Empirica (2020) 47:267–280
https://doi.org/10.1007/s10663-018-9415-9

ORIGINAL PAPER

Fiscal policy and the real exchange rate: some evidence from Spain

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Published online: 29 August 2018

Abstract
The factors influencing the real exchange rate are an important issue for a country's price competitiveness, which is especially relevant to those countries belonging to a monetary union. In this paper, we analyse the relationship between fiscal policy and the real exchange rate for the case of Spain. In particular, we explore how changes in government spending, differentiating between consumption and investment, can affect the long-run evolution of the real exchange rate vis-à-vis the euro area. The distinction between two alternative definitions of the real exchange rate, based on consumption price indices and export prices, respectively, will also prove to be relevant for the results.

Keywords Real exchange rate · Government consumption · Government investment

JEL Classification E62 · F31 · F41

1 Introduction

The factors influencing the real exchange rate are an important issue for a country's price competitiveness. In addition, assessing the movements of the real exchange rate is still important for a country joining a monetary union, such as,

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e.g., the Economic and Monetary Union (EMU) in the European Union (EU), because they reflect the evolution of inflation differentials versus other countries. Since fiscal policy is the main tool of stabilisation policy available to individual countries in a monetary union, the links between fiscal policy and the real exchange rate become particularly relevant. However, although there is an extensive literature dealing with the macroeconomic effects of fiscal shocks (to name a few, Blanchard and Perotti 2002; Marcellino 2006; Mountford and Uhlig 2009; Afonso and Sousa 2012; Burriel et al. 2010), most of these papers fail to assess their impact on real exchange rates.

On the other hand, one of the most visible consequences of the current economic and financial crisis is a great increase in government deficits. This is the case of Spain, a country that had enjoyed a government deficit lower than in the euro area since the start of EMU in 1999. However, as the figures in Table 1 show, the Spanish public budget moved in two years (2007–2009) from a surplus of almost 2%, in terms of GDP, to a deficit above 10%, with the ratio of government debt to GDP more than doubling in the last 5 years. As a result, and given the commitments under the EU's Pact for Stability and Growth, the Spanish authorities have implemented a series of consolidation measures. These measures have involved cuts in government expenditure, mostly on education, health and social welfare, as well as on the compensation of government employees; together with increases in the rates of the value added tax and some changes in the regulation of

Table 1 Government expenditure, government revenue, government surplus and government debt in Spain and the euro area, 1999–2016 (% of GDP). *Source*: Eurostat

	Government expenditure		Government revenue		Government surplus		Government debt	
	Spain	Euro area	Spain	Euro area	Spain	Euro area	Spain	Euro area
1999	39.9	47.5	38.6	46.0	−1.3	−1.5	60.9	70.6
2000	39.1	45.7	38.1	45.4	−1.0	−0.3	58.0	68.1
2001	38.5	46.7	37.9	44.7	−0.5	−2.0	54.2	67.0
2002	38.6	46.9	38.2	44.2	−0.4	−2.7	51.3	66.9
2003	38.3	47.3	37.9	44.1	−0.4	−3.2	47.6	68.1
2004	38.7	46.8	38.6	43.8	0.0	−3.0	45.3	68.4
2005	38.3	46.7	39.5	44.1	1.2	−2.6	42.3	69.2
2006	38.3	46.0	40.5	44.6	2.2	−1.5	38.9	67.4
2007	39.0	45.3	40.9	44.7	1.9	−0.6	35.6	65.0
2008	41.1	46.6	36.7	44.4	−4.4	−2.2	39.5	68.6
2009	45.8	50.7	34.8	44.4	−11.0	−6.3	52.8	78.4
2010	45.6	50.5	36.2	44.3	−9.4	−6.2	60.1	83.9
2011	45.8	49.1	36.2	44.9	−9.6	−4.2	69.5	86.1
2012	48.1	49.7	37.6	46.1	−10.5	−3.6	85.7	89.5
2013	45.6	49.7	38.6	46.7	−7.0	−3.0	95.5	91.4
2014	44.9	49.3	38.9	46.7	−6.0	−2.6	100.4	92.0
2015	43.8	48.5	38.6	46.4	−5.1	−2.1	99.8	90.3
2016	42.4	47.8	37.9	46.2	−4.5	−1.5	99.4	89.2

the income tax. The main features of the fiscal consolidation strategies currently followed in the EU are discussed at length in Barrios et al. (2010). As in the other Southern European countries, such austerity policies have resulted in a deeper recession (De Grauwe and Ji 2013).

Analysing the Spanish case can be relevant, as a good example of a fiscal adjustment that has led to a large GDP fall. Also, and unlike other peripheral European countries (such as Greece, Ireland and Portugal) that had no access to normal market financing and were obliged to implement the adjustment policies imposed by the IMF and the EU, Spain was able to choose the composition of the adjustment measures. In short, a sudden and huge increase in the government deficit, a consolidation strategy that has intensified the recession in the context of a severe financial crisis, and the ability of the authorities to choose the composition of the fiscal adjustment measures (unlike the cases of Greece, Ireland and Portugal) make Spain an appealing case study when it comes to analyse the economic effects of fiscal consolidation. In addition, the Spanish experience could be of interest for those Central and Eastern European countries that are expected to join the eurozone in the next future.

The implications of these fiscal consolidation measures on external competitiveness have not been the subject of much empirical research, however; and this despite being of a crucial importance for small open economies such as Spain, suffering the deepest recession in decades. Regarding the Spanish case, there are some studies available on the general effects of fiscal policies. For instance, the impact of fiscal policy changes on the main macroeconomic variables under a VAR framework has been explored in De Castro (2006) and De Castro and Hernández de Cos (2008); and the long-run sustainability of budget deficits when fiscal policy is conducted as a non-linear process, is analysed in Bajo-Rubio et al. (2004, 2006). As far as we know, the only paper that has examined the effects of government spending on the real exchange rate is De Castro and Fernández (2013), who make use of the VAR methodology; unlike this paper, where we estimate an econometric model based on theoretical considerations (see below). Notice that in De Castro and Fernández (2013) the sample period ended at 2008, i.e., just before the start of the crisis, and the real exchange rate was computed only in terms of consumer prices.

In this paper, we will analyse the relationship between fiscal policy and the real exchange rate, from the estimation of an economic model using econometric methods, for the case of Spain. In particular, we will explore how changes in government spending, differentiating between consumption and investment, can affect the long-run evolution of the real exchange rate vis-à-vis the euro area. Unlike most of the available empirical literature, which concentrates on a single measure of the real exchange rate (usually, that based on the consumption price index, CPI), we will differentiate between two alternative definitions of this variable, namely, the real exchange rate computed using CPIs and the real exchange rate computed using export prices, since they can reveal a different story regarding the competitiveness of a particular country. Also, our sample extends until the end of 2016, i.e., including the crisis period. In this way, we would be able to assess the potential implications of the recently implemented fiscal consolidation measures on external competitiveness. In the rest of the paper, we discuss the underlying theoretical framework in Sect. 2, and present the empirical results in Sect. 3; Sect. 4 concludes.

2 Theoretical framework

As mentioned above, there are a number of papers analysing how changes in government expenditure affect the real exchange rate, as a by-product of the literature on the macroeconomic effects of fiscal policy. On the theoretical side, most models predict a real exchange rate appreciation following an increase in government spending. For instance, in the traditional Mundell–Fleming model a higher government spending raises interest rates, which results in higher capital inflows that entail a nominal and real exchange rate appreciation. From another point of view, since government spending is mostly concentrated on home-produced goods, the resulting increase in the demand for nontradables relative to imported goods, also leads to a real exchange rate appreciation. This is the result obtained in a series of empirical papers; see, among others, Froot and Rogoff (1991), De Gregorio et al. (1994), Chinn (1999), Galstyan and Lane (2009a, b), De Castro and Fernández (2013), Ricci et al. (2013), Bénétrix and Lane (2013), Çebi and Çulha (2014) or De Castro and Garrote (2015).

However, other empirical studies have found the opposite result, i.e., a higher government spending leading to a real exchange rate depreciation, instead of an appreciation; see, e.g., Kim and Roubini (2008), Monacelli and Perotti (2010), Kollmann (2010), Enders et al. (2011) or Ravn et al. (2012). This outcome has been rationalised in terms of the model of Obstfeld and Rogoff (1995): a rise in government spending would lead to a fall in private consumption that reduces money demand and, insofar as prices are sticky, depreciates the nominal and real exchange rate.

The above results refer to government consumption. However, as discussed by Galstyan and Lane (2009a), the composition of government expenditures could have a differential impact on the long-run behaviour of the real exchange rate. In particular, an increase in government investment would have an ambiguous effect on the real exchange rate. Since, as these authors claim, an expansion in the public capital stock may be expected to enhance productivity, if this increase in productivity goes mostly to the tradables sector the real exchange rate would appreciate according to the Balassa-Samuelson mechanism (see Balassa 1964; Samuelson 1964). On the contrary, if the increase in government investment raises productivity in the non-tradables sector a real exchange rate depreciation would appear. The latter result, i.e., a real depreciation following an increase in government investment, is obtained by Galstyan and Lane (2009a, b). Other authors, however, such as De Castro and Fernández (2013), Bénétrix and Lane (2013) and De Castro and Garrote (2015) found the opposite, i.e., a real appreciation as a result of a higher government investment; whereas Çebi and Çulha (2014) obtained an insignificant effect of government investment on the real exchange rate. Finally, we will mention the more recent contribution of Chatterjee and Mursagulov (2016), who found a non-monotonic U-shaped adjustment (i.e., an initial depreciation followed by an appreciation) of the real exchange rate in response to a positive shock to government investment, with this effect depending on several factors, such as the composition of public spending, the underlying financing policy, the intensity of private capital in production, or the relative productivity of public investment.

In this paper, we will follow Galstyan and Lane (2009a) and estimate an equation for the real exchange rate of Spain vis-à-vis the euro area, where the latter will be made to depend, in addition to government consumption and investment, on two other variables. First, we have incorporated the role of the trade balance, so that an increase in consumption will translate into both a trade deficit and an increased demand for nontradables, which would lead to a real exchange rate appreciation. In addition, we have also included in the empirical model the variable GDP per capita: assuming non-homothetic tastes, countries with higher real per capita income will enjoy a stronger demand for nontradables relative to tradables, leading to a real exchange rate appreciation (Bergstrand 1991).

3 Empirical results

The State Secretariat for Trade at the Spanish Ministry of Economy, Industry and Competitiveness, computes a series of price competitiveness indices, i.e., the so called "índices de tendencia de competitividad" or trend of competitiveness indices (Ministerio de Economía, Industria y Competitividad, 2017). These indices are real effective exchange rates, computed for several geographic areas and using two different price indicators, namely, the CPI and an index of export prices. Notice that CPIs include goods that are not tradable abroad, so their evolution may reflect domestic demand pressures. In contrast, export prices involve solely the evolution of the prices of those goods that face international competition, i.e., tradable goods. These trend of competitiveness indices are available on a monthly basis, and are built so that an increase (decrease) means an appreciation (depreciation) of the real exchange rate and, hence, a worsening (improvement) of the economy's external competitiveness vis-à-vis the group of countries analysed.

Figures 1 and 2 show the evolution of the trend of competitiveness indices vis-à-vis the euro area, computed using the CPI and export prices, respectively, from 1995 on. As can be seen, when CPIs are used (Fig. 1), the Spanish economy underwent a continuous loss of competitiveness along the period, due to a higher relative increase in Spanish prices. However, when export prices are used (Fig. 2), the conclusions are significantly changed, since the loss of competitiveness is much more nuanced, i.e., the appreciation of the real exchange rate is now much lower because the prices of Spanish exports would have experienced a lower relative increase as compared with total prices, measured by the CPI. In other words, the higher relative increase in Spanish prices would be mostly explained by the evolution of the prices of nontradables, which do not face competition in international markets, rather than the prices of internationally traded goods. This in turn would point to the existence of a "dual inflation" in the Spanish economy (Estrada and López-Salido 2004), and might help to explain to some extent the rather satisfactory evolution of Spanish exports despite the crisis (Myro 2013).

In the rest of this section, we will present the results of the econometric estimation of a dynamic long-run equation such as:

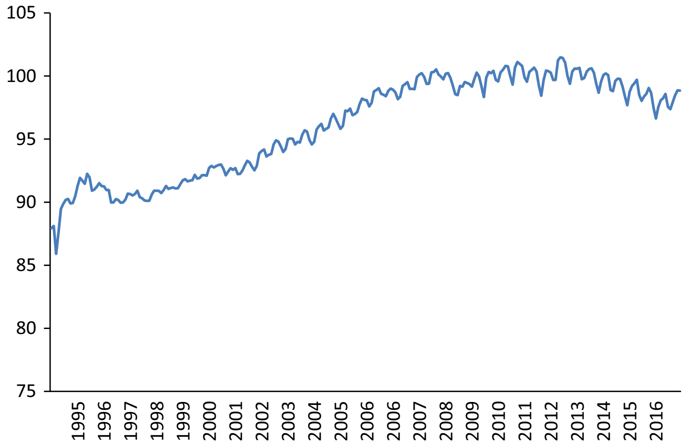

Fig. 1 Trend of competitiveness index computed using consumption price indices, vis-à-vis the euro area, 1995–2016 (2010 = 100). *Source*: Ministry of Economy and Competitiveness

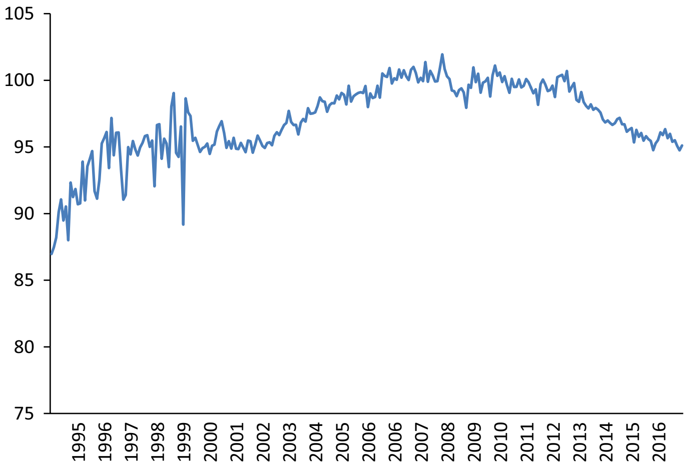

Fig. 2 Trend of competitiveness index computed using export prices, vis-à-vis the euro area, 1995–2016 (2010 = 100). *Source*: Ministry of Economy and Competitiveness

$$
\begin{aligned}
LREER_t = {} & \text{constant} + \alpha\, RELGOVCONS_t + \beta\, RELGOVINV_t + \gamma\, TB_t \\
& + \theta\, LRELYPC_t + \sum_{j=-q}^{q} \alpha_j \Delta RELGOVCONS_{t-1-j} \\
& + \sum_{j=-q}^{q} \beta_j \Delta RELGOVINV_{t-1-j} + \sum_{j=-q}^{q} \gamma_j \Delta TB_{t-1-j} \\
& + \sum_{j=-q}^{q} \theta_j \Delta LRELYPC_{t-1-j} + \nu_t
\end{aligned}
$$

This equation follows from the steady-state solution of the two-sector small open-economy model in Obstfeld and Rogoff (1996); see Galstyan and Lane (2009a) for details. Notice that this approach has the advantage, compared to the VAR analysis, of being based on an economic theory framework. The econometric estimation has been made using the method of Dynamic Ordinary Least Squares (DOLS) of Stock and Watson (1993) with the methodology of Shin (1994), which corrects the possible presence of both endogeneity in the explanatory variables, and serial correlation in the error terms of the OLS estimation.

The variables in the above equation are defined as follows:

- *LREER* = (logarithm of the) real effective exchange rate of Spain vis-à-vis the euro area (where an increase in this variable means an appreciation of the real exchange rate)
- *RELGOVCONS* = relative government consumption over GDP, i.e., ratio of government consumption to GDP of Spain divided by ratio of government consumption to GDP of the euro area
- *RELGOVINV* = relative government investment over GDP, i.e., ratio of government investment to GDP of Spain divided by ratio of government investment to GDP of the euro area
- *TB* = Spain's trade balance over GDP
- *LRELYPC* = (logarithm of the) relative real GDP per capita, i.e., real GDP per capita of Spain divided by real GDP per capita of the euro area

where Δ is the first difference operator, and ν_t is an error term. As mentioned before, the relative variables have been computed as the variable for Spain divided by the same variable for the euro area (defined as the 19 countries that have currently adopted the euro), which explained around half of the Spanish trade in 2016. We will consider two real exchange rates, according to the price index used in their calculation, namely, the CPI or export prices, denoted as *LREER_CPI* and *LREER_EXP*, respectively. These two variables come from the database of the Spanish Ministry of Economy, Industry and Competitiveness; whereas the rest of the data have been taken from Datastream, except for the Spanish trade balance, taken from the Bank of Spain. Some descriptive statistics for the above variables are shown in Table 2. All variables are seasonally adjusted, and the sample period is 1995:1–2016:4.

Finally, in order to check the robustness of our results, we have also incorporated into the basic model an additional variable, namely, the terms of trade, which should be positively related to the real effective exchange rate (REER); see Galstyan and Lane (2009b). This variable has been measured as:

- *LToT* = (logarithm of) Spain's terms of trade, i.e., price index of exports divided by price index of imports

and the data have been taken from Eurostat.

As a first step of the analysis, we tested for the order of integration of the variables by means of two alternative tests. First, the Phillips–Perron test (Phillips and Perron 1988), which corrects non-parametrically the possible presence of

Table 2 Descriptive statistics

	LREER_CPI	*LREER_EXP*	*RELGOVCONS*	*RELGOVINV*	*TB*	*LRELYPC*	*LToT*
Mean	4.564	4.575	0.895	1.155	−0.046	−0.215	4.586
Median	4.580	4.573	0.875	1.230	−0.044	−0.215	4.585
Maximum	4.618	4.617	0.981	1.414	−0.006	−0.167	4.701
Minimum	4.469	4.472	0.833	0.703	−0.093	−0.270	4.508
Standard deviation	0.041	0.029	0.043	0.219	0.023	0.031	0.039
Skewness	−0.440	−0.886	0.402	−1.024	−0.341	−0.108	0.405
Kurtosis	1.733	3.971	1.719	2.633	2.101	1.626	3.210

autocorrelation in the standard Dickey–Fuller test, under the null hypothesis that the variable has a unit root. And, second, given the small power of this test under certain stochastic properties of the series, we also present the results of the KPSS test (Kwiatkowski et al. 1992), under the null hypothesis of stationarity. According to the results shown in Table 3, for the Phillips–Perron test the null hypothesis of a unit root was not rejected in most cases, at the same time that the null of a second unit root was always rejected; in turn, for the KPSS test, the null hypothesis of stationarity was always rejected.

The results of the econometric estimation of our long-run equation for the two real exchange rates, appear in Table 4. The number of leads and lags for the first-differentiated variables has been selected as $INT(T^{1/3})$, being T the number of observations (Stock and Watson 1993); the chosen number of leads and lags was four. Cointegration is tested using C_{μ}, an LM statistic from the DOLS residuals (Shin 1994); in particular, we are testing for deterministic cointegration, i.e., when there is no trend in the regression equation.

Looking at the first two columns, which show the results for our basic model, we can see first that the null of deterministic cointegration is not rejected in the two cases at the 1% level of significance, so the existence of a long-run relationship between the real exchange rate and the right-hand side variables would be supported by the data.[1] Turning now to the estimated coefficients, we can see how a decrease in government consumption, relative to the euro area, would lead to a depreciation of the real exchange rate, both in terms of the CPI and export prices, on decreasing the demand for nontradables. On the other hand, if fiscal consolidation takes the form of a reduction in government investment, the real exchange rate would appreciate in terms of the CPI but depreciate in terms of export prices. This would indicate a greater effect of the fall in government investment on the productivity of tradables rather than nontradables (in line with the Balassa–Samuelson effect) leading to a depreciation of the REER measured with export prices,

[1] The critical values for the C_{μ} statistic are 0.208, 0.121 and 0.094, at the 1%, 5% and 10% significance levels, respectively; and are taken from Shin (1994), Table 1, for $m=4$.

Table 3 Unit root tests

	$Z(t_{\tilde{\alpha}})$	$Z(t_{\alpha^*})$	$Z(t_{\hat{\alpha}})$
(A) Phillips–Perron test			
I(2) versus I(1)			
$\Delta LREER\_CPI_t$	-17.774^a	-16.580^a	-15.479^a
$\Delta LREER\_EXP_t$	-17.285^a	-15.126^a	-15.084^a
$\Delta RELGOVCONS_t$	-12.155^a	-12.219^a	-12.277^a
$\Delta RELGOVINV_t$	-4.558^a	-4.581^a	-4.503^a
ΔTB_t	-8.214^a	-8.170^a	-8.213^a
$\Delta LRELYPC_t$	-7.297^a	-7.140^a	-7.072^a
$\Delta LToT_t$	-40.461^a	-38.766^a	-39.583^a
I(1) versus I(0)			
$LREER\_CPI_t$	-2.374	-3.520^a	2.237
$LREER\_EXP_t$	-2.988	-3.712^a	0.831
$RELGOVCONS_t$	-1.725	-1.282	0.252
$RELGOVINV_t$	-1.218	-0.559	-1.233
TB_t	-1.555	-1.253	-0.692
$LRELYPC_t$	-1.638	-1.817	-1.117
$LToT_t$	-9.244^a	-8.986^a	0.465

	η_μ	η_τ
(B) KPSS test		
$LREER\_CPI_t$	0.274^b	1.078^a
$LREER\_EXP_t$	0.290^a	0.693^b
$RELGOVCONS_t$	0.150^b	0.891^a
$RELGOVINV_t$	0.219^a	0.538^b
TB_t	0.257^a	0.318
$LRELYPC_t$	0.259^b	0.269
$LToT_t$	0.214^b	0.377^c

(1) $Z(t_{\tilde{\alpha}})$, $Z(t_{\alpha^*})$ and $Z(t_{\hat{\alpha}})$ are the Phillips–Perron statistics with drift and trend, with drift, and without drift, respectively; and η_μ and η_τ are the KPSS statistics with trend, and without trend, respectively

(2) [a] and [b] denote significance at the 1% and 5% levels, respectively. The critical values for the Phillips–Perron test (at the 1% and 5% levels, respectively) are -4.067 and -3.462 for $Z(t_{\tilde{\alpha}})$; -3.507 and -2.895 for $Z(t_{\alpha^*})$; and -2.592 and -1.945 for $Z(t_{\hat{\alpha}})$. The critical values for the KPSS test (at the 1% and 5% levels, respectively) are 0.216 and 0.146 for η_μ; and 0.739 and 0.463 for η_τ. The sources of the critical values are MacKinnon (1996) for the Phillips–Perron test and Kwiatkowski et al. (1992, Table 1) for the KPSS test

but not strong enough to depreciate the REER in terms of the CPI too; this result, however, is estimated with a very small coefficient.

As regards the other two variables, the coefficient on the trade balance appears in the estimation with the expected sign, but is only significant (at the 10% level) for the REER measured with export prices. In turn, we found that a higher real

Table 4 Long-run determinants of the real exchange rate: Stock–Watson–Shin cointegration tests

	LREER_CPI	*LREER_EXP*	*LREER_CPI*	*LREER_EXP*
Constant	4.076[a]	3.895[a]	4.186[a]	2.100[c]
	(24.281)	(22.894)	(2.727)	(1.774)
RELGOVCONS	0.823[a]	0.763[a]	0.618[a]	0.632[a]
	(5.222)	(4.776)	(2.896)	(3.837)
RELGOVINV	−0.054[c]	0.067[b]	−0.081[c]	0.020
	(1.928)	(2.355)	(1.672)	(0.555)
TB	−0.079	−0.316[c]	−0.093	−0.501[a]
	(0.464)	(1.818)	(0.392)	(2.716)
LRELYPC	0.880[a]	0.451[a]	0.809[a]	0.308[a]
	(7.761)	(3.928)	(5.231)	(2.585)
LToT	–	–	0.019	0.420
			(0.055)	(1.585)
R^2	0.976	0.999	0.983	0.971
C_μ	0.086	0.063	0.086	0.047

(1) *t*-statistics in parentheses

(2) [a,b] and [c] denote significance at the 1%, 5% and 10% levels, respectively

per capita income relative to the euro area, by increasing the relative demand of nontradables, would lead to an unambiguous appreciation of the real exchange rate.

Finally, in the last two columns of Table 4 we include the variable terms of trade. The null of deterministic cointegration is again not rejected, although now at the 5% level of significance for the CPI-based REER.[2] Compared with the results of our basic model, the results are very similar, except for the coefficient on government investment, which loses its significance in the equation for the REER measured using export prices. However, the coefficient on the terms of the trade, although appearing with the expected sign, is not significant in both equations.

If we compare the results of this paper with those of De Castro and Fernández (2013) making use of VAR analysis, these authors found that an increase in government spending appreciated the REER (i.e., a positively-signed relationship between both variables). However, when separating the whole government spending into expenditure on goods and services, personnel expenditure and public investment, the overall result, i.e., a REER appreciation, still held in the first and last cases; unlike the second case, for which a REER depreciation resulted instead. Recall that these authors only used the CPI-based definition of the REER, and their sample period ended at 2008, i.e., just before the start of the crisis. In this paper, we can confirm their results for the case of government consumption; unlike government investment, where the opposite result (i.e., a negatively-signed relationship) was found. However, the relation between government investment and the REER became positively-signed when the latter was measured in terms of export prices.

[2] The critical values for the C_μ statistic are now 0.158, 0.097 and 0.075, at the 1%, 5% and 10% significance levels, respectively; see Shin (1994), Table 1, for $m=5$.

Table 5 Kejriwal–Perron tests for structural change

	sup $F_T(1)$	sup $F_T(2)$	sup $F_T(3)$	*UD* max	Number of breaks selected
LREER_CPI	9.95	7.90	6.15	9.95	0
LREER_EXP	8.70	7.20	5.17	8.70	0

No test statistic is significant at the conventional levels. The critical values are taken from Kejriwal and Perron (2010), Table 1.10, trending case

Finally, since our sample includes the crisis period, we have analysed the possible existence of a structural change in the estimated equations, associated with the crisis. To this end, we have made use of the approach of Kejriwal and Perron (2008, 2010) that tests for multiple structural changes in cointegrated regression models. In particular, these authors develop three types of test statistics: (1) a sup-Wald test of the null hypothesis of no structural break versus the alternative of a fixed (arbitrary) number of breaks *k*; (2) a test of the null hypothesis of no structural break versus the alternative of an unknown number of breaks, given some upper bound; and (3) a sequential test of the null hypothesis of *k* breaks versus the alternative of $k+1$ breaks.

The results of applying the Kejriwal–Perron tests to the estimated equations of our basic model, i.e., those in the first two columns of Table 4, are shown in Table 5. Due to the small length of our sample period, we have allowed up to two breaks under the alternative hypothesis. None of the tests proves to be significant and the sequential procedure selects no break point. A possible explanation to the failure to find any structural change might be that the potential candidate dates (i.e., the crisis period) are located at the very end of the sample, leaving an insufficient number of observations available.

4 Concluding remarks

The factors influencing the real exchange rate are an important issue for a country's price competitiveness. This matters particularly to those countries belonging to a monetary union, for which the real exchange rate reflects inflation differentials vis-à-vis the rest of the world once their nominal exchange rates have been lost. In addition, since fiscal policy is the main tool of stabilisation policy available to individual countries in a monetary union, the links between fiscal policy and the real exchange rate become highly relevant.

In this paper, we have analysed the relationship between fiscal policy and the real exchange rate for the case of Spain. As many of the countries participating in EMU, and following a sudden and strong increase in government deficits, the Spanish authorities have implemented a series of fiscal consolidation measures, given the commitments within the EU under the Pact for Stability and Growth. The Spanish case looks mostly relevant because it is a good example of a fiscal adjustment that has led to a large GDP fall; however, and unlike the cases of Greece, Ireland and Portugal, the Spanish authorities were able to choose the composition of the adjustment measures. The Spanish experience could also be of interest for those Central and Eastern European countries that are expected to join the eurozone in the next future. In particular, we have explored how changes in government spending, differentiating between consumption and investment, can affect the long-run evolution of the real exchange rate vis-à-vis the euro area. Moreover, and unlike most of the available empirical literature, we have dealt with two alternative definitions of the real exchange rate, namely, CPI-based and based on export prices, since they can reveal a different story regarding the competitiveness of a particular country.

Our results show that the composition of the fiscal consolidation measures matters as regards their effect on external competitiveness, but the definition of the real exchange rate also matters. A decrease in government consumption, relative to the euro area, would cause a depreciation of the real exchange rate, computed using both CPIs and export prices. A decrease in government investment, in turn, would lead to an appreciation of the CPI-based real exchange rate, but to a depreciation of the real exchange rate based on export prices; the estimated effect, however, is not quantitatively too high in both cases. In addition, a worsening of the trade balance and, especially, a higher real per capita income relative to the euro area, would also lead to an appreciation of the real exchange rate. Finally, since our sample includes the crisis period, we have tested for the possible presence of structural change in the estimated equations, but no evidence has been found of any significant structural break throughout the whole period.

To conclude, and as the main policy implication of our results, both the way in which fiscal consolidation is achieved (i.e., whether based mostly on cuts in government consumption or in government investment), and how the real exchange rate is defined, seem to matter as regards the effects of a particular fiscal consolidation strategy on the real exchange rate, and hence on price competitiveness.

Acknowledgements Funding was provided by Ministerio de Economía y Competitividad (ES) through Grants No. ECO2016-78422-R (O. Bajo-Rubio) and No. ECO2017-83255-C3-3-P (V. Esteve).

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