

In search of the Iberian business cycle: endogenous fiscal policy and the changing nature of the state, 1945-2000

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ABSTRACT

Both fiscally responsible and irresponsible governments may have fiscal reaction functions which reduce or increase the amplitude and duration of business cycles. This, we suggest, is the key to the pattern of Iberian fluctuations in economic activity since 1945. Underlying these functions are political settlements or their absence; Traumatic political histories or shocks destroy the basis for stabilising fiscal policies. Stability, political ingenuity and luck can create this basis. Whereas in Spain, the ministers behind the 1959 Stabilisation Plan managed eventually to tame the excesses of a militarily directed economy, and the dictator ensured a transition that kept the army's loyalty, the opposite path was followed in Portugal. Fiscal prudence allowed authoritarian Portugal to match Spain's spectacular growth rates of the 1950s and 1960s without economic crises, but failure to secure the army prevented a smooth transition from dictatorship. In consequence Portugal experienced more extreme downturns and budgetary policies than Spain after 2000, and the Maastricht/EMU shocks. The two countries followed crossing paths. Macroeconomic instability prevailed in Spain under at least the early Franco, whereas smoothed adjustments (in spite of stronger external shocks) characterized the economy after the democratic transition. The reverse can be observed in Portugal, where macroeconomic stability under the Estado Novo gave way to dramatic fluctuations after the 1974 revolution.

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Both Iberian economies avoided the Second World War and were ruled by authoritarian regimes for a generation afterwards. They were much slower than the rest of Western Europe to liberalise after the autarkic years up to 1945. Nonetheless by the 1960s both were experiencing unprecedented economic growth. In the following decades, as well as economic shocks, often common to other Western European countries (oil prices, technological and financial innovation) and changes in economic policy (exchange rate regimes, monetary and fiscal discipline, accession to EEC), Spain and Portugal were subject to massive political changes.

The nature and consequences of these political transformations for the two economies were quite different, however, as their business cyclical behaviour reveals. Indeed business cycle history shows strong contrasts between the economic and political stability of the apparently similar Iberian regimes. In particular the contention of the present paper is that there was a ‘fiscal crossover’. One country’s undisciplined fiscal policy at first generated volatile cycles in economic activity but eventually reached a political equilibrium, which permitted cycles of much lower amplitude. The other economy moved in the opposite direction, from stability to volatility, in contrast to the ‘Great Moderation’ elsewhere.

Portuguese business cycles are under-investigated, though one study at least is among the most technically advanced. Correia et al (1995) construct and calibrate a small open economy model of Portugal and parameterise it with annual data 1958-1991. They find that their model is unable to mimic actual business cycle fluctuations when driven solely by shocks to government expenditures or to foreign transfers. Shocks to productivity (or to the terms of trade) are necessary in order to generate empirically recognizable business cycles. One of these shocks constitutes what we will maintain is a fundamental regime change, the revolution of April 1974.

Business cycle research on Spain is more abundant. Spanish studies normally adopt a “growth cycles” approach (using alternative detrending techniques to identify

fluctuations) and focus almost exclusively on the period from the early 1970s to the early 1990s. For the economy between 1976 and 1998, Gimenez and Martin-Moreno (2002) conclude that the introduction into their real business cycle model of both a liquidity constraint and a monetary growth rate shock are critical to explain the post-Franco Spanish economy. Other studies identify the specific characteristics of Spanish economic fluctuations as compared to major trade partners—for instance, a lower volatility of real output (interpreted as a consequence of extensive state control and regulation), and an unusually higher volatility of external balance than real output (explained by the increasing openness of the economy) (Dolado et al. 1993, Ortega 1998). They also document the increasingly synchronous movement of the Spanish business cycle with the rest of major trade partners as the process of trade and financial integration and policy coordination advanced (Ortega 1998, Fatas 1999, Herrero and Ruiz 2005).

None of these studies attempt to address in depth the possible contribution of regime change to the business cycle after 1945. The present paper aims to deepen the understanding of the Iberian business cycles in a longer and more encompassing perspective, which covers the entire second half of the 20th century. Data for Spain, Portugal and their major trade partners are from OECD and IMF statistics, complemented with recent reconstructions of annual macroeconomic data for the Iberian economies (Prados 2003, Santos et al. 1992) (see Data Source Appendix for details).

The strong economic growth for much of the period renders cycle extraction more problematic. The task of section 1 is therefore twofold; to set the institutional scene and to outline the business cycle histories of the two countries to establish the approximate dating of peaks and troughs, as a check upon the pattern established by statistical techniques in section 2. There the evolution of business cycle ‘facts’ in Spain and Portugal before and after the defining moment of the mid-1970s are described and compared. Particular attention is paid to the variability and persistence of the annual output series in order to discover the cycles. In Section 3 cycles in fiscal posture are identified and compared with output to investigate a *prima facie* case that the fiscal policies of the different regimes may be critical. Then in section 4, a more formal analysis specifies and estimates fiscal reaction functions. Section 5 concludes that

differences between economies and within economies over time in volatility of Iberian cycles can be explained by fiscal policy. Fiscal policy in turn was strongly influenced by foreign payments arrangements together with the fiscal base and objectives of the regimes.

1. Cycle History

Iberian cycle history may conveniently be divided into different phases: a first period from the end of the Second World War to 1958-59, characterized in both countries by high and volatile growth, periodically reversed by serious crises: 1949, 1953 and 1959 in Spain; 1948, 1952 and 1958 in Portugal. A second phase of sustained and stable growth—the Golden Age of growth in both countries—began around 1959-60 and lasted until 1974. The duration of the third phase, after the international recession of 1975, is more questionable. For Portugal it might end some time in the 1980s with the unravelling of the revolutionary economic reforms and the introduction of privatisation. For both Spain and Portugal, entry to the EEC in 1986 is certainly a symbolic break with the past, but as we shall see, the economic evidence for a change into a fourth phase at this point, is less clear cut. GDP growth rates of the two countries (Figure 1) and fiscal and monetary policy indicators (Figure 2) provide a first quantitative background of this periodization.

FIGURES 1 AND 2 ABOUT HERE

Phase 1 (1945-1958/59). Structural shortcomings in the Spanish economy were exacerbated by the destruction of the civil war and the economic conditions of Second World War (OECD 1962 27). Three years of drought at the end of the 1940s on top of policy-induced distortions, and famine, constituted a major shock to the Spanish economy at the beginning of the period (Pons Brias 2002 4-5)¹. The first serious postwar crisis hit the Spanish economy in 1949, with a GDP contraction of 0.6 percent, possibly exacerbated by a significant fiscal contraction in 1950 (a 10 percent fall in real primary government expenditure). 1950 GDP per head was still below that of 1947 but inflation fell from 20 percent in 1946 to 7 percent in 1949. After the War Spain neither received Marshall Aid, as did most of Western Europe, nor participated in the early

¹ The general drought however brought prosperity to the villages of the Sierra Nevada where there could never be a serious lack of water (Brenan 1963 314)

stages of OEEC. These exclusions contributed to the autarkic stance of economic policy during the late 1940s and the 1950s. However, triggered by the Cold War the US Export-Import Bank provided substantial long term credit to the Spanish government at the beginning of the 1950, thereby facilitating external financing.

Government policy employed pervasive administrative controls that led to inadequate investment in agriculture, despite the 45% of labour force in the sector, so that heavy industry could be favoured. A major instrument of industrial policy, the Spanish state holding company INI, was modelled on Mussolini's earlier organisation IRI and received massive injections of public funds from the central government budget, which represented the bulk (up to 80 percent) of its external finance until 1957-58 (Schwartz and Gonzalez 1978 76). A second major instrument was the exchange controls and import quotas that had insulated the Spanish economy during the 1930s, coupled with a complex system of multiple exchange rates and binding capital controls. A third instrument was the direction of credit to favoured sectors through the banking system. In spite of pervasive price regulation, Spanish inflation in this first phase was high and erratic. Because it came with a massive inflation jump to 18 and 15 percent in 1950 and 1951 respectively (the Korean War terms of trade shock), the rise in output per head in 1951 above 1947 level was insufficient to prevent strikes in Barcelona and related Cabinet changes. When inflationary pressure seemed to subside, in 1953, a new crisis hit the economy: output fell again slightly (-0.3 percent), although industrial production did not. With expansionary fiscal and monetary policy in 1954-55, soon after the recovery once more inflationary pressures picked up. As inflation reached another peak of 12-13 percent in 1956 and 1957, fuelled by a populist 150 percent increase in nominal wages decreed by the Ministry of Labor, there was an outburst of student troubles, and the dismissal of cabinet ministers (Carreras and Tafunell 2004 319).

Unlike General Franco's Spain, Portugal's Estado Novo adhered to extremely conservative classical economic policies. Salazar was a civilian as well as a former accounting lecturer. The substantial gold reserves accumulated meant that the transmission of shocks was muted until the regime change. Spared from civil war, unlike Spain, but still damaged by the trade disruptions of the Second World War, the Portuguese economy in this first phase 1946-58, pursued a less volatile course with 4.1% gdp average growth and 1.8% average inflation (Neves 1994). On the other hand

there were parallels with Spain's early postwar cycle; real per capita gdp per head reached a temporary peak in 1947 which was not exceeded until 1950. GDP growth stalled in 1948 and then again in 1952 but it was not to do so again until the revolution of 1974.

The stance in monetary policy remained generally restrictive throughout the 1950s, although the regime engaged in mild fiscal expansion in response to the output growth setbacks of 1948 and 1952. During the decade, Portuguese governments adopted an import-substituting industrialisation policy with a focus on manufacturing, directly promoting basic industries. The First Growth Plan 1953-58 was however simply a public investment programme—mainly infrastructure—with no guidelines for the rest of the economy. Price stability and fiscal balance based on moderate tax burden and tight control of expenditures remained the two main pillars of the Salazarist political economy until the early 1960s (Da Silva Lopes 2005). The prudence of the Salazar regime was reflected in a public finance deficit of less than one percent of gdp a year. Despite the strong growth and less erratic performance than Spain, the OECD (1960 23) criticised the minimal expansion of Portuguese exports since 1951 and their lack of variety, complaining that Portuguese 'owners of capital lack spirit of enterprise'. Agricultural improvement was slow and more generally development policy was cautious, with delays in carrying out plans. Portuguese incomes per head on average remained below Spain's. Further criticism was raised by the overly cautious monetary and fiscal stance of the Salazarist regime, which—the OECD reckoned—saved Portugal the setbacks from which Spain had suffered at the cost of keeping the growth rate of the economy lower than the availability of labour and foreign reserves would have allowed (Pintado 1964 190).

Phase 2 (1958/59-1974/75). The second phase of both Spanish and Portuguese growth began with the crises of 1958 (in Portugal, quite mild) and 1959 (in Spain). In the late 1950s Spanish economic policy had created both severe inflation and rapid growth, with massive imports of consumption and capital goods and raw materials, and consequent balance of payments crises. Attempts to prevent crises with multiple exchange rates failed to avoid the virtual elimination of foreign exchange reserves by mid 1959 (Carreras and Tafunell 2004 323-4). Under the Stabilisation Plan of 1959, the peseta was devalued by 43 percent against the US dollar, import licensing controls and

constraints on incoming foreign direct investment were relaxed, and restrictive financial policies were implemented. The reforms were undertaken by technocratic ministers often associated with Opus Dei. According to the IMF (Galy et al 1993), the Plan laid the foundation for subsequent rapid growth. Even if the reforms were eventually successful, the adjustment process to the associated severe recession was long drawn out with little effective offsetting fiscal policy. With the fall in both consumption and investment, GDP growth was negative (-2.3 percent) and industrial production stalled. ‘The stabilisation measures taken in the summer of 1959—the OECD (1962) reckoned—were followed by a period of stagnation of demand and output in 1960. The recovery the following year was gradual and it was only in the last months of 1961 that the movement of re-expansion accelerated’. Fiscal expansion began in 1960, but according to the OECD the public sector did not impact on expansion significantly until the last month of the year and the boost to public expenditure became substantial only with implementation of 1962 budget. Meanwhile guidance given to banks considerably expanded bank credit to the benefit of private demand, possibly encouraged by the reduced discount rate in 1961. Modern statistics of real GDP per head show a slight fall between 1958 and 1959 but strong growth thereafter. The output measure would not fall again until 1981.

An alternative to the IMF view of the Spanish boom of the 1960s, during which gdp per head rose almost 150 percent between 1959 and 1973, is that it is attributable to the buoyancy of world markets, rather than the reforms of 1959 (for example Salmon 1991). The Portuguese economy expanded slightly faster (though within the margin or error of the data we cannot reject the hypothesis that they grew by the amount) without a Stabilisation Plan, but perhaps did not need one in the same way, thanks to Salazarian prudence.

A contributor to Spain’s postwar fiscal challenges was the tax system. Lack of economic information was both a cause and a consequence of the Franco administration’s refusal to determine tax bases. Instead they delegated estimates to trade and professional groups, a system that prompted widespread fraud and evasion (Tamames 1986 211). Estimated income liable for the tax on individuals (Contribucion sobre la Renta) in 1957 was at least double that recorded by the tax authorities (International Bank 1963 117). Consequently to cover an ever increasing public

spending—particularly buoyant in 1965-66, 1968-69 and in 1971—indirect taxation needed to be increased and greater recourse was had to official borrowing. In 1960 63 percent of central administration revenues came from indirect taxes (International Bank 1963 Table 6.3 113). From 1961 a new tariff regime was implemented, as Spain's slow movement to multilateral trade made this form of protection more relevant. Monetary expansion remained sustained (with M1 annual growth rates between 10 and 15 percent, accelerating above 20 percent in 1971-73) and price instability serious, as inflation hit 8, 9 and 10 percent in 1963, 1965 and 1973 respectively. In fact, instruments of monetary policy remained rudimentary: banks' liquidity ratios, in fact mostly ineffective, were introduced in 1963, and reserve requirements only in 1970 (Martin Aceña and Pons Brias 2005 648).

Portuguese expansion in phase two, from 1959, was accompanied by fixed and low interest rates, mainly achieved through a pervasive regulation of the financial sector (Nunes and Valerio 2005 242). Indicating that Portuguese growth could be higher without adverse effects, emigration was significant during the whole period, but especially between 1966-73 when 1.5 percent of the population left the country every year (Neves 1994). Revolt in the African colonies contributed to an economic slow down between 1961-3 because of the sharp rise of military expenditure and the associated fiscal measures (OECD 1966). The rise of government primary expenditures peaked for the first time in 1961 and then again in 1967 and 1970, driven by military expenditures (which reached 7% of GDP) and social security (Da Silva Lopes 2005 273). However, thanks to the expansion of revenues guaranteed by reforms of income and sales taxes, the budget deficit averaged two percent of GDP between 1958 and 1965, falling back to one percent in the second half of the 1960s. Inflation gained momentum in 1966 and 1968, monetary expansion remained moderate throughout the decade. In fact, the OECD continued to criticise Portuguese policy for being insufficiently development minded. Agriculture remained vulnerable with the frequent pattern of poor harvests of cereals and low yields implying that the choice of crops was poorly adapted to the climate, and production improvements were lacking.

Phase 3 (1975-mid 1980s). Africa proved the Novo Estado's Achilles heel, despite quadrupling GDP over the preceding quarter century. Phase three began when Army dissatisfaction with colonial policy ended the regime in April 1974. After the original

hero of the revolution, General Spínola, left for Spain in March 1975, the revolutionary government nationalised banking, the press, transport and steel among other sectors, amounting to one fifth of industry. Directors and managers fled the country, leaving shortfalls in management expertise. When price freezes and legally imposed wage increases bankrupted private sector firms, their state acquisition was financed by cheap credit from state banks (Neves 1994 85). Peasants and tenant farmers were squeezed out of agriculture in the course of expropriating landowners. In November 1975 another coup evicted the Communist-inspired junior officers and the following April Mario Soares became the first elected Portuguese prime minister in half a century (Birmingham 2003 183-193). Combining the revolutionary shock and the impact of the international economic recession triggered by the first oil shock, Portuguese GDP fell by 5 percent in 1975. Naturally the public finances deteriorated during the two revolutionary years; real primary expenditure increased by 25 percent in 1974-75 and the deficit reached 9 percent of GDP in 1976. In addition almost half a million Portuguese returned from Africa between 1973 and 1975, placing a great strain on an already labour-abundant economy. Wages' share in national income increased 10 percentage points. Investment fell and government consumption rose to 15 percent of GDP by 1979, whereas consumer price inflation averaged 24 percent over the period 1974-79.

Despite two agreements with the IMF in 1976 and 1978 on the implementation of austerity plans (possibly too soft, especially when compared to other agreements signed with IMF by Great Britain and Italy: Stallings 1981 118-19) and a devaluation, the public deficit remained high, as the growth rate of expenditures in education, health and social security largely outpaced that of tax revenues (Da Silva Lopes 2005 275). The decision to expand the economy in the face of the second oil shock of 1979 destroyed the external balance and by 1983 the Portuguese government was obliged to adopt another draconian IMF stabilisation programme; real GDP per head fell in 1983 and 1984. Membership of the EC in 1986 coupled with the first one party majority in government since the revolution promised stability.

The turning point of the mid 1970s proved much less dramatic for Spain. Spanish fiscal policy assumed a more expansionary stance in response to the first oil crisis at the end of 1973. It is estimated to have offset two thirds of the contractionary pressure from the

oil price shock (Galy et 1993 4 esp fn 7). With continuous real fiscal expansion since 1976, the budget balance deteriorated and inflation accelerated to 20 percent in 1978. In contrast with Portugal, the political transition was planned by government and did not constitute a shock. The Spanish regime change formally began in 1974 with Arias Navarro's announcement of liberalisation. Franco was taken seriously ill the same year. After the Spanish election of June 1977, the Moncloa Pacts laid the foundation for long overdue fiscal reform (and much else) (Carr 1980 177). A long due fiscal reform Act was also passed later that year. In addition the stabilisation measures of 1977 included a 20 percent devaluation of the peseta against the dollar, more restrictive fiscal and monetary policies, price and wage controls and conferred the right on employers to lay off up to 5 percent of their labour forces. The Bank of Spain's control over liquidity was also extended by establishing effective intermediate targets for monetary aggregates (Martin Aceña and Pons Brias 2005 649).

The second oil shock exacerbated the recession triggered by these measures. The budget balance was increasingly in the red, but monetary policy became restrictive and unemployment began to rise from 8.6 percent in 1979 to 21.5 percent in 1985. As a consequence of other elements of the Moncloa Pacts, despite the tax reform, subsequently public expenditure rose more strongly than revenue. In a decade central government spending climbed from 14 to 24 percent of GDP in Spain (transfers expanded from 5 to 14 percent) compared with an increase from 12 to 35 percent in Portugal. The now democratic Iberian governments engaged in rapid welfare state building, to catch up with North European standards, while revenues lagged behind. This triggered a protracted (ten year) uninterrupted fiscal expansion, well beyond the time horizon of conventional economic cycles.

Phase 4. A fourth phase began in both countries when the fiscal expansion was reversed from 1985-86, coinciding with accession to the EEC. At the same time the EMS gained credibility ("hard EMS") and joining EMS (successfully completed by Spain in 1989 with a 6 percent fluctuation band) became a political priority for both Iberian governments. Capital liberalization was part of the package, but what made a difference was fiscal adjustment and economic policy coordination ("nominal convergence") through pegging the Peseta and Escudo to the DM within the framework of the hard EMS. During the 1986-91 upswing, growth was faster than in principal trading partners,

inflation fell, the budget deficit diminished and employment increased. Nonetheless democracy had permanently installed a larger non-discretionary component of fiscal policy, with welfare state expenditures. Adjustment forced by international coordination was a second discretionary (negative) shock, creating a trough in economic activity in both countries in the mid 1990s. Here we see signs of the emergence of an Iberian business cycle. In 1993 Spanish real income per head fell as well as in Portugal. By contrast in the early 1980s Spain's real income fell first, in 1981, because Portugal's discretionary policy was deferred for two years and exacerbated the downturn.

Lack of a political consensus in Portugal prevented addressing adequately the oversized public sector, tax evasion and the educational system, Portugal increased government employment with lifetime jobs during the recovery of the later 1990s. In the new millennium the economy turned down and Portugal's budget deficit broke the Maastricht treaty level of 3 percent of GDP, by 2005 reaching US levels of 6 percent. Avoiding Portugal's recession, Spain's economy in an unbroken expansion from the mid 1990s, took advantage of low interest rates conferred by the euro, supported by more liberalised labour markets and better infrastructure. The success of Spanish economic growth and the welfare state permitted by a controlled budget could be measured by strong inflows of migrants, particularly from Latin America.

2. Statistical Identification of Cycles

The next step is to create cycle indices for Spain and Portugal. A central problem in identifying a cycle from output time series is the measurement of full capacity output-which defines when a cycle peak is reached. Unemployment is a possible measure of capacity utilisation but is subject to a number of shortcomings, such as under-recording and labour hoarding, as well as changes in the equilibrium rate, that simply shift the problem.

Recent methodological studies demonstrate that business cycles artefacts extracted from different detrending procedures can vary widely and even lead to conflicting results (Canova 1998)². The now standard approach is to filter the output series to extract the

² Moreover, theoretical premises underlying the traditional separation between business cycles and long-run growth (that cycles in industrial economies are recoveries that follow recessions and bring GDP back to trend) have been increasingly questioned in the recent literature (Fatas 2002).

underlying trend, deviations from which of actual output then provide the cycle. In particular for annual data the HP100 filter is conventional³. This can be usefully complemented as a robustness check by a Baxter-King (BK) band-pass filter with standard parameters for the shortest and longest cycle pass (2, 8 years). BK virtually extracts the same cycle as more recent alternatives (e.g. Christiano-Fitzgerald (CF)) as well as a revised HP with 10 or 6.25 smooth parameters (suggested by other studies). One advantage of BK is that it has been designed explicitly for measuring cycle correlation.

Figure 3 shows the cycles obtained from alternative detrending filters (HP100, HP6.5, BK, CF) for the long series of Spanish and Portuguese logGDP (data from Groningen). HP100 is the only one which, as expected, produces significantly different results by eliminating some higher frequency fluctuations and increasing the amplitude of the cycles.

FIGURE 3 ABOUT HERE

Both filters confirm peak volatility in the interwar period (excluding the Spanish civil war). The Bretton Woods years show volatilities comparable to, or lower than the pre-1914 period (Table 1). After about 1971 volatility falls to secular minimum in Spain but increases significantly for Portugal. This peculiarity emerges in Figure 4, which shows time-varying volatility by using a rolling window shifting through the series to compute moments across different subsamples (cf. Blackburn and Ravn 1992 for Britain, Blanchard and Simon 2001 for the US). The window is 7-year centered in the central year.

TABLE 1 AND FIGURE 4 ABOUT HERE

These findings tell a story of crossing paths: high volatility in Spain in the 1950s-60s (low and falling in Portugal), stabilization of the cycle in Spain from the 1970s onwards (apparently unaffected by oil shocks) with amplified fluctuations in Portugal. The cycle history of the previous section strongly suggests that despite the political similarity in

³ The Hodrick-Prescott filter identifies the trend in a series with a two component formula. The first component minimises the sum of squares of deviations of the output series from the trend. The second chooses a trend that penalises variation in its growth. This component is multiplied by a larger constant the more growth variation is to be penalised. So a larger weight is usually imposed for quarterly than for annual data (100 is used here).

some respects of the two countries' regimes from 1945-74, both political shocks and different outcomes of democratic transitions are likely underlie this pattern. Judged by cycle volatility the transition appears to be more successful in Spain, whereas before 1974 the Portuguese economy seems to perform better.

Another approach to identifying cycle regime changes involves two different tests of structural breaks in output gap (HP) volatility. The output gap is modelled as an AR(1) process, then t-statistics for cumulative squared residuals and z-stats for year dummies are recursively estimated in the conditional variance equation of an ARCH model. The results of both tests, presented in Figure 5, show structural breaks for Spain around 1961 (suggestive of the impact of the Stabilisation programme). For Portugal a break more puzzling is identified in the late 1960s and, more credibly, possibly around 1974 (where revolution and oil shocks confer an embarrassment of choice).

FIGURE 5 ABOUT HERE

How much of the cycle differences stem from the shocks or from the structure and management of the economies? Does the lower (higher) volatility of GDP reflect weaker (stronger) shocks, or shifts in the dynamic process which transmit shocks to output (changes in persistence)? Whether this matters depends upon whether the shocks can be regarded as truly exogenous- even though unexpected. For instance, the Spanish crisis of 1959 was clearly a consequence of Spanish economic management, even though the run on foreign exchange at first sight looks like an external shock. On the other hand the economic disruption of the Portuguese revolution can be regarded as an exogenous supply side shock because, for present purposes, the political upheaval can be regarded as independent of the management of the economy.

Although in some respects Iberian economic experience diverges, in others there is convergence. Admission to the EEC and preparation to the EMS imposed common economic management requirements. Figure 6, which shows cycles in the post-1945 period, picks out the 1950 and 1959 slumps in Spain. Portugal is more ambiguous but clearly the cycles are much more muted than Spain's. The post-revolution slump in 1975 is very apparent in Portugal but not in Spain where a smooth transition was

engineered. An ‘Iberian cycle’ appears only after 1985, consistent with accession to EC and the EMS as providing the common shocks. Most likely then, this post-1985 Iberian correlation is not a permanent cycle synchronisation, as recent Portuguese experience suggests.

FIGURE 6 ABOUT HERE

In a longer term perspective there seem to be two well defined periods of increasing synchronicity: the 1920s and the 1980s-90s. This is illustrated in Figure 7. The absence of correlation in the 1950s and 60s is striking, especially when compared with the BK results. The collapse of the world economy in the 1930s, the rise of autarkic economic policies, the Second World War, and catch up growth with highly restricted foreign payments arrangements, followed by different democratic transitions, at first sight appear to account for the asynchronous periods. In particular the capital controls in place from the 1930s to the 1980s permitted a high degree of national fiscal and monetary autonomy. For much of the period then the recent discussion of fiscal divergence as a reason for lack of business cycle synchronization (Darvas, Rose and Szapary 2005) appears to be especially appropriate and therefore is now considered in greater detail.

FIGURE 7 ABOUT HERE

3. The Fiscal Cross-over

If regime change was responsible for the crossover in Iberian cycle volatility then the likelihood is that fiscal policy differed. Our empirical strategy is therefore to test for systematic fiscal reactions to economic fluctuations. The main hypothesis is that the government adjusts its fiscal stance in response to changes in fluctuations of the aggregate level of economic activity, after taking into account the constraint provided by the level of outstanding debt (necessary to ensure the sustainability of the debt dynamics).

There is substantial ambiguity about the expected relationship between fiscal policy and fluctuations in the aggregate level of economic activity (see Lane 2003, 2663-5 for a review). Public consumption would move countercyclically with private consumption if

they were substitutes, and procyclically if complements. The cyclical behaviour of public investments may depend on the time horizon over which they are planned, and also on their complementarity or substitutability with factors whose productivity is affected by current shocks. Finally, the automatic spending stabilizers built in, government transfers, should exhibit countercyclical movements, increasing during recessions.

Whereas the counter- or pro-cyclical bias of government spending is left open in the foregoing approach, with demand management, public expenditure and especially public investment, are intended to stabilise output by moving countercyclically, with different categories of public spending having a different stabilizing impact according to their multipliers. Conversely government spending might move procyclically, influenced by political economy factors—for instance, expansions may increase the returns to lobbying .

One important implication is that the relationship between fiscal policy and the cycle could be influenced by the size and composition of government expenditures. In fact, both went through dramatic changes in Spain and Portugal. Figure 8 clearly documents the structural break in fiscal regime that took place in the size of government spending in both countries as a consequence of democratization. As a consequence of the transition to big government, both the cycle amplifying and dampening effect of fiscal policy are likely to be stronger after the mid-1970s than before.

FIGURE 8 ABOUT HERE

The change in the composition of government expenditure is presented in Figure 9 both for Spain and Portugal. The pattern of change was similar, but with different timing. In Spain, before the 1959 Stabilization Plan, wages and purchases made up 70 per cent of total government expenditures. The emergence of the developmental state in the 1960s brought a rapid expansion of the share of investment and capital transfers, and a less sustained growth of current transfers; this last became the dominant component from the 1970s with the accelerated expansion of welfare schemes. In Portugal by contrast, the transition to a modern expenditure structure was delayed, with wages and purchases still well over 60 per cent of total at the mid-1970s. After the revolution, the expansion

of the current transfer share was dramatic, but much less than that of investment and capital transfers.

FIGURE 9 ABOUT HERE

In order better to understand the movement of government expenditure across cycles and regimes, we carry out a preliminary investigation of the correlation coefficients of the HP-filtered aggregate and disaggregated components of public expenditures with the growth cycle. (For a similar approach see Agenor et al 1999 and Talvi and Vegh 2000). The results are presented in Table 2.

TABLE 2 ABOUT HERE

For Spain, the Franco period (1945-75) contrasts starkly with the democratic regime. Under Franco, tax revenues were almost uncorrelated with cycles and primary expenditures were weakly procyclical. With democracy, revenues became strongly procyclical (consistent with the modernization of the tax system) and primary expenditure strongly countercyclical. Among the expenditure components, wages and purchases were consistently procyclical throughout (wages especially before 1959 with correlation coefficient 0.641; purchases between 1960 and 1975, with coefficient 0.773). Current transfers were mildly procyclical under Franco only to turn definitely countercyclical with democracy (consistent with the gradual incorporation of automatic stabilizers through tax reform, and also with the rapid welfare state building at the same time as the slowdown of the late 1970s and early 1980s). Capital transfers - the fastest growing component from the mid-1950s to the late 1960s - were strongly countercyclical under Franco (coefficient -0.545). From the 1980s this component became mildly procyclical; investment showed a very low correlation with cycles throughout, possibly because based on long-run, multi-year spending plans.

These results suggest that fiscal policy might have been destabilizing under Franco, fuelling expansions and exacerbating contractions. The regime indulged in fiscal profligacy and fed the “voracity” of its constituencies during periods of accelerating output growth, by expanding capital spending and state employees’ promotions and wages, only to be forced to cut back during phases of economic slowdown.

Figures for Portugal tell a different story. During the Salazar regime, tax revenues were almost uncorrelated with cycles (as in Spain), whereas primary expenditure were procyclical in the 1950s but then countercyclical after 1960 (the opposite of Spain). Under the democratic regime, taxes became procyclical as expected, but primary expenditure turned strongly procyclical until the mid-1980s (the opposite of Spain), then acyclical after 1987. Among expenditure components, under Salazar purchases were procyclical (as under Franco)—though more so in the 1950s than afterwards—but wages and especially current transfers were strongly countercyclical (another strong difference from Spain).

In the post-revolutionary period, however, wages, investment and capital transfers became strongly procyclical, whereas current transfers remained acyclical until the mid-1980s and turned countercyclical—as they should—only after 1986. These figures support the story of fiscal policy crossover: government expenditure acted as a stabilizing force (especially in the 1960s) of the Salazarian economy, but as a magnifying factor of economic fluctuations in the post-revolutionary Portugal (in this respect, much more similar to Franco than to democratic Spain). Ideology as well as the political economy (were the Portuguese constituencies more “voracious” than the Spanish?) might be at the origin of such difference.

Another dimension is volatility of fiscal expenditures. Some elements can be recovered from Figure 10, which shows the cyclical fluctuations of real GDP and real government expenditures around their trend. The shaded areas denote the alternation of periods of real fiscal expansions and contractions.

FIGURE 10 ABOUT HERE

The highly erratic behaviour of the Franco authorities, characterized by frequent and sudden swings of spending stance with an overall expansionary thrust, especially in the 1960s, stands in stark contrast with the more stable and prevailingly contractionary posture of the Salazarian policymakers.

Again, a crossover emerges after the turning point of the mid-1970s, with the Portuguese governments engaged in a sequence of long and intense procyclical fiscal expansions (1973-81 and 1987-93) with a dramatic procyclical contraction in between (1982-87, in the run-up of EEC accession). The Spanish authorities, in contrast, moved along a more stable path with fluctuations much less pronounced than those experienced under Franco. Of course there is also an element of luck in the story: the period 1975-83, in which the democratic transition translated in both countries into a sustained expansion of welfare expenditures, coincided with a period of accelerating growth in Portugal (with a magnifying effect) and with a slowdown of growth in Spain (with a countercyclical, possibly stabilizing effect). The crossover of the standard deviation of real expenditure cycles, reported at the bottom of Figure 11, confirms this view. When compared with Portugal, the Spanish expenditure cycle is consistently more volatile before 1975 (with the exception of the first half of the 1960s, when volatility also rose in Portugal), and consistently less volatile afterwards.

FIGURE 11 ABOUT HERE

The same figure shows, in the top section, that the two expenditure cycles were highly synchronized in the late 1940s and early 1950s. This coordination was lost in the late 1950s and the cycles became negatively correlated from 1960 until the end of the period, with short-lived episodes of return to synchronization, mainly during the long fiscal expansion 1975-1983. Whereas the output cycle of the two Iberian countries is finally synchronized after 1986 (at least as far as our data set extends), the two expenditure cycles synchronize (temporarily) only in the early 1990s.

4. Reaction Functions

If there is a persistent systematic response of fiscal policy to policy targets, to target determinants or to their constraints, then a fiscal reaction function exists. Some such policy rules may be optimal, others may be harmful; policy makers are not invariably omniscient, omnibenevolent and omniscient. 'Fiscal irresponsibility' stems from political instability. Dictatorships and revolutionary governments, among others, need to assuage influential pressure groups (unions, big business, the army, religious bodies, regional separatists) to remain in power. Moreover information flows can be attenuated

because open policy debate becomes subversive for insecure governments if the wrong conclusions are reached. So spending increases excessively until an external crisis intervenes and forces painful cutbacks. Government spending and deficits rise with the upswing of the cycle.

By contrast politically stable regimes are strong enough to hold back competing forces for greater state spending. They may be able to tolerate open policy debate. They may even use their budgets to stabilise the economy, though the built-in components of tax revenue with rates unchanged are likely to be more prominent than spending changes. Such regimes will show acyclical or countercyclical fiscal policies.

Cross-country cycle correlations occur with similar shocks- which may sometimes be related to similar economic structures- and similar policies. Even with dissimilar policies shocks may be large enough to dominate- which appears to be the more recent Iberian case. Asynchronicity may arise when policies or shocks or economic structures differ (Rigobon 2005).

The Iberian economies may be thought of in the simplest form as a dynamic IS function in which the growth of output (g_t) depends upon lagged output growth (g_{t-1}) and on the lagged monetised real deficit (ΔM_{t-1}), which in turn depends upon lagged inflation (π_{t-1}). A Phillips curve determines the rate of inflation as a function of a dynamic output gap ($g_{t-1} - g^*$). Supply shocks ('s shock') shift the Phillips curve and demand shocks ('d shock') shift the IS function. In this version interest rates do not enter explicitly because in the tightly regulated Spanish economy of the 1950s they were not permitted an allocative function. But interest rates and money are commonly introduced into such models for industrial economies today, and may replace the monetised deficit without affecting the general argument. These equations create reduced form second order difference equations in output and inflation, that with plausible parameter values, generate damped cycles in response to supply or demand shocks.

$$\begin{array}{ll} \text{IS} & g_t = g_{t-1} + b \cdot (\Delta M_{t-1} - \pi_{t-1}) + d \text{ shock} \\ \text{Phillips} & \pi_t = \pi_{t-1} + a(g_{t-1} - g^*) + s \text{ shock} \end{array}$$

A conventional policy reaction function would target inflation and the output gap, penalising deviations from targets quadratically. The implication of what has been said

about policy is that the weight on inflation was small under Franco before 1959 and but large under Salazar. Important questions are whether policy makers behaved systematically over time, and whether there were structural changes.

$$\text{Reaction} \quad \Delta M_t = \Delta M_{t-1} + c_1(\pi_t - \pi^*)^2 + c_2(g_t - g^*)^2$$

Recent empirical specifications of fiscal policy reaction functions are usually based on the ratio of primary balance to GDP as the standard indicator of fiscal stance, since it is supposed better to capture the discretionary dimension of fiscal policy (Darvas et al. 2005; Fatas and Mihov 2002; Gavin and Perotti 1997; Lane 2003). However, the use of primary balance raises an identification problem. Theoretically, the cyclicity of fiscal policy stance can be optimally assessed in terms of instruments—that is, government spending—rather than endogenous outcomes such as the fiscal balance. In fact Kaminsky et al. (2004: 7-9) demonstrate that, irrespectively of the acyclical, procyclical or countercyclical stance of fiscal policy, its cyclicity eludes unambiguous interpretations when the real primary balance or its GDP ratio are used.⁴ Since real government expenditures are better able to discriminate between pro-cyclical (magnifying), countercyclical (stabilizing) and acyclical policies, we generally prefer to use the latter as an alternative, possibly superior indicator of fiscal policy stance.

However, the government is not totally unconstrained in its expenditure decisions. One major constraint is provided by the level of outstanding debt, which together with interest rates, indicates the size of the debt service component of the government budget. Closely related is the growth rate of the economy: when growth rates fall, previous levels of debt accumulation are no longer compatible with a stable or falling debt income ratio, so that the government must adjust its fiscal stance.

In addition for the Iberian economies during the period under consideration, when we seek to explain government spending rather than the deficit, we must take into account ‘Wagner’s Law’; the tendency for government to assume a larger economic role with

⁴ In the case of acyclical fiscal policy with constant tax rate and government expenditure, tax revenues and the primary balance are positively correlated with the cycle, but the GDP ratio of government expenditure is negatively correlated with the cycle, and the correlation of the GDP ratio of tax revenues is ambiguous, as it also turns the GDP ratio of primary balance. With procyclical fiscal policy (identified by falling tax rate and increasing expenditure in good times), the correlation of tax revenues and their GDP ratio with the cycle is ambiguous (the tax rate falls but the tax base increases) and the same happens to the GDP ratio of the primary balance.

economic development. The introduction of welfare state benefits is a particularly prominent instance.

Figure 12, which plots for both countries the long-run dynamic of growth rate and debt ratios, shows that debt and growth constraints became particularly binding for both countries from the 1980s, when pressure for welfare state spending was growing.

FIGURE 12 ABOUT HERE

Taking into account such constraints, our approach to fiscal reaction functions in the simplest form can be written as:

$$\Delta PG_t = \varphi_0 + \varphi_x x_t + \varphi_b b_{t-1} + \varphi_g g_{t-1} + u_t \quad (1)$$

where ΔPG is the first difference of log-real primary expenditure, x is the output gap (measured as deviation from trend obtained by applying a HP filter with smoothing parameter 100, as usual for annual observations, to the log of real GDP), b is the GDP ratio of debt outstanding and g is the long-run growth rate of the economy (measured as the first difference of the log-GDP HP trend). A fiscal policy aimed at countercyclical stabilisation would be indicated by $\varphi_x < 0$ —in good (bad) times when cyclical conditions are above trend (below trend), the government reduces (increases) real expenditure and fiscal policy turns restrictive (expansionary)—, and pro-cyclicality by $\varphi_x > 0$. As for the debt constraint, $\varphi_b < 0$ indicates that, when past spending and borrowing have been high, real current expenditure must be adjusted to prevent the debt-income ratio spiralling out of control; on the other hand $\varphi_b \geq 0$ shows that past borrowing is no constraint on present borrowing, either because debt-income levels are so low, or because fiscal policy is irresponsible and unsustainable. Finally, $\varphi_g \geq 0$ would indicate that a high long-run growth rate of the economy favours expansionary fiscal policies.

An estimation problem of (1) is that changes in fiscal policy may cause contemporaneous changes in aggregate demand, hence in the output gap, or at least that was often the intention. If this was so, the OLS estimate of φ_x would be biased. For instance, recent studies (such as Galí and Perotti 2003) have sought to distinguish the ‘policy constant’ or ‘cyclical’ aspects of changes in the budget deficit or surplus (due to automatic stabilisation) from systematic, discretionary policy responses to changes in the utilisation of the economy’s capacity. One typical solution to the problem of

endogeneity and reverse causation is either to use lagged explanatory variables. Another employs instrumental variables, regressing the indicator of fiscal stance on a component of the output gap which is not correlated with exogenous discretionary fiscal shocks—for instance by instrumenting x_t with x_{t-1} and the US output gap.⁵

The timing of fiscal policy decisions is also relevant, so at time t , the expected output gap ($E_{t-1}x_t$)—or, the past output gap (x_{t-1}), if we assume backward-looking behaviour—can prove relevant, rather than the actual gap. Hence, the approach we adopt here is simply to use x_{t-1} , the lagged output gap. An additional problem, also suggested by Gali and Perotti (2003), is that changes in fiscal stance may be gradual rather than instantaneous and/or exogenous shocks can be serially correlated, so that the use of an autoregressive element seems also warranted.

In the light of the foregoing discussion, the revised specification of the fiscal reaction function is:

$$\Delta PG_t = \varphi_0 + \varphi_x x_{t-1} + \varphi_b b_{t-1} + \varphi_g g_{t-1} + \varphi_{AR} \Delta PG_{t-1} + u_t \quad (2)$$

where u , the random error, is the stochastic portion of fiscal policy that cannot be explained by the specified policy rule. This equation can be regarded as the reduced form of a structural model of the determination of government expenditure in which policymakers tend to stabilize the debt/GDP ratio around a target (Gali and Perotti 2003) and adjust fiscal policy to the long-run growth rate of the economy. Specification (2) is estimated by OLS and GMM.

However, the dramatic political and institutional changes undergone by the two Iberian countries between the end of WW2 and the 1990s, together with the profound changes in the composition of government expenditure and in the constraints created by monetary arrangements, suggest that there is a significant probability that the parameters of the fiscal reaction function are not stable. Changes over time in φ_x , the fiscal response coefficient to lagged deviations of output from trend, test to what extent different institutional environments and monetary arrangements may have constrained governments in their attempt to stabilize output. Was φ_x different under dictatorial and

⁵ This is because fiscal policy coordination is more unlikely to be a determinant of business cycle coordination between European countries and the USA, than among European countries (especially since the 1980s onwards), which makes it a suitable instrument. See Gali and Perotti (2003)

democratic regimes? Was it higher in the pre-1971 Bretton Woods environment, or under the hard EMS (thus, less countercyclical or even procyclical)? And how does Portugal fare compared with Spain? Can this estimate help explain the divergence in cycle volatility and the lack of correlation?

A possible test is to interact with the output gap indicator a set of dummies for different institutional and monetary regimes: post-59 (in the case of Spain to assess the impact of the stabilization plan), post-71 (after the end of the peg regime of Bretton Woods), post-74 and 75 (to discriminate between Salazar/Franco and democracy), post-87 (the hard-EMS period, which captures also the possible impact of Spanish and Portuguese accession to EEC). All dummies take the value of 1 after the relevant date, and 0 before. Additionally, following the literature which argues in favour of the existence of political budget cycles especially in “young” democracies (Brender and Drazen 2005), we incorporate to the specification an election dummy taking the value of 1 in general elections years (only parliamentary elections, not presidential, in the case of Portugal) and 0 in non-election years.

Data specification and sources are detailed in the Appendix. But a critical point about the Spanish data must be noted here. The World Bank (1963) team reported that in 1962 there were 1600 autonomous official spending units with less than perfect reporting standards. Consequently their public expenditure discussion was confined to central government spending for which they could obtain data. The OECD (1963 5 fn 1) lamented ‘ a quantitative description of trends in total output and demand is extremely difficult given the present state of Spanish economic statistics’. It is unlikely that the government spending series employed in the present analysis cover all official expenditure because the Franco budgets on this measure are broadly in balance. Yet the high and erratic inflation of the period is unlikely to have any other origin than official spending, including that by INI and other state enterprises. Changes in government debt therefore provide an alternative guide to fiscal policy for the entire period from 1945.

The results of our benchmark estimates for Spain are presented in Table 3.

TABLE 3 ABOUT HERE

The evidence for Spain can be summarised as follows. With the change in government spending as dependent variable, we find no evidence of a unique policy rule when we estimate the reaction function for the whole period either by OLS or GMM (col. 1 and 2). However there are rules for sub-periods; the GMM estimates suggest that the fiscal response was definitely pro-cyclical (hence, destabilising) during the early period of the Franco regime and turned generally countercyclical (hence, stabilising) after the Stabilisation Plan of 1959 (col. 3 and 4). On the other hand, there is no evidence of an impact of the change of political regime in 1975 on the response of fiscal policy to business cycles (col. 5 and 6). This result points to 1959 as the real turning point of the Spanish macroeconomic regime, and is also confirmed when we separately estimate the reaction function for the 1947-1975 period (col. 7 to 10). We fail to find evidence that the democratic regime differed substantially from the late Franco regime as far as fiscal policy responses are concerned (col. 11 to 17). Indeed there seems to be no systematic response of this measure of fiscal policy to lagged output gaps. Nor can we observe any difference after accession to EEC and under the hard EMS (col. 15), after accession to the EMS in 1990 (col. 16) or after the signature of the Maastricht treaty (col. 17, although in this case OLS estimates suggest some pro-cyclical policy). However, the election dummy is found positive and significant across different specifications (col. 13 to 17 based on GMM), which lends some support to the existence of an electoral fiscal cycle in the “young” Spanish democracy.

We also find strong and consistent evidence that fiscal policy was constrained by the level of public debt, which is always negative and significant, especially during the democratic regime. By contrast, the long-run growth rate of the economy tended to magnify the expansionary stance of fiscal policy particularly during the Franco regime (with an estimated ϕ_g coefficient in the range of 2.0 and 3.0), whereas the elasticity of ΔPG (the change in primary government spending) to long-run growth becomes insignificant after 1975.

Using the change in debt as a proportion of GDP as a fiscal indicator, with its broader coverage of state spending, the regression estimates of Spanish fiscal policy reaction functions in Table 3a demonstrates that, for the period after the Stabilisation Plan, as the cyclically adjusted GDP goes from negative to positive, the growth of debt (the deficit) falls. Since this output gap is instrumented, the coefficient estimates not built in

stabilisation but a reaction function. The output gap coefficients show that the post-Plan fiscal reaction function stabilises whereas the Franco regime before the Plan did not (equation including insignificant output gap not reported). Moreover the Franco regime is constrained by past debt levels (coefficient <0) but the post Plan regime is not (sum of coefficients >0). After the end of the Franco regime there was a once and for all greater tendency to borrow, possibly because of improved creditworthiness. These elements of the reaction function are sufficient to explain qualitatively the different cyclical volatilities of the pre and post 1959 regimes.

TABLE 3A ABOUT HERE

As shown in Table 4, unlike the Spain, Portugal in the period 1949-1995 is clearly ruled by a strong pro-cyclical stance of government expenditures (col. 1 and 2). Most probably the post-1974 period accounts entirely for this result (col. 4 based on OLS estimates). In fact, when estimated separately, the fiscal stance during the Salazarian regime turns out to be acyclical, although it responded positively to the long-run growth rate of the economy (col. 5 to 8). Conversely, we find quite strong evidence of the pro-cyclicality of Portuguese fiscal policy when we estimate the reaction function separately for the post-1974 period (col. 9 and 10), for which we also obtain R² values around or above 60 per cent.

The impact of the IMF-supervised stabilization plans of 1979 (col. 11 and 12) and 1983 (col. 13 and 14) is not unambiguously captured, but they seem to have failed to keep under control the pro-cyclical inclination of fiscal policy (col. 12 and 14). The elasticity of ΔPG to long-run growth is also large—between 6.0 and 7.0, at least twice the magnitude of the ϕ_g coefficient estimated for the Franco period in Spain- indicative of the lower stability of the regime in Portugal. The election dummy, on the contrary, does not support the hypothesis of an electoral budget cycle in democratic Portugal.

5. Conclusion

The amplitude of the Spanish cycle, certainly before the Stabilisation reforms of 1959 appear to have been greater than after 1975, despite severer macroeconomic shocks in the later period. The earlier Franco economic regime was one of administratively forced industrialisation, which with little regard for budget constraints, appropriately for an

initially military regime, periodically ran into financial and balance of payments crises. Subsequently economic liberalisation accompanied political liberalisation and permitted smoother adjustments. Whereas in Spain, the Opus Dei ministers, who came to power with the Plan, managed eventually to tame the excesses of a militarily directed economy, and the dictator ensured a transition that kept the army's loyalty, the opposite path was followed in Portugal. Fiscal prudence allowed Portugal to match Spain's spectacular growth rates of the 1950s and 1960s without economic crises, but failure to secure the army prevented a smooth transition from dictatorship. In consequence Portugal experienced more extreme downturns and budgetary policies than Spain after 2000, and the Maastricht/EMU shocks.

Formally the processes were modelled with fiscal reaction functions. These show that the post- Salazar regime in Portugal was responsible for increasing the volatility of the cycle. In Spain there is evidence of differences between the early Franco regime and the regime after the 1959 reforms. The early Franco regime was either destabilising with central government spending or acyclical with the total state budget whereas after 1959 there was stabilisation. Unlike Portugal there is minimal direct evidence of EMS pressure on fiscal policy, presumably because thanks to the nature of the regime change Spanish fiscal policy was already more disciplined. The net effect of EMS has been to appear to synchronise Iberian cycles with each other and with the eurozone, by removing much fiscal policy discretion, but Portuguese experience indicates cycles are not yet aligned, because Portuguese fiscal policy remains more erratic than can be accommodated, as a legacy of the Revolution..

Data Sources Appendix

Spain. GDP and its components, GDP deflator from L. Prados de la Escosura, *El progreso económico de España 1850-2000* (Fundación BBVA, 2003). Fiscal and monetary data from *Estadísticas Históricas de España* (P. Martín Aceña, M.A. Pons, 'Sistema monetario y financiero'; F. Comín, D. Díaz, 'Sector público administrativo y estado del bienestar', vol. II, pp. 645-703 and 873-964 respectively).

Portugal GDP and its components, GDP deflator, fiscal and monetary data from Banco de Portugal, *Series Longas para a Economia Portuguesa Pos II Guerra Mundial 1947-1995* (revised version, from http://www.bportugal.pt/publish/serlong/serlong_p.htm). See also Santos E. Et al. (1992), 'Series Longas das Contas Nacionais Portuguesas: Aspectos Metodologicos e Actualizacao', *Bank of Portugal Quarterly Bulletin*. Debt data from M.E. Mata, N. Valerio, *Historia Económica de Portugal-Uma Perspectiva Global* (Lisboa, Presenca, 1994) and 'Estabilidade monetaria, disciplina orcamental y desempenho económico em Portugal desde 1854', in J.B. De Macedo, B. Eichengreen, J. Reis (eds.), *International Monetary Systems in Historical Perspective* (London, MacMillan, 1996)

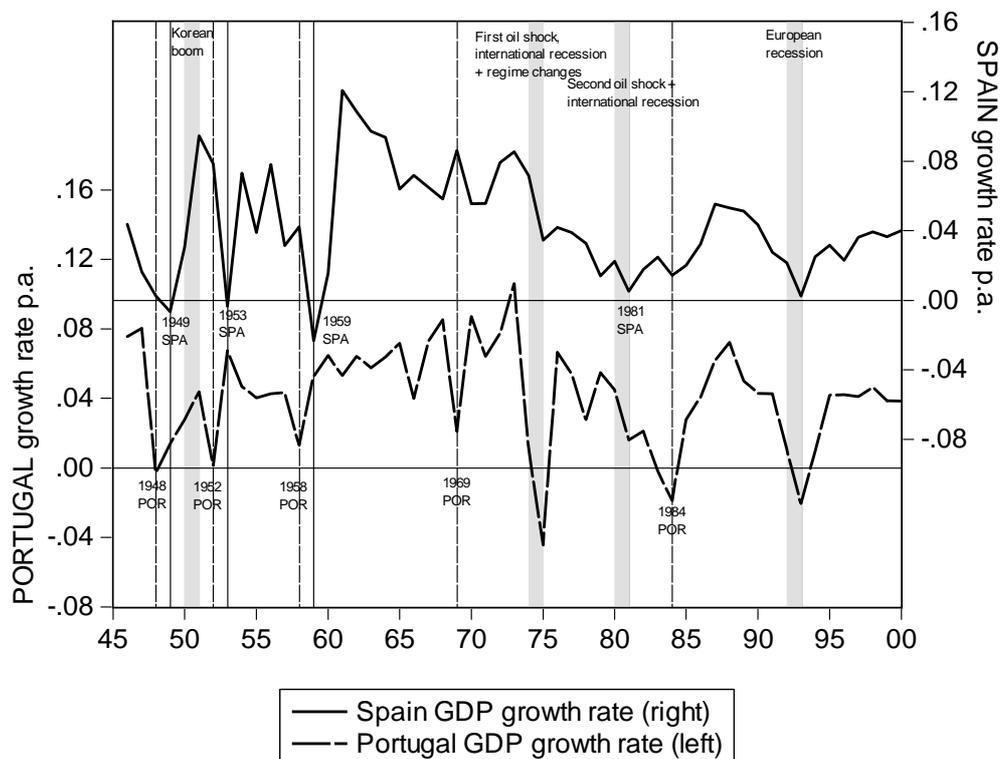
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FIGURES AND TABLES

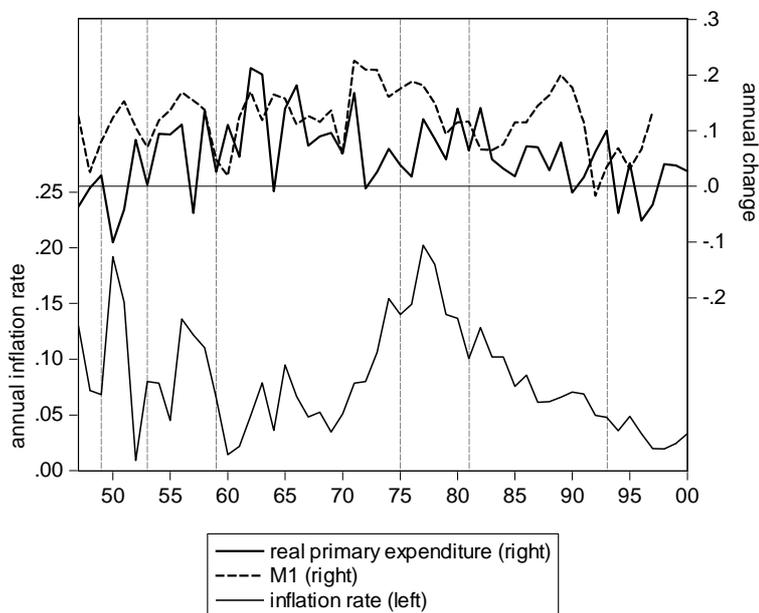
Figure 1
Growth rates and crises of Iberian economies, 1945-2000



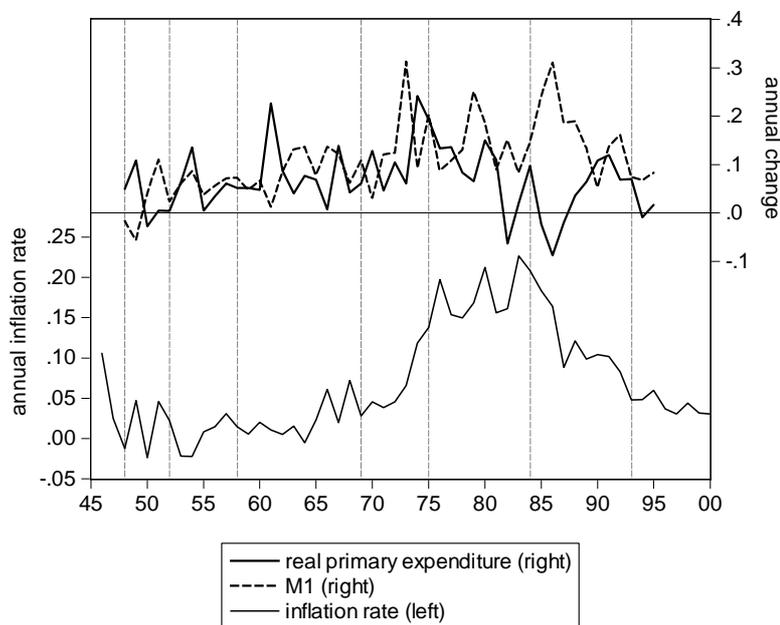
Note. Growth rate is the first difference of log real GDP expressed in 1995 values. Solid and dotted lines indicate crises. Shadowed areas indicate major international fluctuations. Sources: see Data Source Appendix.

Figure 2
Fiscal and monetary policy indicators

SPAIN



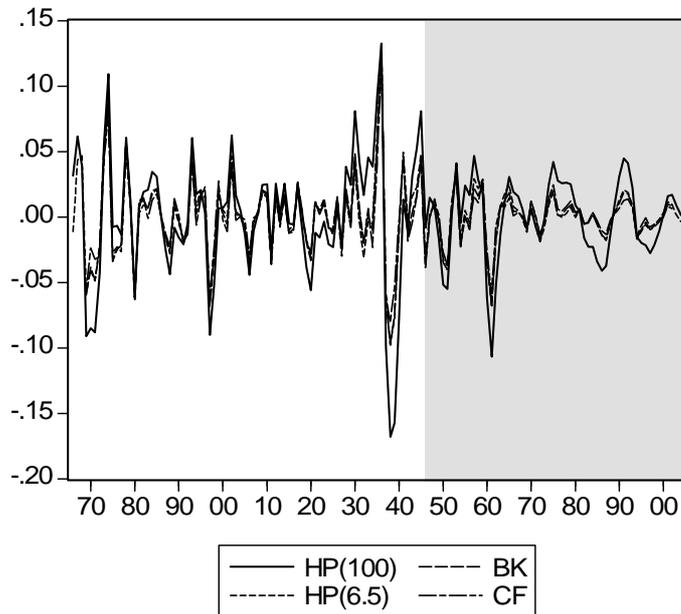
PORTUGAL



Note. Fiscal policy: change in (log) real primary government expenditure expressed in 1995 values. Monetary policy: change in (log) nominal M1. Inflation: change in (log) GDP deflator.

Figure 3
Long-run Iberian cycles (alternative filtering methods)

SPAIN



PORTUGAL

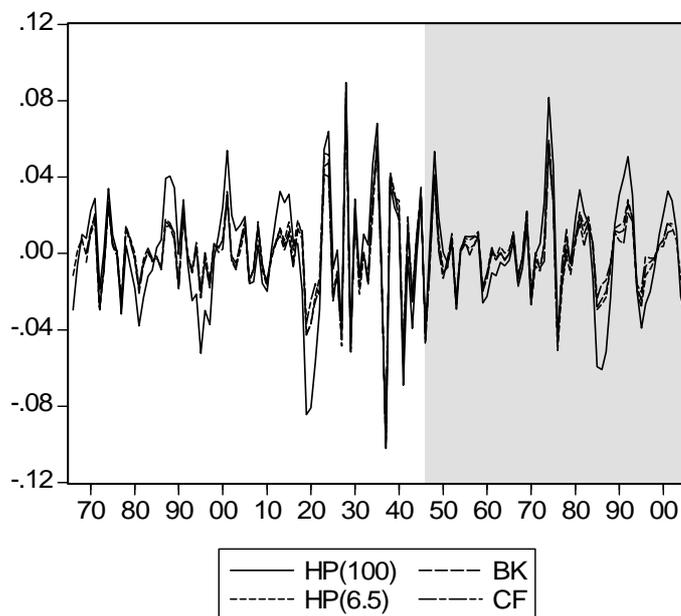
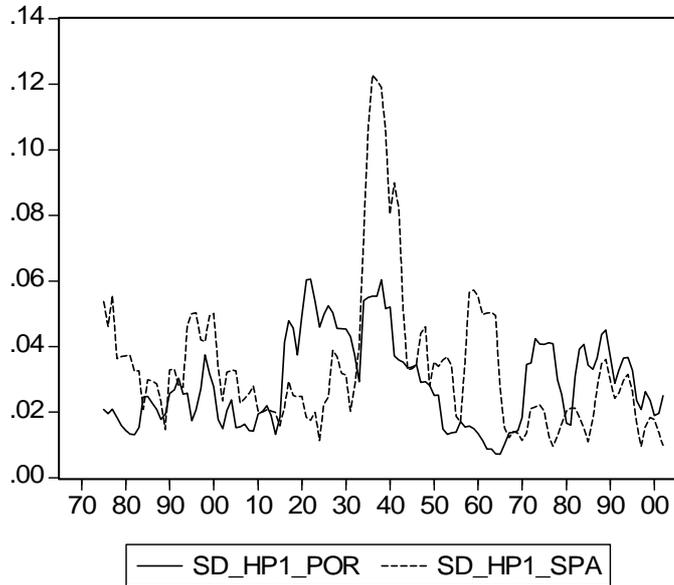
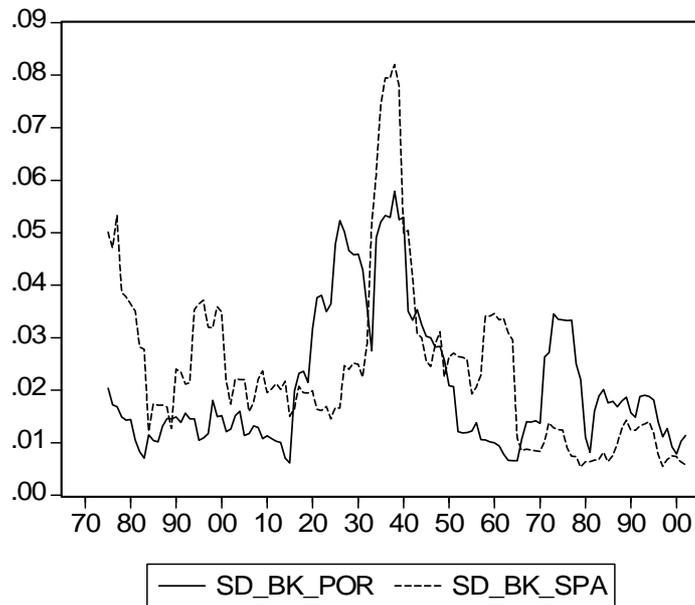


Figure 4
Time-Varying Volatility of Cycles

HP100 cycles



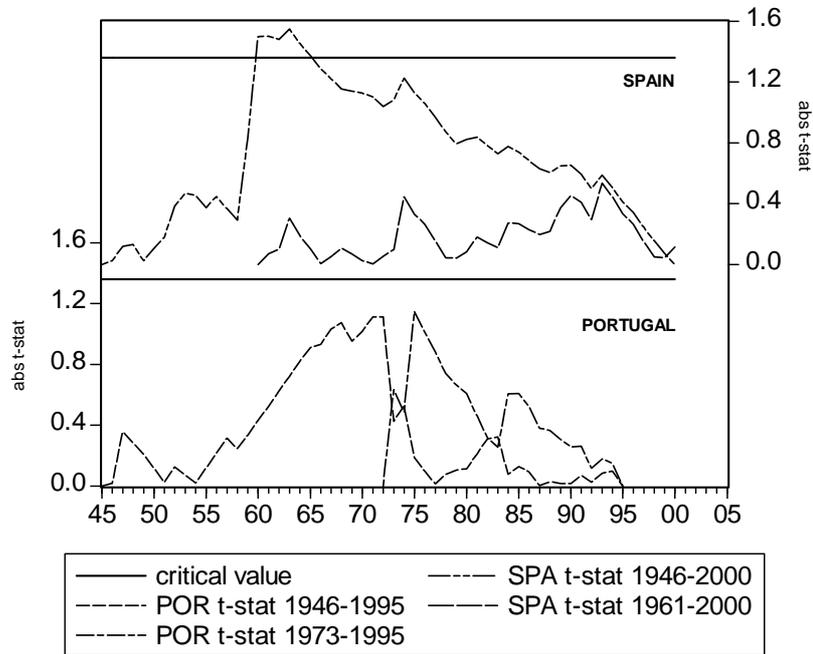
BK cycles



Note. Time-varying volatility measured by a 7-year rolling window, centered in the central years.

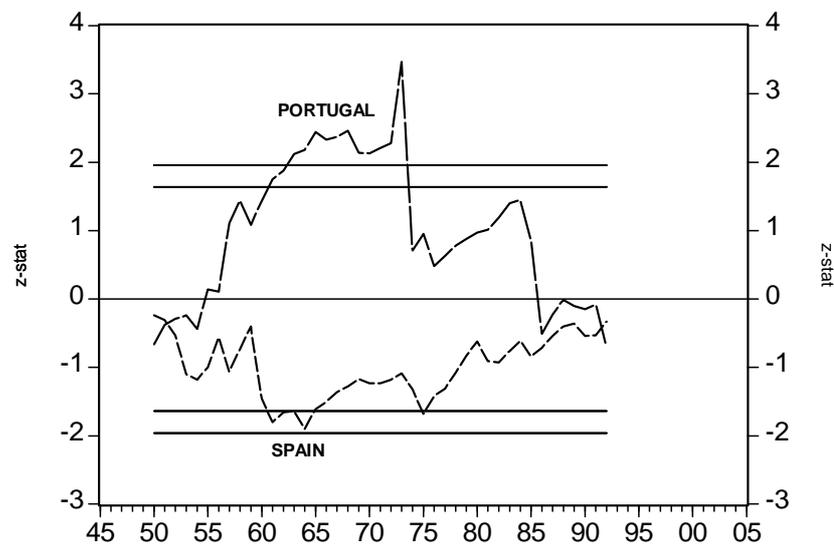
Figure 5

(a) Dk-Test of Structural Break in Output Gap Volatility



Note. The figure plots the absolute value of the t-statistics for cumulative squared residuals for a structural break in the volatility of the output gap.

(b) ARCH test of structural break in volatility of output gap



Note. The figure plots the standard normally distributed z-statistics for a structural break dummy in an ARCH model for HP output gap, and the 95 and 99 per cent critical values. Z-statistics are obtained from recursive estimation of the ARCH model

Figure 6
Post-1945 Spanish and Portuguese Cycles

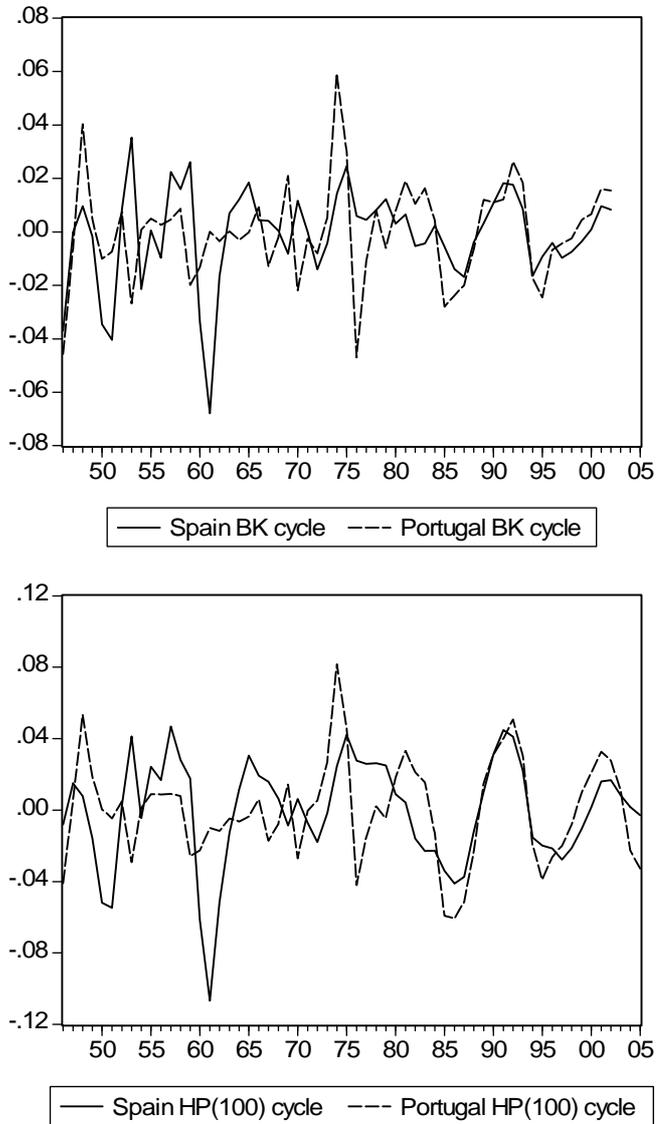
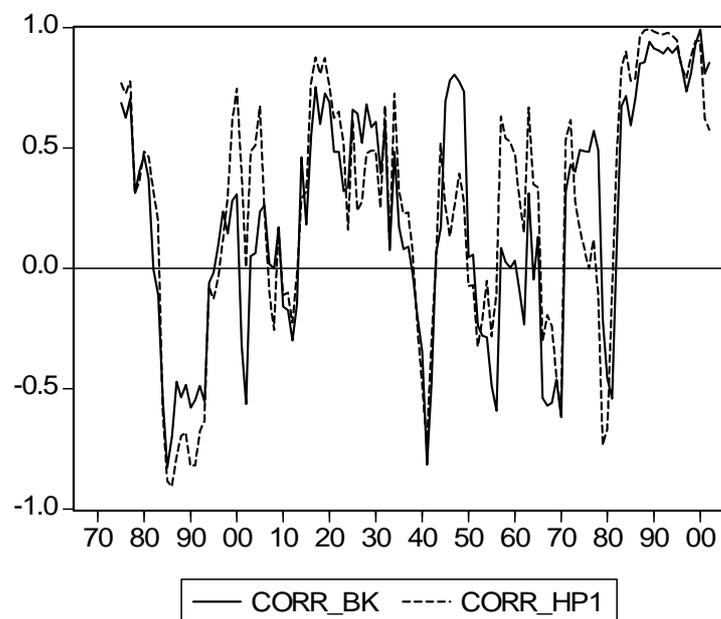


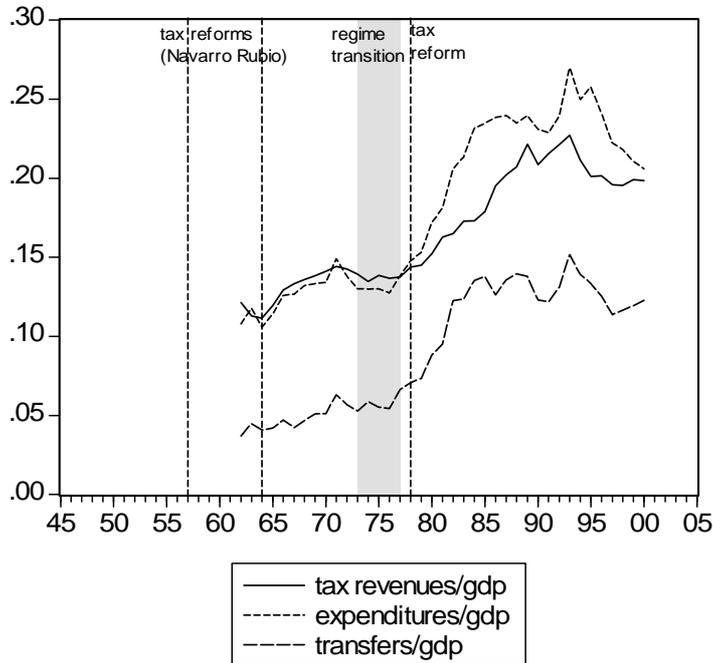
Figure 7
Time-Varying Cycle Correlation: Spain and Portugal



Note. Correlation coefficient measured over a 10-year rolling window centered in the central year.

Figure 8
Fiscal regime changes

SPAIN (central government)



PORTUGAL (central government)

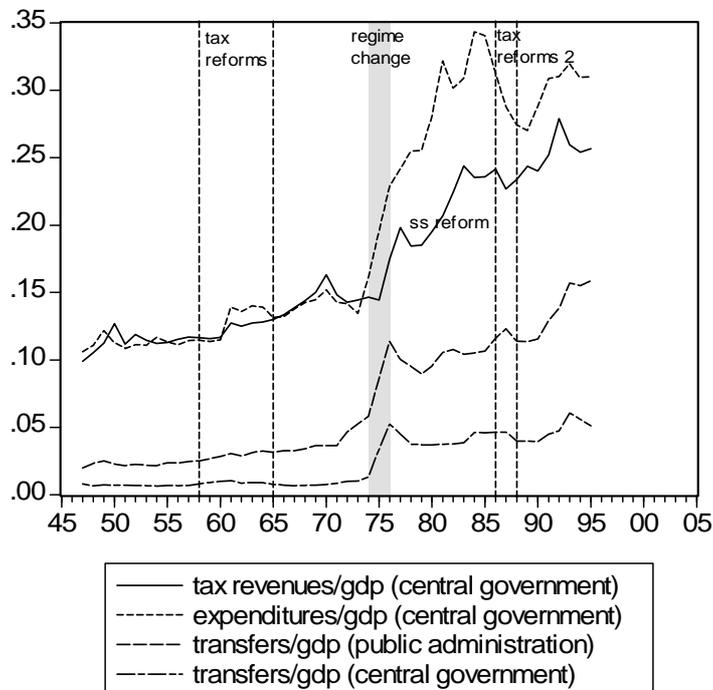
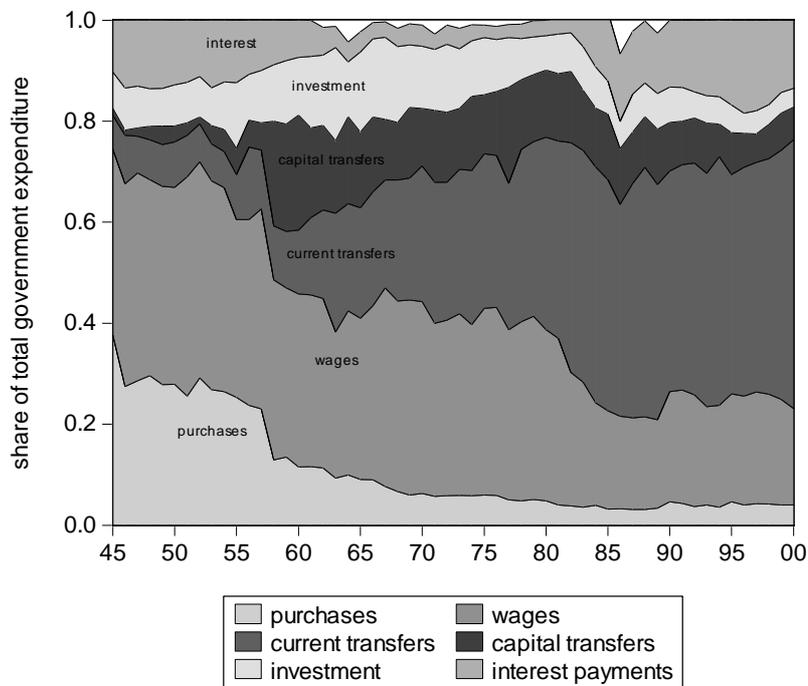


Figure 9
Structure of government expenditure

SPAIN



PORTUGAL

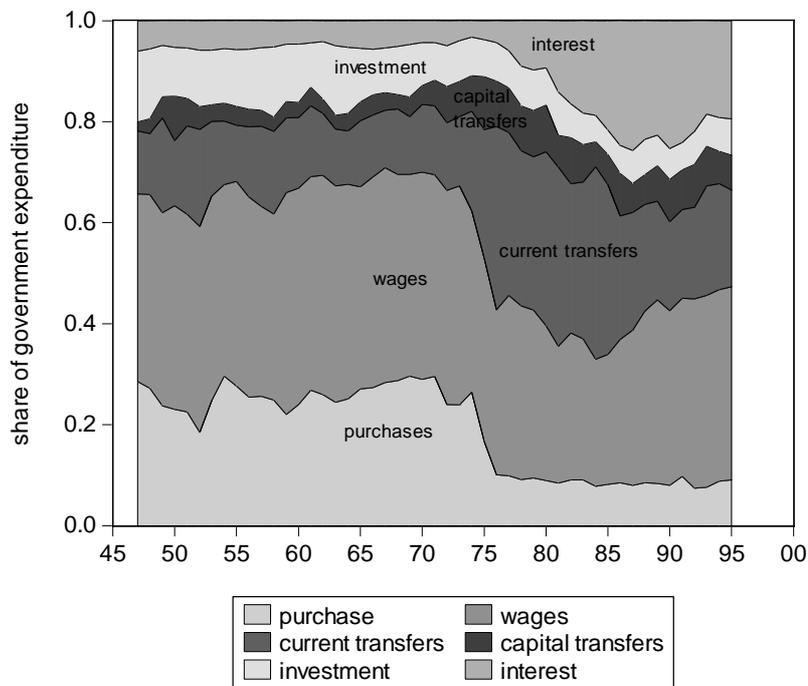
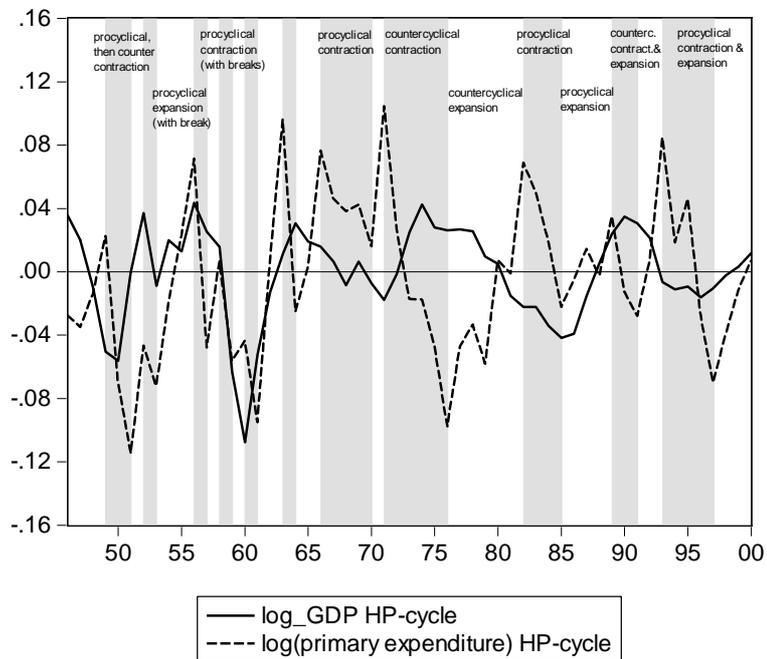
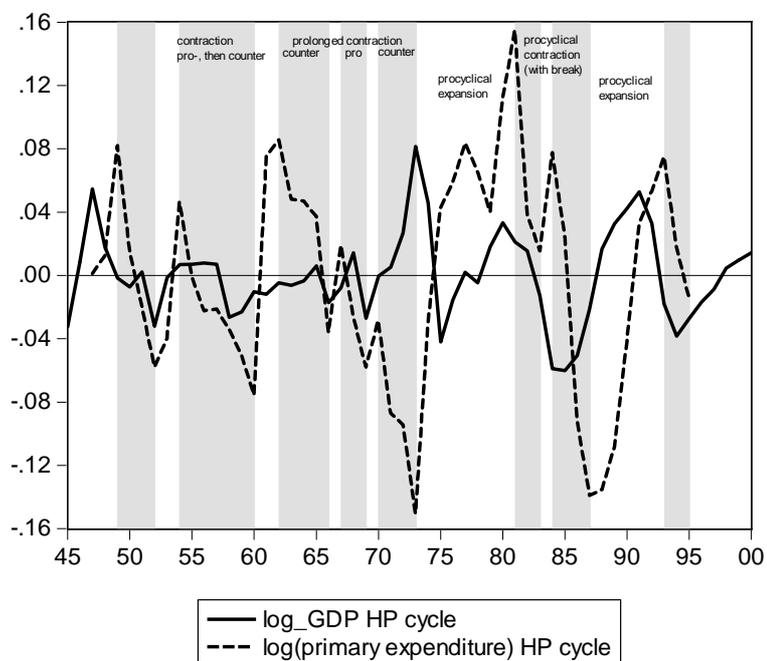


Figure 10
Real GDP and expenditure cycles

SPAIN

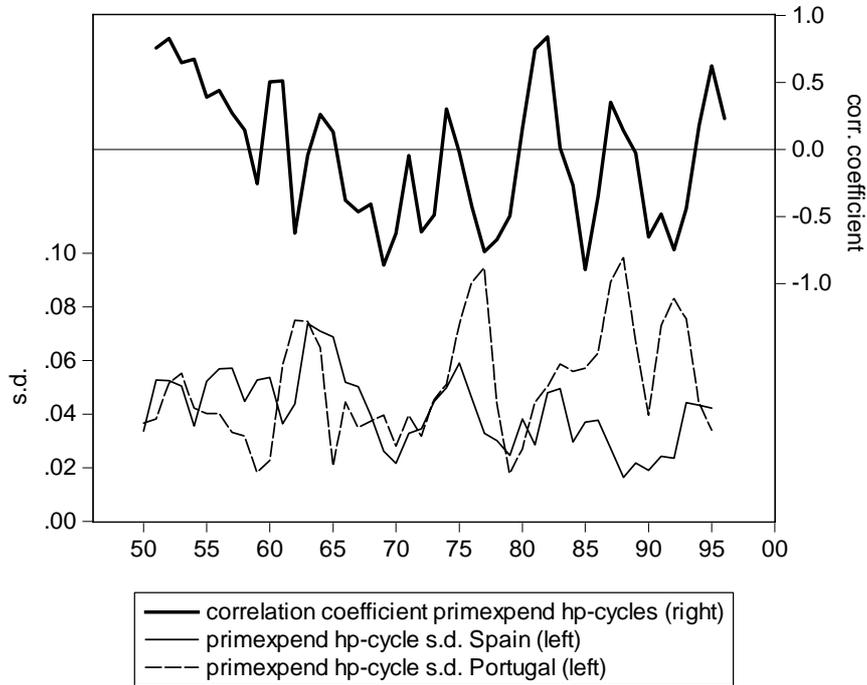


PORTUGAL



Note. GDP and primary expenditure expressed in real terms. Grey areas denote phases of fiscal contraction.

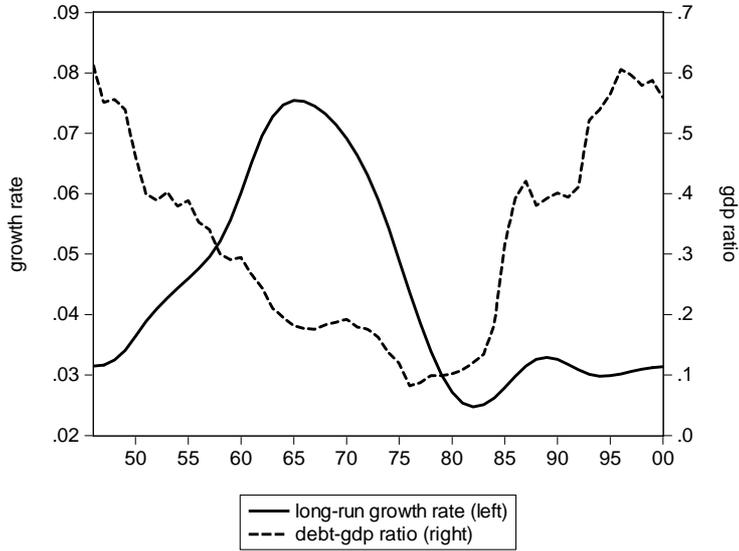
Figure 11
Correlation and volatility of real primary expenditure cycles:
Spain and Portugal



Note. HP-filtered real expenditure series. Coefficient of correlation is measured over the past 5 years for each observation. Volatility is measured as 5-year rolling-window standard deviation: each observation corresponds to the s.d. over the past 5 years.

Figure 12
Long-run growth rate and debt ratio, 1945-2000

SPAIN



PORTUGAL

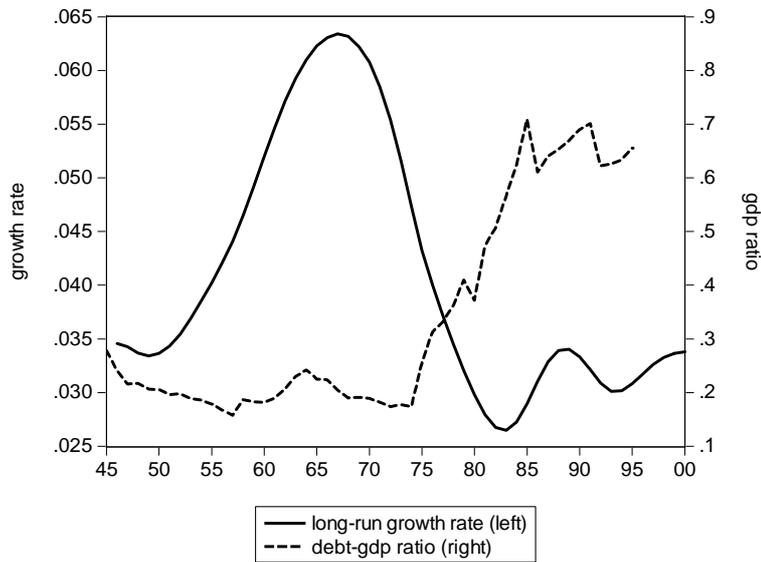


Table 1
Volatility of cycles: a long-run perspective

HP(100) cycles

	1870-1914	1890-1914	1919-1936	1946-2005	1946-71	1972-2005
S.D.						
SPA	0.040	0.033	0.049	0.029	0.036	0.024
PORT	0.024	0.025	0.051	0.028	0.018	0.033

BK Cycles

	1870-1914	1890-1914	1919-1936	1946-2005	1946-71	1972-2005
S.D.						
SPA	0.030	0.024	0.037	0.018	0.024	0.011
PORT	0.013	0.013	0.039	0.018	0.016	0.020

Table 2
Correlation of GDP and government expenditure HP-cycles, 1945-2000
SPAIN

	Correlation coefficient of log-GDP cycle and cycles of:									
	log(public cons)	log(total expend)	log(primary expend)	log(investment)	log(capital transf)	log(current transf)	log(purchases)	log(wages)	log(interest)	log(revenues)
1945-1975	0,422	0,244	0,246	0,164	-0,545	0,294	0,484	0,305	-0,063	0,095
1945-1959	0,403	0,283	0,286	0,170	-0,577	0,262	0,386	0,641	0,135	0,080
1960-1975	0,588	0,237	0,243	0,183	-0,675	0,411	0,773	0,064	-0,156	0,183
1976-2000	0,427	-0,580	-0,340	-0,044	-0,040	-0,542	0,246	0,234	-0,603	0,524
1976-1986	0,563	-0,865	-0,635	-0,295	-0,161	-0,747	0,203	0,342	-0,683	0,268
1987-2000	0,312	-0,316	-0,053	0,135	-0,235	0,295	0,295	0,109	-0,667	0,707
1945-2000	0,420	0,047	0,111	0,103	-0,454	0,104	0,421	0,269	-0,277	0,231

Note. All series are expressed in real values (1995 Ptas)

PORTUGAL

	Correlation coefficient of log-GDP cycle and cycles of:									
	log(public cons)	log(total expend)	log(primary expend)	log(investment)	log(capital transf)	log(current transf)	log(purchases)	log(wages)	log(interest)	log(revenues)
1945-1974	0,257	-0,304	-0,276	-0,066	-0,255	-0,558	0,497	-0,106	-0,388	-0,085
1945-1959	0,679	0,434	0,388	0,431	-0,440	-0,497	0,704	0,149	0,599	-0,175
1960-1974	0,116	-0,578	-0,531	-0,300	-0,043	-0,604	0,320	-0,267	-0,636	-0,001
1975-1995	0,634	0,059	0,046	0,414	0,295	-0,404	0,040	0,615	0,140	0,511
1975-1986	0,744	0,483	0,548	0,843	0,385	-0,047	-0,122	0,789	0,188	0,523
1987-1995	0,586	0,135	-0,029	-0,445	0,485	-0,610	0,244	0,541	0,502	0,649
1945-1995	0,462	-0,129	-0,111	0,150	-0,029	-0,486	0,286	0,267	-0,111	0,293

Note. All series are expressed in real values (1995 Esc)

Table 3
Reaction function benchmark estimates: SPAIN

DEPENDENT VARIABLE
d(log of real primary expenditure)

Period	1947-2000						1947-75			
	1	2	3	4	5	6	7	8	9	10
Estimation method	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
c	0.117 (6.48)	0.060 (2.54)	0.118 (6.58)	0.064 (2.56)	0.117 (6.45)	0.061 (2.58)	0.149 (4.42)	-0.135 (-1.62)	0.150 (4.88)	-0.103 (-1.16)
output gap (HP) (-1)	-0.121 (-0.40)	-0.096 (-0.38)	0.453 (0.82)	0.392 (0.67)	-0.166 (-0.44)	-0.121 (-0.36)	-0.197 (-0.58)	0.028 (0.09)	0.434 (0.96)	0.472 (1.11)
output gap (HP) (-1)*DUM(stabilization plan)			-0.780 (-1.28)	-0.660 (-1.05)					-0.984 (-1.81)	-0.729 (-1.49)
output gap(HP) (-1)*DUM(regime change)					0.171 (0.32)	0.093 (0.21)				
debt/gdp (-1)	-0.197 (-4.33)	-0.161 (-3.80)	-0.203 (-4.48)	-0.168 (-3.85)	-0.196 (-4.20)	-0.162 (-3.73)	-0.281 (-3.07)	0.025 (0.25)	-0.297 (-3.83)	-0.019 (-0.17)
long-run growth rate (d(output trend))		1.021 (2.60)		0.961 (2.39)		1.014 (2.60)		3.397 (3.35)		3.027 (2.95)
AR(1)	-0.014 (-0.15)	-0.069 (-0.695)	-0.036 (-0.32)	-0.084 (-0.71)	-0.017 (-0.19)	-0.071 (-0.71)	-0.064 (-0.54)	-0.099 (-0.82)	-0.112 (-0.82)	-0.130 (-0.89)
DUM(elections)										
R2	0.24	0.30	0.26	0.32	0.24	0.30	0.24	0.35	0.28	0.37
R2 ADJ	0.19	0.24	0.20	0.25	0.18	0.22	0.15	0.24	0.16	0.24
DW	2.09	2.15	2.17	2.22	2.09	2.15	2.06	2.31	2.20	2.42
Nº obs.	54	54	54	54	54	54	29	29	29	29
Estimation method	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)
c	0.106 (5.68)	0.051 (2.02)	0.108 (7.24)	0.053 (2.07)	0.104 (6.43)	0.055 (2.58)	0.164 (5.45)	-0.074 (-1.03)	0.164 (6.64)	-0.005 (-0.05)
output gap (HP) (-1)	-0.433 (-0.84)	-0.286 (-0.77)	0.959 (2.35)	1.024 (2.84)	-0.760 (-1.25)	-0.544 (-1.06)	-0.358 (-0.54)	-0.203 (-0.39)	1.12 (2.09)	1.260 (1.89)
output gap (HP) (-1)*DUM(stabilization plan)			-1.558 (-2.30)	-1.44 (-3.20)					-2.17 (-2.94)	-2.057 (-2.41)
output gap(HP) (-1)*DUM(regime change)					0.930 (1.31)	0.809 (1.30)				
debt/gdp (-1)	-0.139 (-2.54)	-0.108 (-2.44)	-0.182 (-4.67)	-0.122 (-3.02)	-0.134 (-2.63)	-0.111 (-2.45)	-0.332 (-4.32)	-0.072 (-0.85)	-0.350 (-6.29)	-0.171 (-1.57)
long-run growth rate (d(output trend))		0.993 (2.64)		0.946 (2.43)		0.905 (2.64)		2.724 (3.34)		1.952 (1.75)
AR(1)	-0.08 (-0.84)	-0.173 (-1.72)	-0.071 (-0.59)	-0.308 (-2.28)	-0.088 (-0.95)	-0.178 (-1.84)	-0.125 (-1.31)	-0.158 (-1.71)	-0.07 (-0.68)	-0.093 (-0.80)
DUM(elections)										
R2	0.16	0.23	0.23	0.18	0.14	0.21	0.22	0.32	0.20	0.27
R2 ADJ	0.11	0.17	0.16	0.09	0.07	0.13	0.13	0.21	0.06	0.11
DW	1.82	1.83	2.11	1.63	1.80	1.82	1.93	2.14	2.28	2.41
J-stats	0.045	0.041	0.049	0.037	0.049	0.085	0.056	0.047	0.037	0.037
Overid t-stats	2.43	2.214	2.646	1.998	2.646	4.59	1.624	1.363	1.073	1.073
Nº obs.	54	54	54	54	54	54	29	29	29	29

Period	1976-2000						
	11	12	13	14	15	16	17
Estimation method	OLS						
c	0.092 (6.57)	0.145 (2.51)	0.083 (4.85)	0.135 (2.58)	0.152 (3.14)	0.123 (2.15)	0.111 (1.93)
output gap (HP) (-1)	0.069 (0.22)	0.240 (0.61)	0.045 (0.16)	0.218 (0.57)	0.445 (1.04)	0.057 (0.13)	-0.066 (-0.17)
output gap(HP) (-1)*DUM(hard EMS 1987)					-0.401 (-0.59)		
output gap(HP) (-1)*DUM(join EMS 1990)						0.436 (0.62)	
output gap(HP) (-1)*DUM(Maastricht 1992)							1.552 (2.61)
debt/gdp (-1)	-0.144 (-3.63)	-0.141 (-3.64)	-0.142 (-3.56)	-0.138 (-3.59)	-0.136 (-3.37)	-0.139 (-3.47)	-0.129 (-3.50)
long-run growth rate (d(output trend))		-1.749 (-0.97)		-1.75 (-1.07)	-2.322 (-1.37)	-1.399 (-0.79)	-1.026 (-0.61)
AR(1)	-0.172 (-1.08)	-0.214 (-1.12)	-0.166 (-0.95)	-0.209 (-1.00)	0.221 (-1.031)	-0.217 (-1.01)	-0.259 (-1.13)
DUM(elections)			0.028 (1.31)	0.029 (1.27)	0.029 (1.22)	0.029 (1.31)	0.024 (1.07)
R2	0.34	0.36	0.40	0.42	0.43	0.43	0.49
R2 ADJ	0.24	0.23	0.28	0.27	0.24	0.24	0.33
DW	2.03	2.01	2.03	2.02	2.03	2.03	1.99
Nº obs.	25	25	25	25	25	25	25
Estimation method	IV (GMM)						
c	0.081 (6.16)	0.138 (2.45)	0.064 (5.13)	0.115 (2.22)	0.152 (2.57)	0.082 (1.18)	0.127 (2.37)
output gap (HP) (-1)	0.111 (0.41)	0.135 (0.40)	0.055 (0.24)	0.187 (0.59)	0.556 (1.11)	-0.074 (-0.16)	0.286 (0.71)
output gap(HP) (-1)*DUM(hard EMS 1987)					-0.590 (-0.86)		
output gap(HP) (-1)*DUM(join EMS 1990)						0.520 (0.68)	
output gap(HP) (-1)*DUM(Maastricht 1992)							-0.380 (-0.30)
debt/gdp (-1)	-0.104 (-2.66)	-0.111 (-2.54)	-0.092 (-3.00)	-0.095 (-2.95)	-0.086 (-2.35)	-0.106 (-3.23)	-0.093 (-2.97)
long-run growth rate (d(output trend))		-1.684 (-0.97)		-1.596 (-1.01)	-2.805 (-1.44)	-0.568 (-0.27)	-1.972 (-1.13)
AR(1)	-0.119 (-0.81)	-0.165 (-1.00)	-0.067 (-0.43)	-0.137 (-0.76)	-0.211 (-0.98)	-0.097 (-0.61)	-0.139 (-0.71)
DUM(elections)			0.044 (2.81)	0.044 (2.86)	0.042 (2.64)	0.046 (3.13)	0.045 (2.84)
R2	0.31	0.33	0.32	0.36	0.35	0.37	0.31
R2 ADJ	0.21	0.19	0.19	0.19	0.13	0.17	0.10
DW	2.06	2.00	2.12	2.07	1.88	2.20	2.00
J-stats	0.097	0.086	0.061	0.056	0.041	0.059	0.045
Overid t-stats	2.425	2.150	1.525	1.400	1.025	1.475	1.125
Nº obs.	25	25	25	25	25	25	25

Note. OLS estimates with Newey-West HAC standard errors and covariance. GMM estimates: instruments are lagged dependent and independent variables and the lagged HP-based output gap in the USA.

Table 3a Fiscal reaction functions Spain 1945-2000 annual data.		
Dependent variable increase in debt as a proportion of GDP (stabilisation plan dummies)		
Plan dummy	-0.055 (-2.24)	-0.050 (-1.96)
HP cycle(-1)* plan dummy	-0.480 (-2.66) instrumented	-0.436 (-2.28) instrumented
lagged debt ratio	-0.154 (-2.92)	-0.154 (-2.82)
Plan*lagged debt ratio	0.178 (3.11)	0.200 (3.47)
Franco dummy	0.017 (2.05)	-
R ²	0.50 (adj 0.45)	0.45 adj (0.40)
DW	1.80	1.65

Table 4
Reaction function benchmark estimates: PORTUGAL

DEPENDENT VARIABLE
d(log of real primary expenditure)

Period	1949-1995				1949-73			
	1	2	3	4	5	6	7	8
Estimation method	OLS							
c	0.099 (4.88)	0.054 (0.79)	0.099 (4.84)	0.059 (0.82)	0.11 (1.52)	0.076 (1.16)	0.153 (1.66)	0.117 (1.46)
output gap (HP) (-1)	0.949 (3.31)	0.984 (3.52)	0.821 (1.44)	-0.713 (-1.25)	-0.772 (-1.30)	-0.475 (-0.66)	0.361 (0.50)	0.397 (0.40)
output gap (HP) (-1)*DUM(colonial war)			0.192 (0.28)	1.962 (3.24)			-2.712 (-1.78)	-2.361 (-1.55)
output gap(HP) (-1)*DUM(revolution)								
output gap(HP) (-1)*DUM(IMF intervention 1979)								
output gap(HP) (-1)*DUM(IMF intervention 1983)								
output gap(HP) (-1)*DUM(hard EMS)								
debt/gdp (-1)	-0.094 (-2.41)	-0.061 (-0.95)	-0.084 (-1.82)	-0.056 (-0.86)	-0.251 (-0.69)	-0.470 (-1.14)	-0.465 (-1.04)	-0.644 (-1.47)
long-run growth rate (d(output trend))		0.783 (0.76)		0.543 (0.49)		1.589 (2.04)		1.41 (1.86)
AR(1)	0.135 (1.01)	0.113 (0.77)	0.136 (0.90)	0.173 (1.05)	-0.080 (-0.49)	-0.196 (-1.69)	-0.072 (-0.39)	-0.192 (-1.25)
DUM(elections)								
R2	0.28	0.28	0.28	0.36	0.06	0.17	0.19	0.28
R2 ADJ	0.23	0.22	0.21	0.28	0.00	0.01	0.03	0.09
DW	1.96	1.95	1.96	1.95	2.02	2.11	1.88	1.95
N° obs.	47	47	47	47	25	25	25	25

Estimation method	IV (GMM)	IV (GMM)						
	c	0.106 (6.10)	0.057 (0.82)	0.107 (2.63)	0.052 (0.72)	0.144 (1.56)	0.097 (1.41)	0.212 (0.96)
output gap (HP) (-1)	1.447 (2.48)	1.520 (2.80)	1.640 (0.20)	2.611 (0.43)	-1.058 (-0.49)	0.053 (0.02)	0.366 (0.19)	x
output gap (HP) (-1)*DUM(colonial war)							-4.492 (-0.22)	x
output gap(HP) (-1)*DUM(revolution)			-0.224 (-0.03)	-1.198 (-0.20)				
output gap(HP) (-1)*DUM(IMF intervention 1979)								
output gap(HP) (-1)*DUM(IMF intervention 1983)								
output gap(HP) (-1)*DUM(hard EMS)								
debt/gdp (-1)	-0.104 (-3.16)	-0.066 (-1.04)	-0.106 (-1.47)	-0.068 (-0.92)	-0.403 (-0.89)	-0.604 (-1.66)	-0.718 (-0.60)	x
long-run growth rate (d(output trend))		0.826 (0.79)		0.992 (0.90)		1.706 (2.59)		x
AR(1)	0.152 (1.20)	0.134 (0.98)	0.148 (0.75)	0.110 (0.76)	-0.103 (-0.60)	-0.232 (-1.67)	-0.135 (-0.81)	x
DUM(elections)								
R2	0.23	0.24	0.21	0.11	0.04	0.15	0.10	x
R2 ADJ	0.18	0.17	0.14	0.01	0.00	0.00	0.00	x
DW	1.98	1.98	1.99	2.01	1.96	2.05	1.67	x
J-stats	0.007	0.004	0.007	0.003	0.009	0.007	0.007	x
Overid t-stats	0.329	0.188	0.329	0.141	0.225	0.175	0.175	x
N° obs.	47	47	47	47	25	25	25	x

Period	1974-1995									
	9	10	11	12	13	14	15	16	17	18
Estimation method	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
c	0.191 (4.23)	-0.061 (-0.47)	0.209 (5.48)	-0.105 (-0.90)	0.195 (4.39)	-0.029 (-0.298)	0.196 (4.41)	-0.038 (-0.35)	0.182 (5.16)	-0.085 (-0.60)
output gap (HP) (-1)	1.047 (3.12)	0.962 (3.80)	1.028 (3.52)	0.250 (1.21)	0.998 (2.95)	0.270 (0.98)	1.038 (3.08)	0.707 (1.68)	1.121 (4.15)	1.033 (3.61)
output gap(HP) (-1)*DUM(IMF intervention 1979)			-0.403 (-2.37)	0.934 (3.31)						
output gap(HP) (-1)*DUM(IMF intervention 1983)					-0.215 (-0.95)	0.991 (3.57)				
output gap(HP) (-1)*DUM(hard EMS)							-0.255 (-1.04)	0.551 (1.13)		
debt/gdp (-1)	-0.246 (-2.96)	-0.139 (-2.10)	-0.278 (-4.00)	-0.127 (-2.40)	-0.258 (-3.12)	-0.163 (-3.52)	-0.264 (-3.17)	-0.163 (-3.29)	-0.241 (-3.90)	-0.126 (-2.02)
long-run growth rate (d(output trend))		6.069 (1.99)		7.242 (2.68)		5.564 (2.51)		5.682 (2.25)		6.351 (1.94)
AR(1)	0.184 (0.86)	0.109 (1.24)	0.122 (0.48)	-0.031 (-0.42)	0.166 (0.73)	-0.067 (-0.73)	0.17 (0.75)	0.022 (0.19)	0.205 (1.19)	0.105 (0.61)
DUM(elections)									0.018 (0.83)	0.022 (1.02)
R2	0.65	0.72	0.76	0.75	0.67	0.76	0.67	0.73	0.66	0.74
R2 ADJ	0.60	0.66	0.70	0.67	0.59	0.68	0.60	0.65	0.58	0.66
DW	1.66	2.00	1.72	2.01	1.65	2.06	1.66	2.07	1.64	2.01
N° obs.	22	22	22	22	22	22	22	22	22	22

Estimation method	IV (GMM)	IV (GMM)	IV (GMM)	IV (GMM)						
	c	0.193 (6.44)	-0.103 (-0.69)	0.192 (5.17)	-0.131 (-0.97)	0.203 (7.56)	0.013 (0.146)	0.175 (2.88)	-0.100 (-1.02)	0.197 (4.52)
output gap (HP) (-1)	1.015 (3.15)	0.905 (2.50)	1.262 (1.60)	-0.121 (-0.28)	0.997 (1.87)	0.143 (0.30)	1.272 (1.50)	0.696 (1.01)	1.003 (2.49)	x
output gap(HP) (-1)*DUM(IMF intervention 1979)			-0.256 (-0.24)	1.399 (2.88)						
output gap(HP) (-1)*DUM(IMF intervention 1983)					0.227 (0.33)	1.241 (2.01)				
output gap(HP) (-1)*DUM(hard EMS)							-0.674 (-0.452)	0.342 (0.382)		
debt/gdp (-1)	-0.247 (-4.67)	-0.120 (-1.60)	-0.241 (-3.63)	-0.114 (-1.91)	-0.256 (-5.46)	-0.177 (-4.21)	-0.216 (-1.93)	-0.127 (-2.82)	-0.235 (-4.19)	x
long-run growth rate (d(output trend))		7.102 (2.02)		7.876 (2.49)		4.551 (2.07)		7.069 (3.01)		x
AR(1)	0.160 (1.46)	0.134 (1.41)	0.162 (1.05)	-0.089 (-2.15)	0.065 (0.44)	-0.114 (-1.61)	0.270 (1.08)	0.069 (0.37)	0.048 (0.24)	x
DUM(elections)									-0.034 (-0.30)	x
R2	0.65	0.72	0.64	0.74	0.65	0.75	0.62	0.73	0.57	x
R2 ADJ	0.59	0.65	0.56	0.66	0.57	0.67	0.53	0.64	0.47	x
DW	1.64	2.02	1.66	1.98	1.53	2.00	1.62	2.04	1.72	x
J-stats	0.008	0.007	0.019	0.007	0.041	0.043	0.003	0.003	0.086	x
Overid t-stats	0.176	0.154	0.418	0.154	0.902	0.946	0.066	0.066	1.892	x
N° obs.	22	22	22	22	22	22	22	22	22	x

Note. OLS estimates with Newey-West HAC standard errors and covariance. GMM estimates: instruments are lagged dependent and independent variables and the lagged HP-based output gap in the USA.