46)
Portugal	0.19 <sup>***</sup> (2.44)	-0.14 <sup>**</sup> (-1.97)
Spain	0.11 <sup>***</sup> (3.90)	-0.47 <sup>***</sup> (-3.30)
United Kingdom	0.03 (0.69)	-0.35 <sup>**</sup> (-2.45)
United States	0.13 <sup>**</sup> (2.21)	-0.20 <sup>**</sup> (-2.11)

Notes:

- (i)  $t$ -statistics in parentheses.  
(ii) \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.