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Economic Policy and Output Volatility in Spain, 1950–1998:

Was Fiscal Policy Destabilizing?

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ABSTRACT

Was Spanish fiscal policy destabilizing? We estimate policy reaction functions and test the impact of fiscal shocks on growth volatility over the period 1950–1998. We find that a transition from pro-cyclical to countercyclical fiscal policy occurred in the late years of the Franco regime, contributing to the stabilization of the growth pattern. The timing of the shift, between the late 1960s and early 1970s, was not determined by a single policy change, but rather by gradual pressure from economic liberalization, the external constraint imposed by a fixed exchange rate regime and the modernization of fiscal policy instruments. The aggressiveness of fiscal shocks also decreased over time, thus contributing to the progressive stabilization of output growth. There appears to be little necessity to appeal to a ‘Great Moderation’ of monetary policy to understand the greater stability of the Spanish economy from the 1980s

JEL Codes: E32, E62, N14

Keywords: fiscal reaction function, fiscal shocks, SVAR, growth volatility

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Introduction

Has fiscal policy been stabilizing or destabilizing? Has government spending and taxation smoothed or exacerbated the volatility of the growth process? Whether stabilizing or destabilizing, the rise of big government in the twentieth century almost certainly influenced fluctuations in economic activity. It follows that changes of economic or political regime may have altered the pattern of growth and its volatility. Indeed falling volatility (the so-called ‘Great Moderation’) has been observed in most industrialized countries over the last quarter of the 20th century. However, its connection with changes in the conduct of macroeconomic policy has been explored only in relation with monetary policy (Stock and Watson 2003). Indeed, empirical studies suggest that fiscal policy in both industrialized and developing countries has been much less countercyclical or acyclical (thus stabilizing) than suggested by either standard Keynesian models or Barro-type tax smoothing models (Fatás and Mihov 2008 and 2009).

This paper explores these questions and propositions for a half century of Spanish experience. Our concern is not only to assess whether fiscal policy increased or reduced output volatility but also to establish whether it did so systematically so that fiscal policy regimes can be identified in the form of reaction functions.

In the case of Spain, fiscal policy is especially prominent since monetary policy emerged later than in most of the rest of Western Europe as an autonomous instrument of economic policy. During the 1950s, the central bank guaranteed unconditional liquidity to the government and the public sector through the automatic discount of public debt. This policy was discontinued only in 1962, when the Bank of Spain was nationalised and put under the control of the Ministry of Finance, but quantitative credit schemes remained the main instrument of monetary intervention and the monetary base was hardly managed (Poveda 1972). Only in 1973 did monetary policy come of age, with broad money and then private sector liquidity used as intermediate target, and bank reserves as the instrumental target (replaced by short-term interest rate after 1984) (Aríztegui 1990; Ayuso and Escrivá 1998). However, recent studies (Gadea et al. 2008; Bajo Rubio et al. 2010) contend that fiscal dominance (a regime under which fiscal deficits determine the path of money creation and the sustainability of fiscal policy is

achieved through adjustments in the price level) prevailed for most of the postwar period, and was not clearly reversed until the 1990s, when the Bank of Spain gained formal independence.

Even so, little attention has been paid to the contribution of fiscal policy to Spanish macroeconomic volatility in the period of most rapid economic growth, the quarter of century after 1950. For the post-1980 period, some studies suggest that fiscal policy stabilised private consumption and output growth, mainly thanks to an expansion of welfare provisions and the increasing size of the public sector (Dolado et al. 1993, Gómez 1993, Marín 1997). In the other direction, De Castro (2003) estimated that for the period 1980-2001, government spending shocks were the most important exogenous source of output volatility, explaining 15 per cent of GDP variance at a one-year horizon.

Our original contribution is threefold. First, we provide a much longer perspective on the conduct of fiscal policy than the current empirical literature, which usually is limited to the post-1970 period. Second, we shed light on changes in fiscal behaviour of governments in the transition from autocracy to democracy, thus contributing to the literature on fiscal policy under authoritarian polities. Third, we uncover shifts in fiscal policy regimes and provide empirical evidence of their impact on output volatility over time. In so doing we offer an alternative to the ‘Great Moderation’ of monetary policy as an explanation for the enhanced stability of the Spanish economy from the 1980s.

Section 1 outlines the conceptual framework of the paper and surveys the existing literature. Section 2 discusses the history and institutions of Spanish fiscal policy in the years 1950 to 1998. Section 3 empirically estimates government’s reaction functions—that is, the impulse-response dynamics of fiscal policy and output—using both a Structural VAR framework and an instrumental variable approach. Section 4 focuses on the time-varying magnitude of discretionary fiscal shocks and measures their impact on growth volatility.

1. Fiscal policy and the cycle: theory and empirical literature

Growth cycles may be represented as the response of the economy to a series of random shocks. Most instability originates on the demand side of the economy, which fiscal policy both influences and reacts to. Three elements of fiscal policy can be distinguished: *a cyclical, non-discretionary component*, determined by automatic stabilizers such as tax revenues (pro-cyclical) or unemployment benefits (countercyclical); *a discretionary and systematic component*, that is, deliberate and systematic responses of the government to the state of the economy; and *a discretionary and non-systematic component*, that is, budget decisions not related to economic fluctuations. Any of the three components can be responsible for a change in the growth cycle pattern.

Fiscal policy influences growth volatility primarily through structural features of the fiscal regime. These structural characteristics include the size of the public sector, and therefore the proportion of GDP devoted to public spending and taxation, and the composition of tax receipts and expenditures. A small government sector has a smaller stabilising or destabilising impact, other things being equal. Modern fiscal regimes, based on a progressive tax system and large spending on unemployment benefits and other subsidies related to economic fluctuations, exhibit greater stabilizing properties than regimes with regressive taxation and spending concentrated on government purchases (van den Noord et al. 2000, pp. 6-8; Andrés et al. 2007). In fact Gali (1994) finds a significant stabilizing effect of government size on GDP variability in a sample of OECD countries in the period 1960-90 as do Fatás and Mihov (2001) for a similar sample and period, after controlling for additional factors such as international openness. More recent studies suggest that the stabilizing effect of government size may have significantly declined since the 1980s (Mohanty and Zampolli 2009). The latter evidence is consistent with the decline of fiscal multipliers observed by Perotti (2005).

The second element, systematic discretionary responses to cyclical fluctuations, can be modelled by ‘reaction functions’ (Fatás and Mihov 2003) or ‘fiscal rules’ (Gali and Perotti 2003). Non-systematic discretionary changes are “fiscal shocks”, that is, changes in the fiscal stance that are exogenous to the economy and to built-in characteristics of the tax and spending process (such as implicit or explicit rules and the institutional

arrangements). Denoting g as the growth of real government spending (net of automatic stabilizers), and y as output and demand growth, the discretionary systematic component of policy is measured by the parameter c in the reaction function

$$g = c_1 (y - y^*) + u_g \quad (1)$$

where y^* is a target output growth, y is the realized (or expected) growth rate, and non-systematic discretionary changes in spending are represented by u_g , which are ‘political shocks’.

The impact of fiscal policy is through an aggregate demand or, say, an IS function, where u_y represents demand shocks;

$$y = b(g) + u_y \quad (2)$$

Substituting the reaction function in the IS function, growth of spending is dampened when $c_1 < 0$; discretionary policy is stabilising. When $c_1 > 0$ aggregate demand growth is reinforced by government expenditure; policy exacerbates cyclical fluctuations. Figure 1 illustrates.

FIGURE 1 HERE

A positive demand shock, such as a rise in the demand for exports, shifts the IS or aggregate demand function upwards in figure 1. A boom begins but fiscal policy reaction is to stabilise, so g is cut back and short run output expansion is less than in the absence of reaction. A reaction function with the opposite gradient represents a destabilising government. In the long run increased government spending has no effect on output or aggregate demand (as a first approximation – ignoring possible crowding out of productive investment), because it is simply redistributive.

In the model of figure 1, long run fiscal equilibrium in a static economy requires that taxes cover government spending including debt service. Otherwise debt is accumulating or decumulating, which is not sustainable in the long run. We assume tax revenues adjust somehow. The impact of the government spending change depends upon these taxes. But in the short run on the reaction function the government can run up or run down debt as necessary. The IS, aggregate demand or impact function, how spending affects income and output, assumes tax revenues are endogenous, part of the

function. The impact of spending on income is less the larger is the marginal propensity to pay taxes. Greater ‘automatic stabilisation’ reduces the gradient of the impact function in figure 1. Tax shocks are subsumed in shocks to income or output.

Government systematic policy might be stabilising but non-systematic discretionary policy may still increase the volatility of output growth. Figure 1 can be manipulated to show these shocks shifting the reaction function and exercising a stronger short run effect on output, the steeper is the impact function. The more ‘aggressive’ is discretionary non-systematic fiscal policy, the greater the amplitude of shifts in the reaction function and of the business cycle.

As far as the relationship between the fiscal stance of the government and fluctuations of the economy is concerned, empirical studies show that over the last forty years fiscal policy was persistently pro-cyclical in developing countries, thus adding to their macroeconomic instability. The traditional explanation of pro-cyclicality is that fiscal policy suffers from substantial lags in recognition, action and effects, thus affecting the economy when the circumstances that triggered a change in the fiscal stance have vanished (Stein 1969). Recent studies suggest, on the contrary, that booms enhance governments’ ability to borrow and therefore to spend (Gavin and Perotti 1997; Kaminsky et al. 2004). Others argue that spending pressures increase during expansions due to political distortions created by high tax base volatility (Talvi and Végh 2005) or by voters’ demand in corrupted political systems (Alesina et al. 2008).

A complementary hypothesis is the “voracity effect”. Institutional conditions such as political fragmentation may tend to intensify lobbying and the struggle between power blocs for the appropriation of fiscal revenues during economic booms, when revenues become more abundant (Lane and Tornell 1996; Tornell and Lane 1999; Lane 2003). Government spending and deficits may be expected to rise with the upswing of the cycle in regimes that must assuage influential pressure groups (unions, big business, the army, religious bodies, regional separatists) to remain in power. Moreover for insecure governments information flows can be attenuated because open policy debate becomes subversive if the ‘wrong’ conclusions might be reached. So spending increases excessively without being questioned until an external crisis intervenes and forces painful cutbacks. By contrast politically stable regimes may be 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 automatic stabilising role of the tax system with rates unchanged is likely to be more prominent than spending changes. Such regimes will show acyclical or countercyclical fiscal policies.

The evidence for OECD countries is mixed on the contrary. Acyclical or countercyclical fiscal policy seems to have characterized large industrial countries (Kaminski et al. 2004; Alesina et al. 2008).¹ However, other studies suggest that procyclicality prevailed in industrialized countries outside the G7 group (Arreaza et al. 1999; Lane 2003). In turn Fatas and Mihov (2009) find that procyclicality was common in EMU countries before the introduction of the Euro. In fact results seem to be rather sensitive to the variable used to capture fiscal stance, as well as to the sample of countries and the time span covered by different studies.

Fiscal impact may also depend upon the exchange rate regime. In standard models of small open economies with nominal rigidities under a pegged nominal exchange rate with liberalized capital movements demand management becomes the main tool through which a government influences inflation (Marston 1985). Under fixed rates fiscal expansion beyond full capacity could trigger a capital outflow in the absence of capital controls, bringing the policy to a stop. At below full capacity fiscal policy is an effective determinant of aggregate demand; fiscal expansion expands the domestic money supply by capital inflows. Under flexible rates with spare capacity, fiscal expansion appreciates the exchange rate which, by reducing competitiveness eventually offsets the original demand expansion. Beyond equilibrium output, fiscal expansion induces inflation, depreciating the exchange rate which boosts demand further. Without the exchange rate constraint, fiscal policy can seriously destabilise the economy. An additional and important implication is that the fiscal stance becomes a key determinant of the credibility of a fixed exchange rate. A stabilizing fiscal policy can therefore be considered as an indirect commitment to an announced exchange rate peg, reinforcing its credibility (Andersen and Chiriaeva 2007).

¹ Alesina et al. (2008, p. 1007) define a policy countercyclical when it adjusts to the tax-smoothing principle of constant tax rates and discretionary government spending as a fraction of GDP over the cycle. This corresponds to what Kaminsky et al. (2004) regard as an acyclical policy.

2. Fiscal policy in the transition from autocracy to democracy: a narrative

As argued in the previous section, three components of fiscal policy may contribute to its stabilizing or destabilizing properties: the size of automatic stabilizers (determined by the structure of expenditures and taxation), systematic responses to the state of the economy, and policy shocks. In turn, discretionary fiscal decisions (both systematic and non-systematic) can be influenced by the incentives and constraints created by the political economy and the exchange rate regime. In this section we describe the profound changes that altered the Spanish fiscal regime in the transition from autocracy to democracy. The objective of our narrative is to identify if, how and when, according to the existing literature and to contemporary observers, Spanish fiscal policy acted as a stabilizing or destabilizing force, and to what extent this was related to political changes.

Until the early 1970s, Franco's fiscal regime exhibited characteristics that made it unsuitable for short-term demand management and left little scope for stabilizing action. The size of government was small and automatic stabilizers virtually absent. As Figure 2 shows, tax revenues and spending of the central government remained below 15 per cent of GDP.²

FIGURE 2 HERE

Indirect taxation (articulated in a cumulative multiphase tax on sales, taxes on luxury goods and excises) accounted for two thirds of total receipts on average, while an additional 15 percent of receipts came from import taxes. Tax reforms in 1957 and 1964 failed to expand the tax base and modernize its structure, and receipts from direct taxation remained below 30 per cent of total tax revenues. The transition towards a modern, unified social security system began only in 1967 and was completed as late as 1972, when social security contributions finally outweighed indirect taxes as the main source of revenues. Tax collection was weakened by the internal fragmentation of the

² However government spending was also passing through a myriad of public bodies and administrations (Argimón et al. 1999, p.52). A World Bank (1963) team identified in 1962 over 1,600 autonomous official spending units with less than perfect reporting standards, and was obliged to confine their discussion of Spanish public expenditure to central government spending, the only category for which they could obtain data.

administration, widespread exemptions, ‘tax farming’, and rampant evasion and avoidance (Fuentes Quintana 1990, pp. 129-30; Canseco 1978, pp. 145-160; Gunther 1980, pp. 57-61; Argimón et al. 1999, pp. 51-63; Comín 2007, pp. 12-21).

As pointed out by an OECD study, attempts to limit private consumption during expansionary cycles by increasing indirect taxes tended to fuel inflationary pressure on prices and wages, and the low share of direct taxes reduced considerably the role of the budget as an automatic stabilizer.³ Moreover the administration delegated assessment of the tax base to trade and professional groups, which caused persistent underestimation and reduced the responsiveness of tax revenue to changes in the state of the economy (OECD, January 1970, pp. 54-55).⁴

Spending in turn was heavily biased towards government consumption. Wages, purchases and current transfers represented more than 60 per cent of total central government expenditure (almost 80 per cent in the 1950s). Indicative planning in the 1960s triggered a significant expansion of gross capital formation thanks to public investment in housing and infrastructures, together with capital transfers in favour of public companies. On the other hand, spending on welfare schemes remained negligible and mainly oriented towards retirement benefits, family allowances and contributions to households’ medical spending (García Delgado 1982).

A second problem was poor fiscal institutions. These were dominated by ‘revenue budgeting’, the rigidity of which was meant to control bureaucratic behaviour. Enquiries carried out in the last years of the autocratic regime uncovered poor economic information and systematic lack of coordination due to the ‘historic, monolithic self-sufficiency of the Spanish ministries’. Developmental industrial policy based on French-style planning failed to discipline and coordinate budget spending with investment plans of INI and other autonomous bodies (Anderson 1970, pp. 73-4 and 203-33; Medhurst 1973, pp. 160-165). Forecasts of economic trends, tax revenues and spending, and estimates of budget’s impact on domestic demand were neither centralized nor published. Biannual budgeting was too inflexible to be used for demand

³ The study was carried out in 1969 in response to the Report “Fiscal Policy for a Balanced Economy”, prepared by a group of OECD experts in 1968.

⁴ Estimated income liable from the tax on individuals in 1957 was at least double that recorded by the tax authorities, according to the World Bank (1963, p. 117).

management, and the systematic use of supplementary and extraordinary expenditures made actual spending substantially diverge from spending targets (OECD, January 1970, pp. 50-52).

A third destabilizing characteristic of fiscal policy under Franco was a political economy which tended to generate pro-cyclical spending. The regime has been described as ‘a personalist authoritarian no-party political system...which tolerated a limited pluralism in which the conflicting demands of certain social groups (especially those which supported the regime) could be articulated by prominent individuals’ (Gunther 1980, p. 32). Policy-making within the Franco cabinets was dominated by coalitional politics, under which policy resulted from compromises between different factions and power contenders. Until the late 1960s, economic policy-making was shaped by the permanent tug of war between the ‘Falangist’ faction, which dominated syndicates (partly autonomous from the government) and was influential in state-controlled companies, and the Europe-minded technocrats who favoured liberalization and a market-oriented policy.

Until the late 1960s, booms tended to be exacerbated by expansionary fiscal policies. The economic buoyancy initiated in 1955 triggered mounting pressure by syndicates for a ‘more equitable distribution of national income’, while rising prices created social upheaval and repeated waves of strikes (EIU, n. 19, September 1956). The Falangist faction gained influence in the cabinet reshuffle of April 1956, and a populist increase in nominal wages in the public and private sectors was immediately decreed by the Ministry of Labour, triggering a classical wage-price spiral. Fiscal policy maintained an expansionary stance, and investment plans by INI, completely funded by the issue of public debt, peaked in 1957 (Schwartz and González 1978, pp. 81-82). Pressures in favour of a retrenchment of government spending were part of the anti-inflationary policy pursued by the liberal technocrats responsible for economic policy (Navarro Rubio and Ullastres). Early in 1958 government funding of INI was suspended and ordinary spending frozen, but public investment and capital transfers still increased by 27 per cent over the previous year (EIU, Annual Supplement, July 1959). The budget deficit rose to 2 per cent of GDP, annual inflation hit 12 per cent, and a current account deficit emerged due to massive imports of raw materials, and consumption and capital goods. By early 1959 domestic and external imbalances had virtually eliminated foreign

exchange reserves and required international assistance (Carreras and Tafunell 2004, pp. 319-24). The stabilization of the economy, enforced by the liberal technocrats under the supervision of the OECD, dictated a strong fiscal adjustment to eliminate excess internal demand, which exacerbated the ongoing recession (OECD, August 1960, p. 20).

The Stabilization Plan failed to eradicate this pro-cyclical bias. Fiscal discipline was again abandoned over the long expansionary cycle of 1961-66, which saw the implementation of the first Development Plan. Rapid growth of public sector expenditures remained a critical component of excess domestic demand (OECD, July 1966, pp. 15-23). Massive public investment in the housing sector was paralleled by a boom of private spending, and large transfers from the Treasury to official credit institutions fuelled a credit boom. Nominal annual growth of total public spending peaked over 20 per cent in 1964-65, with investment and capital transfers accounting for one third of it (Beltrán and Oliart, 1967, pp. 69-70). By 1965 excess domestic demand had pushed inflation back to the 1958 levels, forcing the government to pursue an anti-inflationary policy based on quantitative constraints on the annual expansion of domestic credit (EIU, n. 3, August 1966). Even the Bank of Spain, under the leadership of Navarro Rubio, a liberal technocrat and a former Minister of Finance, openly criticized the fiscal authorities in its annual reports, contending that “far from acting as a stabilizing factor, the public sector has tended to behave even more expansively the more inflationary trends made themselves felt” (BDE 1965 and 1966). Pressure from international organizations for fiscal restraint were compounded by increasing opposition by the business community to an anti-inflationary policy based exclusively on a credit squeeze which threatened to curb private investment and consumption indiscriminately. In fact, the government eventually delivered an austerity package—including restraint in spending, increases in taxes on profits and luxury consumption, and a freezing of wages, prices and dividends—in coincidence with the Peseta devaluation of November 1967, even at the cost of aggravating the ongoing slowdown in private investment (EIU, n. 3, August 1967, and n. 4, December 1967; OECD, January 1969, pp. 16-18).

The stabilization episode of 1967 consolidated the influence of the liberal technocrats and inclined the dispute over growth vs. macroeconomic stability in their favour. A

transition towards a different approach to fiscal policy finally emerged and new instruments of countercyclical intervention were also introduced. In 1969 a French-style automatic trip system was adopted, under which official action was required in case of excess growth of price indices, domestic credit and unemployment (or excess fall in international reserves or industrial production) (EIU, n. 1, February 1969). Unlike previous booms, fiscal restraint was maintained during the 1969-70 expansion in order to prevent overheating of the economy, against fast growth of money supply and new inflationary pressures. This policy succeeded in moderating demand growth and contributed to reverse a mounting current account deficit and expectations of a new devaluation of the Peseta (OECD, January 1971, pp. 5-15). When domestic demand weakened in the first half of 1971, the government switched to reflationary measures, including a massive increase in government spending for public investment and transfers to official credit institutions and tax rebates on private investment (EIU, n. 3, August 1971; OECD, January 1972, p. 14). The year 1971 marked another peak in government deficit (2.8 per cent of GDP); the same year saw also the first issue of public debt aiming at financing fiscal expansion with explicit countercyclical objectives, in response to a substantial drop of economic activity and a significant expansion of social security spending (Canseco 1978; Argimón et al. 1999, p. 55).

Fiscal policy was finally modernized. In 1972 the government adopted annual budgeting and created special funds for investment projects (mostly in public works) available for immediate disbursement in case of alarming slack in domestic demand (EIU, n.1, January 1974). Fiscal stance in 1973-74 remained expansionary, with tax cuts on production and increasing subsidies to firms, in response to a slowdown in economic activity, aggravated by the reversal in expectations caused by the first oil shock (Argimón et al. 1999, p. 63). This countercyclical action was estimated to have offset two thirds of the contractionary pressure from the international crisis (Galy et al. 1993, p. 4), although inflation hovered around 15 per cent both in 1974 and 1975. By the start of the democratic transition, both the practice and the instruments of countercyclical fiscal policy seemed well established among Spanish authorities.

Democratization marked a rapid transition from small to big government, a new political economy set-up and the definite modernization of fiscal institutions, though not without conflicts and delays. Social pressure in favour of a rapid reduction of the huge

gap in welfare provisions suffered by the Spanish population relative to European standards proved irresistible. A rapid convergence of social spending (including unemployment benefits) towards European levels was negotiated between the new democratic government, entrepreneurial organizations and labour unions under a neo-corporatist agreement, the so called 'Moncloa Pacts' of 1977, in return for wage moderation. Together with welfare programmes, a substantial expansion of subsidies to private and public companies as means of favouring the conversion of the obsolete industrial sector, kept the rise of government expenditures well above the increase in tax revenues. On the other hand, public investment and capital transfers were gradually marginalized (González Páramo 1990; Valle 1990).

The 1977-78 tax reform introduced a progressive income tax for individuals and companies. However the modernization of the tax administration and the struggle to reduce tax frauds were embraced half-heartedly by the weak centrist governments of 1979-82, and gained momentum only after the Socialist victory in the 1982 elections. Reform of indirect taxation was opposed by business organizations and the introduction of a modern value added tax was delayed until 1986 (Fuentes Quintana 1990, pp. 478-502; Comín 2007, pp. 24-40; for an overview, Martínez Vázquez and Sanz-Sanz 2007).

A new budget act, approved in 1977, introduced three fundamental innovations in the instrumentation of fiscal policy: consolidated and refined accounts for the public sector, better coordination of investment by state-owned bodies with the government budget, and forecasting models of tax revenue (Canseco 1978, pp. 197-203). However, controls on public spending focused on procedural correctness, and evaluation and policy planning had to wait until the early 1980s, when budgets by programmes were introduced (Zapico Goñi 1988).

The almost uninterrupted fiscal expansion of the decade 1975-85 moved countercyclically to the long depression suffered by the Spanish economy until the mid 1980s, during which the contraction of private investment and the depression of domestic demand pushed unemployment from 8.6 percent in 1979 to 21.5 percent in 1985 (Vázquez 1990). The stimulus provided by the public sector was meant partially to offset the impact on activity and employment of an increasingly restrictive monetary policy whose aim was to bring down inflation from the 20 per cent peak hit in 1977 and

make a fixed exchange rate sustainable (OECD, April 1979, pp. 20-21, and May 1981, pp. 19-20).⁵

Fiscal expansion was reversed abruptly in 1985-86, coinciding with the accession to the EEC and the start of a new expansionary cycle of the economy. At the same time the pegged-but-adjustable exchange rate regime created by the European Monetary System had gained credibility and joining the Exchange Rate Mechanism of the system became a political priority for the Spanish government. Economic recovery facilitated countercyclical fiscal adjustment. Spending growth subsided and the tax burden increased thanks to the introduction of VAT and marginal reforms of income taxation. Official pegging of the Peseta to the Deutschmark was successfully achieved in 1989, just at the peak of the expansionary cycle, with a 6 percent fluctuation band, and maintained in the following two years, allowing Spain to sign the Maastricht Treaty at the end of 1991. Capital liberalization was part of the package, but what made a difference was fiscal adjustment and economic policy coordination within the framework of the hard EMS.

To sum up, since the early 1970s the stabilizing properties of fiscal policy were enhanced by the introduction of automatic stabilizers, the modernization of fiscal institutions, changes in the interaction between the government and interest groups, and the discipline imposed by a pegged exchange rate. In the next section, we test empirically these hypotheses.

3. Estimating fiscal reaction functions: a tale of two regimes

The previous narrative suggests that changes in the structural characteristics of the fiscal regime enhanced over time the stabilizing properties of fiscal policy and its use for

⁵ In fact, after the emergency devaluations of 1976 and 1977, the Spanish governments showed a persistent ‘fear of floating’. Reinhart and Rogoff (2004) classify the Peseta exchange rate as a de facto 2 per cent crawling band around the US dollar between 1973 and 1980, and around the Deutschmark until 1994. Ledesma et al. (2005) also find that a de facto peg to the Deutschmark prevailed between 1978 and 1984, and again between 1986 and the 1993 crisis, and was temporarily abandoned only in 1985 in response to speculative attacks in the wake of Spain’s accession to the EEC. These results strongly suggest that Spanish monetary authorities worried about the pass-through from exchange rates to prices and systematically intervened to smooth fluctuations in the nominal exchange rate, even in the absence of a formal commitment to peg.

countercyclical purposes. Here we test formally whether fiscal policy contributed to the stabilization of the growth process by focusing on fiscal reaction functions (fiscal rules), that is, the discretionary and systematic response of governments to changes in the state of the economy.

The most widely used indicator of the fiscal stance of the government is the cyclically adjusted GDP ratio of the primary balance, which allows to identify fiscal rules and shocks by eliminating the fully endogenous component of fiscal policy (Gali and Perotti 2003; Fatas and Mihov 2009). Cyclical adjustment, however, requires precise and country-specific estimates of the elasticity of different categories of taxes and unemployment spending to cyclical fluctuations, constructed on the base of tax codes and the distribution of taxpayers—an information not available for Spain until the late 1970s and hardly applicable backward due to the profound changes in the tax system in 1977.⁶ Moreover, Kaminsky et al. (2004, pp. 7-9) demonstrate that the cyclical policy cannot be assessed unambiguously whenever the real primary balance or its GDP ratio are used.⁷ To address this problem, other studies (Lane 2003; Fatás and Mihov 2008) contend that pure ‘instruments’ of fiscal policy, such as real spending, are better able to capture the fiscal stance of the government and to discriminate between pro-cyclical (magnifying), countercyclical (stabilizing) and a-cyclical policies.

For this reason, we use real primary spending of the central government net of social security expenditures as our indicator of the fiscal stance of the government. The exclusion of interest payments and unemployment benefits guarantees that, whatever cyclical behaviour we might observe, this measure should depend on discretionary responses, not on automatic stabilizers. Our main indicator of the state of the economy

⁶ Elasticities cannot be obtained by regressing tax revenues on output, since taxes have certainly a contemporaneous effect on output, especially at annual frequency, and estimates would be inconsistent. Elasticities estimated by the OECD for the 1980s and 90s are reported in van den Noord (2002). However, estimates of potential or trend output, as well as the systematic distortions introduced by estimated tax and spending elasticities in the cyclically-adjusted balances are controversial issues (Alberola et al. 2003; Mohr and Morris 2007).

⁷ 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.

is the industrial production index. A particularly useful characteristic of industrial output is that, unlike real GDP (whose annual official estimates became available only in the early 1960s), it was observable both at annual and quarterly frequency by contemporary economic and political actors since the 1950s.⁸ (See Appendix for details on data and sources)

Our benchmark approach to estimating the stabilising or destabilising impact of fiscal policy is to identify the reaction function by the shocks to a SVAR. Here we distinguish two types of structural shocks to identify the two functions, impact and reaction. One is a shock to the ‘impact’ equation (2), determining how output (aggregate supply and non-fiscal aggregate demand) responds to the fiscal variable (u_y). The other is a shock to the reaction function (1), shifting the response of the fiscal variable to output (u_g). We observe reduced form shocks (e_{it}) to the fiscal variable and output from which the structural shocks are then inferred.

In a two variable model consisting of the change in government spending g and the change in output y , the reduced-form VAR can be represented as

$$\begin{bmatrix} g_t \\ y_t \end{bmatrix} = \begin{bmatrix} A_{11}(L) & A_{12}(L) \\ A_{21}(L) & A_{22}(L) \end{bmatrix} \begin{bmatrix} g_{t-1} \\ y_{t-1} \end{bmatrix} + \begin{bmatrix} e_{gt} \\ e_{yt} \end{bmatrix} \quad (3)$$

where $A_{ij}(L)$ is the autoregressive lag polynomial, and e_{gt} and e_{yt} , the reduced form shocks, are linear combinations of the structural shocks u_t . The structural form of model (6) can be expressed as

$$\begin{bmatrix} g_t \\ y_t \end{bmatrix} = \begin{bmatrix} B_{11}(L) & B_{12}(L) \\ B_{21}(L) & B_{22}(L) \end{bmatrix} \begin{bmatrix} u_{gt} \\ u_{yt} \end{bmatrix} \quad (4)$$

⁸ According to Prados de la Escosura (2003, pp. 203-205), the share of the industrial and constructions sector on total GDP at current prices hovered around 35 per cent for the whole period 1952-86. Its contribution to real GDP growth decreased from 50-55 per cent in 1952-74 to ca. 33 per cent in the late 1980s. We prefer the industrial production index reported by INE (Instituto Nacional de Estadística) and international organizations such as the IMF (see Appendix for details) to the historical series of real GDP and industrial production reconstructed by Prados de la Escosura since the former was observable by the government and economic agents, and is also comparable with industrial productions indices of other European countries reported by IMF.

Given that there exists a linear relationship between the observable and the structural residuals, $e_t = Cu_t$, the structural shocks u_t can be identified by first estimating the reduced form VAR and then transforming e_{gt}, e_{yt} .

Identification of these relations requires the introduction of one additional restriction on the matrix C , apart from the three short-run restrictions that structural innovations u_{it} are orthonormal. We adopt the long-run restriction of Blanchard and Quah (1989) imposing that there is no long-run influence of pure innovations in the fiscal variable (g_t) on aggregate demand or output growth (y_t). We can rewrite the reduced form innovations:

$$\begin{bmatrix} e_{gt} \\ e_{yt} \end{bmatrix} = \begin{bmatrix} c(1) & c(2) \\ 0 & c(3) \end{bmatrix} \begin{bmatrix} u_{gt} \\ u_{yt} \end{bmatrix} \quad (5)$$

Coefficients $c(i)$ of matrix C represent the long-run response pattern of the variables to these two structural shocks. In particular $c(2)$ represents the long-run cumulative response of the fiscal variable, government spending, to a u_y shock. A positive coefficient $c(2)$ indicates a destabilising fiscal reaction function, as an unanticipated boost to aggregate demand is matched by an increase in government expenditure. Alternatively, a negative coefficient denotes countercyclical behaviour of fiscal policy.

Table 1 shows the estimates of the coefficients for the SVAR (g, y) before and after the transition to democracy. Consistently with our narrative, we find that the parameter capturing the cumulative response of primary spending to a structural output shock is positive and significant at the 5 per cent level under Franco, denoting pro-cyclicality, but turns countercyclical during the democratic period (negative and significant at 1 per cent level). As a robustness check, we repeat the analysis using quarterly data, available for government spending only from 1962 (see Appendix). Results based on this larger sample confirm a change in the sign of the spending reaction function. Estimates of the SVAR for different subperiods of the democratic era—before and after 1989, the date of entry of the Peseta into the European Monetary System—suggests a stronger countercyclical response in the later period.

TABLE 1 HERE

A word of caution about the timing of the transition from pro- to counter-cyclicality is warranted however. Any change in the reaction function will not become apparent until sufficient cyclical behaviour of the economy has occurred to identify it. We could thus infer that the change must have occurred prior to 1975. In order to explore this issue, we estimate the SVAR and the reaction function parameter recursively. Figure 3 reveals the time pattern of the shift in the spending response of the government from destabilising to stabilising. The sudden loss of significance in the transition from the late 1960s to the early 1970s clearly suggests a change in the reaction function. Such change coincides chronologically with the process of modernization of fiscal policy identified in our narrative.

FIGURE 3 HERE

A more explicit assessment of whether the automatic stabilising properties of the tax function offset any destabilising government spending behaviour requires an extension to the model. No longer is taxation a part of the aggregate demand, impact or IS function. We assume that the spending decisions come first, and only afterwards do tax revenues follow them. So tax revenues depend eventually upon government spending, as well as on the tax base - income or output here. Government spending, as before is a reaction function, determined by output or income. In the short run the impact equation has a steeper gradient than in figure 1 because it does not include the effects of taxation. In the long run, output or income is independent of both taxation and government spending, which must be in some sort of equilibrium⁹

More formally, three long-run additional restrictions are required to identify a system with a tax reaction function as well as the government spending function and aggregate demand. These are:

- no long-run effect on output growth of a government spending shock
- no long-run effect on output growth of a structural shock to tax revenues, u_T
- no long-run effect on government spending of a shock to tax revenues u_T .

⁹ In a growing economy the stability of the debt-gdp ratio depends upon the growth rate of the economy as well as upon the deficit or surplus.

With these restrictions imposed the relation between the observed and the structural residuals is:

$$\begin{pmatrix} e_g \\ e_T \\ e_y \end{pmatrix} = \begin{pmatrix} c(1) & 0 & c(4) \\ c(2) & c(3) & c(5) \\ 0 & 0 & c(6) \end{pmatrix} \begin{pmatrix} u_g \\ u_T \\ u_y \end{pmatrix}$$

If $c(4) < 0$ the fiscal reaction function is stabilizing. $C(2)$ the response of tax revenues to government spending in the long run must be positive to be stabilising, as must be $c(5)$, the response of tax revenues to the tax base. $C3$ is tax shocks. Could these be destabilising? This depends on their timing and their impact on debt accumulation. A positive tax shock coefficient probably increases the stability of the system by reducing debt accumulation, whereas a negative effect – implying predominant tax cuts – is likely to be destabilising in the face of expansionary government spending.

Table 2 confirms the previous results; primary spending reacts procyclically before the mid 1970s seventies and counter-cyclically afterwards. The positive and significant $c(5)$ parameter is consistent with a stabilising contribution of the revenue side of the fiscal reaction function, though we cannot tell whether it is ‘automatic’ or discretionary policy¹⁰.

TABLE 2 HERE

A different approach, from the SVAR identification to the potential contemporaneous feedback from fiscal policy through aggregate demand to output is the method of instrumental variables (Gali and Perotti 2003; Alesina et al. 2008). We specify the following reaction function:

$$g_t = c + \alpha y_t + \beta R y_t + u_g \quad (7)$$

where g is the growth rate of (log) real primary spending (net of unemployment benefits), R is a dummy capturing a change in the fiscal policy regime, y is the growth rate of (log) industrial production; and $u_g = \sum \rho_i u_{t-i} + \varepsilon_t$. Parameter α is the elasticity of

¹⁰ As Kaminsky et al. (2004) note, only if a negative $C(5)$ parameter is obtained can a (destabilising) discretionary tax policy be identified. A positive coefficient potentially reflects two types of behaviour.

spending to output and $\alpha > 0$ connotes a pro-cyclical reaction function. Parameter β is a measure of the impact of a new fiscal policy regime on the spending response to output. $\beta < 0$ indicates that the new regime reduces the pro-cyclicity of spending. Finally, residuals ε are white-noise innovations that are orthogonal to the state of the economy and determine the overall volatility of the fiscal stance. The dispersion of these shocks, σ^ε , measures the aggressiveness of idiosyncratic or non-systematic changes in fiscal policy (Fatás and Mihov 2008). A desirable feature of this approach is that it allows us to avoid breaking the sample in sub-periods and estimate fiscal shocks adjusted to shifting reaction functions for the whole period 1950-1998. To address potential endogeneity problems between spending and output, we estimate equation (7) by GMM and use the contemporaneous and lagged growth rate of industrial output in core European economies as instruments for domestic output.¹¹ Results are presented in Table 3.

TABLE 3 HERE

Since our initial hypothesis was to test whether there was a change in the cyclical fiscal stance of the government across political regimes, we first introduce a ‘democracy’ dummy, taking the value of 1 after the conclusion of the democratic transition in 1976. Again we find that democratic governments brought in a significant fall in procyclicality (column 2). However, our narrative reveals that institutional rather than political regime changes could have determined the policy shift to countercyclicality. Therefore we test a set of additional dummies to capture the impact of a variety of possibly relevant factors. These include: the stabilisation plan (taking value 1 after 1960), the adoption of annual budgeting and the creation of countercyclical funds (1 after 1972), Spain’s accession to EEC (1 after 1986), and the peseta’s entry into the Exchange Rate Mechanism of the EMS (1 after 1989). In principle, the two last events should have ‘tied’ the hands of the Spanish governments, thus reducing their scope for

¹¹ The instrumental variable is a weighted industrial production index of five ‘core’ European economies (France, West Germany, the Netherlands, Belgium and the UK). The first stage regression has good explanatory power (R^2 0.47) with coefficients and t-stats: 0.622 (2.56**) and 0.768 (4.01***) of contemporaneous and lagged foreign output growth, respectively. Unit root tests confirm that the series are stationary. Autoregressive lags are selected on the base of standard (Akaike and Schwartz) criteria.

countercyclical discretionary fiscal policy. However, a government losing discretionary monetary policy may make increasing use of fiscal policy for stabilisation.

Consistently with the narrative and the previous SVAR findings, our results suggest that the changes introduced in fiscal policy during the Franco regime in the early 1970s—rather than the transition from autocracy to democracy—proved critical to reduce its pro-cyclicality (column 3). Joining the EMS in 1989, rather than the accession to EEC, apparently accounts for most of the countercyclical behaviour observed under the democratic regime (columns 4 and 5). Including a double countercyclical shift in the early 1970s and at the end of the 1980s yields consistent results and maximizes the explanatory power of our specification (column 6). This evidence confirms that the loss of discretion in the use of monetary policy indeed led to a more energetic use of fiscal policy, in line with Gali and Perotti's (2003, pp. 17-18) finding for all EMU countries in the post-Maastricht period.

These findings are robust to the use of quarterly data. The identification of a double countercyclical shift in fiscal policy is confirmed (column 7). Also, assuming a backward looking behaviour, in which governments, given the inertia and complexity of fiscal policy-making, responded to lagged fluctuations of the economy, does not change the results (column 8). Additionally, we test the hypothesis of fiscal policy being constrained by the level of outstanding government debt. In order to do so, we control for the lag of debt-GDP ratio in equation (7), which then becomes 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). In fact, in spite of evidence in favour of debt-constrained spending policy, the double shift to countercyclicality is confirmed (column 9). The same holds if we introduce election year dummies, which capture the possible existence of political budget cycles. Indeed we find evidence of significant political effects in fiscal policy (column 10). These results suggest that fiscal shocks were in part politically-driven and are consistent with the literature which argues in favour of political budget cycles in “young” democracies (Brender and Drazen 2005).¹²

¹² Election year dummies are specified as 1 in the four quarters prior to a general election (including the quarter in which the election took place). We test for political budget cycles only

4. The attenuation of fiscal shocks

We finally turn to the role played by the ‘aggressiveness’ of fiscal policy. Our objective is to test whether and to what extent discretionary fiscal shocks (u_g) contributed to the volatility of the output process. Starting with the SVAR analysis, we first estimate the percentage of the variance of industrial production due to the structural fiscal shocks. As shown in Figure 4, the contribution of both spending and tax shocks to output volatility was maximized in the 1960s and declined significantly since the mid 1970s. The results suggest that fiscal (and especially spending) shocks were a significant determinant of growth volatility during the Franco period.

FIGURE 4 HERE

The aggressiveness of fiscal shocks can be measured more precisely by the residuals of the IV equation (7). We retrieve spending shocks from specification (6) of Table 3 in the previous section. We also retrieve tax shocks—that is, changes in tax revenues not related to the state of the economy—from a similar regression.¹³ As shown in Figure 5, discretionary fiscal policy unrelated to the state of the economy was much more aggressive and volatile in the 1950s and the first half of the 1960s, than in the subsequent period. The model successfully identifies the large positive spending shocks and negative tax shocks that led to the 1959 crisis and the fiscal adjustment dictated by the stabilization plan of 1960-61. Data also uncover a destabilizing pattern typical of the Franco regime until the mid 1960s, under which positive (negative) spending shocks were systematically magnified by discretionary tax cuts (increases). This pattern was subsequently abandoned, with spending and tax shocks generally moving in the same direction, although not with equal magnitude. The long period of fiscal expansion that prevailed until the early 1980s was nevertheless characterized by relatively moderate

using quarterly data because most Spanish elections were held in the first half of the year, so that an annual dummy would capture both pre- and post-election fiscal shocks. An additional problem with annual dummies is the limited number of observations and the absence of sufficient degrees of freedom.

¹³ In this case, the cyclical parameter captures both the automatic and the discretionary systematic component of tax revenues. We find a value very close to 1 (0.874, p-value 0.000). Dummies for the tax reforms of 1964 and 1977 are not statistically significant.

shocks with much lower volatility. The aggressiveness of discretionary fiscal policy increased during the fiscal adjustment of the second half of the 1980s and early 1990s.

FIGURE 5 HERE

In order empirically to test whether and to what extent changes over time in the “aggressiveness” of discretionary fiscal policy contributed to output volatility, a model of growth volatility must be specified. Recent empirical studies use ARCH or GARCH models, where output growth is a standard autoregressive process and the conditional variance of growth depends on past volatility and forecast variance. Fiscal shocks are then entered as explanatory variables of the conditional variance (Badinger 2006).

As argued in recent studies however (Cecchetti et al. 2006; Fang et al. 2008; Fang and Miller 2009), the assumption of a stable GARCH process may prove unwarranted if there are structural changes in mean growth or in growth volatility. Therefore we control for structural breaks in the μ , the underlying growth rate, of the following mean equation

$$\Delta y_t = \mu + \rho \sum \Delta y_{t-i} + \varepsilon_t \quad (8)$$

where y is the (log) of the industrial production index, ρ is a persistence parameter, Δ is a first difference operator, i indicates time lags, and ε is a white-noise error with variance σ_ε .¹⁴ A structural break test unequivocally identifies a shift in the mean of the growth process in 1975, consistent with the standard narrative of Spanish economic performance (Marcet and Ravn 2004: 9-11),¹⁵ and heteroskedasticity tests of the residuals reject the hypothesis of constant variance.¹⁶

Equation (9) is the one-period ahead forecast variance

$$\sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2 + \varphi \text{shocks}^2 \quad (9)$$

¹⁴ Lag selection Akaike and Schwartz criteria suggest an AR(2) process.

¹⁵ A Quandt-Andrews test of unknown break point reports maximum LR F-statistics in 1975 with 33.34 value and 0.000 p-value.

¹⁶ Residuals exhibit some negative skewness (-0.425) and excess kurtosis (3.861), but p-values of empirical distribution tests confirm normality. Ljung-Box Q-statistics and Breusch-Godfrey tests reject serial correlation. On the contrary, White, Harvey and Glejser tests reject homoskedasticity with probability of F-stat 0.0767, 0.0475, and 0.0374 respectively. A BDS (Brock, Dechert, Scheinkman) test of independence also rejects the hypothesis of independent and identically distributed residuals.

where the conditional variance of output growth, σ_t^2 , is dependent on the information set available in the previous period (Ω_{t-1}), α is the ARCH parameter for lagged squared residuals, β a GARCH parameter for lagged forecast variance, and Φ a parameter capturing the impact of the volatility of fiscal shocks on the conditional volatility of the growth process.¹⁷ We find no ARCH effects but highly persistent conditional variance. As shown in Figure 6, the declining pattern of growth conditional variance tracks the falling “aggressiveness” of purely discretionary fiscal shocks in the transition from the 1960s to the 1970s.

FIGURE 6 HERE

The high persistence of the GARCH process may signal the existence of a structural shift in growth variance. Recursive estimates of the ω parameter confirm its instability, and an unknown breakpoint test reveals the existence of a structural break in 1965 (Figure 7, left hand panel). Therefore we alternatively specify a Component-GARCH (C-GARCH) model of output growth, in which the constant ‘ ω ’ is replaced by a time-varying parameter, m , allowing for shifting long-run volatility:

$$\sigma_t^2 = m + \alpha (\varepsilon_{t-1}^2 - m_{t-1}) + \beta (\sigma_{t-1}^2 - m_{t-1}) \quad (10)$$

$$m = \omega + \chi (m_{t-1} - \omega) + \psi (\varepsilon_{t-1}^2 - \sigma_{t-1}^2) \quad (11)$$

where (10) represents a transitory component of volatility converging to zero with powers $(\alpha+\beta)$, and (11) a long-term component converging to zero with powers of ρ . As shown in the right hand panel of Figure 7, the model adequately captures the downward transition of the permanent component of volatility from the 1960s to the 1970s, and provides clear evidence of heteroscedasticity in the transitory component and its stabilization in the second half of the 1960s.

FIGURE 7 HERE

To test for the impact of the aggressiveness of fiscal policy on growth, we include squared fiscal shocks as independent variable in the variance equation of both the GARCH and the C-GARCH model. Table 4 shows the results.

¹⁷ Conditions $\alpha, \beta \geq 0$, and $\alpha+\beta$ (a measure of the persistence of shocks to conditional variance) < 1 must hold to ensure positive and stable conditional variance.

TABLE 4 HERE

In the case of GARCH, both spending and tax shocks have a positive impact on variance and enter equation (5) at the 1 per cent level of significance.¹⁸ In the C-GARCH model, fiscal shocks enter positively and significantly in the permanent component of growth volatility, although with a smaller magnitude of their parameters. These results confirm that part of the high volatility of output growth before the mid-1960s was due to strong fiscal shocks, and that the subsequent moderation of discretionary fiscal policy contributed to a structural stabilization of the output growth process.

Conclusion

Was fiscal policy destabilizing? Yes it was during most of the Franco period, both because of the policy reaction function and because of the ‘aggressiveness’ of discretionary fiscal shocks. By the mid seventies systematic fiscal policy had turned stabilising and the volatility of fiscal shocks had radically diminished. After 1989, and entry to the EMS, there is evidence that the stabilising properties of the reaction function increased. This was accompanied by a slight increase in the aggressiveness of fiscal shocks, probably because of the fiscal adjustment necessary to satisfy the convergence criteria. On balance, for Spain we think it would be incorrect to attribute the greater stability of the economy from the 1980s to a ‘Great Moderation’ of monetary policy.

Our analytical narrative emphasises the key structural elements that shaped the time-varying impact of fiscal policy on output fluctuations: expanding government, greater progressiveness of taxation, and wider coverage as well generosity of welfare provisions, suggest that the automatic stabilizing role of fiscal policy should have increased over time. Other factors contributed to diminish the impact of discretionary spending shocks on the economy: first, the progressive shift of government expenditures away from spending categories with a relatively higher fiscal multiplier,

¹⁸ As a robustness check we also specify the mean equation in two slightly different ways: $\Delta y_t = \mu + \varepsilon_t$, with $\varepsilon_t = \rho_i \sum \varepsilon_{t-i} + v_t$. The results do not change.

such as investment and capital transfers; second, the increasing openness of the Spanish economy, with substantial leakages towards imports.

We also find that in the Spanish case a transition to countercyclical policy occurred in the late years of the Franco's regime, contributing to the stabilization of the growth pattern. The timing of the shift, between the late 1960s and early 1970s, was not determined by a single policy change, but rather by gradual pressure from economic liberalization, the external constraint imposed by a fixed exchange rate regime and the modernization of fiscal policy's instruments. We finally provide evidence that the magnitude of discretionary fiscal shocks decreased over time, thus contributing to the progressive stabilization of output growth.

APPENDIX: Data and sources

Fiscal variables

Annual

Estadísticas Históricas de España. Siglos XIX-XX, A. Carreras, X. Tafunell, eds. (Fundación BBVA, 2005), c. 12, F. Comín, D. Diaz, “Sector público administrativo y estado del bienestar”, vol. II, pp. 873-964

Central government tax revenues:

1950-61, Table 12.16 “Ingresos del Estado: clasificación económica”, p. 940 [includes: indirect and direct tax revenue, monopolies, other current revenue (transfers among public administrations and other current transfers), capital tax revenues].

1962-98, Table 12.21 “Estado: ingresos corrientes y de capital (movimiento de caja), clasificación económica”, p. 948 [includes: indirect and direct tax revenue, current and capital transfers, interest revenue, dividends and other]. This series corresponds to the data reported in *IMF International Financial Statistics*, “Total revenue and grants”, ifs:s18481y.zf.

Central government expenditures:

1950-61, Table 12.17 “Gastos del Estado: clasificación económica”, p. 943.

1962-98, Table 12.22 “Estado: gastos corrientes y de capital (movimiento de caja), clasificación económica”, p. 949 [includes wages, purchases, current and capital transfers, investment, interest payments, other expenditures]. This series corresponds (with minor discrepancies) to the data reported in *IMF International Financial Statistics*, “Expenditures” (net of lending and repayments), ifs:s18482zfa.

Social security: 1958-98, Table 12.31 “Cuentas de la Seguridad Social”, pp. 958-59

Government debt: 1950-98, Table 12.34 “Deuda pública en circulación”, pp. 962-63.

Quarterly

IMF International Financial Statistics

Central government tax revenues (1962Q1-1998Q4): ifs: s18481zfq

Central government expenditures (1962Q1-1998Q4): ifs: s18482zfq

Government debt (1958Q3-1998Q4): ifs: s18488zfq

Wholesale Price Index

Annual

IMF International Financial Statistics (1950-1998): ifs: s18463zf

Quarterly

IMF International Financial Statistics (1959Q1-1998Q4): ifs: s18463zfq

Industrial Production Index

Annual

Spain (1950-1998): *Estadísticas Históricas de España. Siglos XIX-XX*, A. Carreras, X. Tafunell, eds. (Fundación BBVA, 2005), c. 5, A. Carreras, “Industria”, vol. I, pp. 357-964, Table 5.11 “Índices de la producción industrial”, Series INE (Instituto Nacional de Estadística). This series tracks (with minor discrepancies) the industrial production index (s.a.) reported from 1960 by *IMF International Financial Statistics*, ifs: s18466czfa.

France, Germany, the Netherlands, Belgium and UK (1950-1998): *IMF International Financial Statistics*, ifs: s13266czf, s13466czf, s13866czf, s12466bzf, s11266czf, respectively.

Quarterly

Spain: *IMF International Financial Statistics* (1961Q1-1998Q4): ifs: s18466czfq

France, Germany, the Netherlands, Belgium and UK (1957Q1-1998Q4): *IMF International Financial Statistics*, s13266czfq, s13466czfq, s13866czfq, s12466bzf, s11266czfq, respectively.

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SOURCES

EIU = The Economist Intelligence Unit, Quarterly Economic Reviews: Spain

OECD = OECD Economic Surveys: Spain

BDE = Banco de España Annual Reports

BIBLIOGRAPHICAL REFERENCES

Alberola, E., González-Mínguez, J.M., Hernández De Cos, P., Marqués, J.M. (2003), How cyclical do cyclically-adjusted balances remain? An EU study, *Hacienda Pública Española/Revista de Economía Pública*, 166, n. 3, pp. 151-181

Alesina, A., Campante F.R., Tabellini, G. (2008), Why is fiscal policy often procyclical?, *Journal of the European Economic Association*, 6(5), pp. 1006-1036

Andersen, T. M., Chiriaeva, J. (2007), Exchange rate pegs, fiscal policy, and credibility, *Open Economic Review*, 18, pp. 53-76

Anderson, C. W. (1970), *The Political Economy of Modern Spain. Policy-Making in an Authoritarian System*. Madison and London: The University of Wisconsin Press

Andrés, J., Domenech, R., A. (2008), The stabilizing role of government size, *Journal of Economic Dynamics and Control*, 32, n. 2, pp. 571-593

Argimón, I., Gómez Ángel, L., Hernández De Cos, P., Martí, F. (1999), El sector de las administraciones publicas en España, *Estudios Económicos*, Banco de España, n. 68

Aríztegui, F.J. (1990), La política monetaria, en J.L. García Delgado, ed., *España, Economía*. Madrid: Espasa Calpe, pp. 903-926

Arreaza, A., Sorensen, B.E., Yosha, O. (1999). Consumption smoothing through fiscal policy in OECD and EU countries., in: Poterba, J.M., von Hagen, J. (dds.), *Fiscal Institutions and Fiscal Performance*. University of Chicago Press, Chicago, IL, pp. 59– 80

Ayuso, J., Escrivá, J. L. (1998). Trends in the monetary policy strategy in Spain, in J. L. Malo de Molina, J. Vinals, & F. Gutierrez (Eds.), *Monetary policy and inflation in Spain*. New York: St. Martin's Press, pp. 131-158

- Badinger, H. (2006), 'Fiscal shocks, output dynamics and macroeconomic stability: an empirical assessment for Austria (1983-2002)'. *Empirica*, 33, pp. 267-284
- Bajo-Rubio, O., Díaz-Roldán, C., Esteve, V. (2010), Government deficit sustainability and monetary versus fiscal dominance: the case of Spain 1850-2000, Working Papers on International Economics and Finance, DEFI 10-04
- Beltrán, L., Oliart, A. (1967), *Gasto Público en España*. Madrid
- Blanchard, O.J., Quah, D. (1989), The dynamic effects of aggregate demand and supply disturbances, *The American Economic Review*, 79, n. 4, pp. 655-673
- Blanchard, O. J., Simon, J. (2001), The long and large decline of U.S. output volatility, *Brookings Papers on Economic Activity*, 32, n. 1, pp. 135-174
- Brender, A., Drazen, A. (2005), Political budget cycles in new versus established democracies, *Journal of Monetary Economics*, 52, n. 7, 1271-1295
- Calvo, G., Reinhart, C. (2002), Fear of floating', *Quarterly Journal of Economics*, 117, n. 2, pp. 379-408.
- Canseco Canseco, J.E. (1978), *Política fiscal de España: estudio de la política económica pública española desde el plan de estabilización*. Madrid, Instituto de Estudios Fiscales
- Carreras, A. (2005). "Industria", in *Estadísticas Históricas de España. Siglos XIX-XX*. Bilbao: Fundación BBVA, Vol. I, pp. 357-453.
- Carreras, A., Tafunell, X. (2004), *Historia económica de la España contemporánea*. Barcelona: Crítica
- Cecchetti, S., Flores Lagunes, A., Krause, S. (2006), Assessing the sources of changes in the volatility of real growth, in C. Kent, D. Norman (eds.), *The Changing Nature of the Business Cycle*. Reserve Bank of Australia Annual Volume, pp. 115-138
- Comín, F. (2007), Reaching a political consensus: The Moncloa Pacts, joining the European Union, and the rest of the journey, in J. Martínez-Vazquez, J.F. Sanz-Sanz (eds.), *Fiscal Reform in Spain. Accomplishments and Challenges*. Cheltenham: Edward Elgar, pp. 8-58
- De Castro, F. (2003), The macroeconomic effects of fiscal policy in Spain, Banco de España, Documento de Trabajo n. 0311.
- Dolado J.J., Sebastián M., Vallés J. (1993), Cyclical patterns of the Spanish economy, *Investigaciones Económicas*, 17 (3): 445-473
- Fang, W-S., Miller S.M., Lee C-S. (2008), Cross-country evidence on output growth volatility: nonstationary variance and Garch models, *Scottish Journal of Political Economy*, 55, n. 4, pp. 509-541
- Fang, W-S., Miller S.M. (2009), Modeling the volatility of real GDP growth: the case of Japan revisited, *Japan and the World Economy*, 21 (3), pp. 312-324
- Fatás, A., Mihov I. (2001), 'Government size and automatic stabilizers: international and intranational evidence', *Journal of International Economics*, 55, p. 3-28
- Fatás, A., Mihov, I. (2003), The case for restricting fiscal policy discretion, *The Quarterly Journal of Economics*. 118 (4), pp. 1419-1447
- Fatás, A., Mihov, I. (2008), Fiscal discipline, volatility and growth, in T. Irwin, G. Perry, L. Servén, R. Suescún (eds.), *Fiscal Policy, Stabilization and Growth. Prudence or Abstinence?* Washington: World Bank, pp. 43-74
- Fatás, A., Mihov, I. (2009), The Euro and fiscal policy, NBER Working paper, n. 14722
- Fuentes Quintana, E. (1990), *Las Reformas Tributarias en España*. Barcelona, Crítica

- Gadea M.D., Sabaté M., Escario R. (2008), "Beating fiscal dominance. The case of Spain, 1874-1998", Documento de Trabajo n.8, Universidad de Zaragoza
- Gali, J. (1994), 'Government size and macroeconomic stability', *European Economic Review*, 38, 117-132
- Gali, J., Perotti, R. (2003). Fiscal policy and monetary integration in Europe, *Economic Policy*, 18, pp. 533-572
- Galy, M., Pastor, G., Pujol, T. (1993), *Spain: Converging with the European Community*. Washington: IMF
- García Delgado, J.L. (1982), ed., *Economía Española: 1960-1980*. Madrid: Blume
- García Delgado, J.L., Serrano Sanz, J.M. (1990), De la primera crisis energética a las elecciones del 77: tiempo de incertidumbre, en J.L. García Delgado, ed., *Economía Española de la Transición y la Democracia*. Madrid: CIS, pp. 3-21.
- Gavin, M., Perotti, R. (1997), Fiscal policy in Latin America, in B. Bernanke, J. Rotemberg, eds., *NBER Macroeconomics Annual 1997*. Harvard, Mass.: MIT Press
- Gómez Giménez, A. L. (1993), Indicadores de la política fiscal: una aplicación al caso español, Documento de Trabajo n. 9304, Servicio de Estudios, Banco de España
- Gómez Giménez, A. L., Roldan Alegre, J. M. (1995), Análisis de la política fiscal en España con una perspectiva macroeconómica (1988-1994), Banco de España, Estudios Económicos, n. 53
- González Páramo, J. M. (1990), Tres lustros de cambios estructurales en el sector público, en J.L. García Delgado, ed., *Economía Española de la Transición y la Democracia*. Madrid: CIS, pp. 245-271
- Gunther, R. (1980), *Public policy in a no-party state: Spanish planning and budgeting in the twilight of the Franquist era*. Berkeley: The University of California Press
- Kaminsky, G., Reinhart, C., Végh, C. (2004), When it rains it pours: procyclical capital flows and macroeconomic policies, in M. Gertler, K. Rogoff, eds., *NBER Macroeconomic Annual 2004*. Harvard, Mass: MIT Press
- Lane, P.R., Tornell, A. (1996), Power, growth and the voracity effect, *Journal of Economic Growth*, 1, pp. 213– 241
- Lane, P. R. (2003), The cyclical behavior of fiscal policy: evidence from the OECD, *Journal of Public Economics*, 87, pp. 1661–1675
- Ledesma Rodríguez, F., Navarro-Ibáñez, M., Pérez Rodríguez, J., Sosvilla Rivero, S. (2005), Implicit regimes for the Spanish peseta/Deutschmark exchange rate, Fedea Documentos de Trabajo, n. 2005-21
- Marcet, A., Ravn, M. (2004), The HP-filer in cross-country comparisons, CEPR Discussion Paper, n. 4244
- Marín, J. (1996), Efectos estabilizadores de la política fiscal, Estudios Económicos, n. 58, Servicio de Estudios, Banco de España
- Marston, R. C. (1985), Stabilization policies in open economies, in R.W. Jones, P.B. Kenen, eds., *Handbook of International Economics*. Amsterdam-New York-London: New Holland, vol. 2, pp. 859-916.
- Martínez-Vázquez, J., Sanz-Sanz J. F. (1990), eds., *Fiscal Reform in Spain. Accomplishments and Challenges*. Cheltenham: Edward Elgar
- Medhurst, K. N. (1973), *Government in Spain. The Executive At Work*. Oxford: Pergamon Press

- Mohanty, M.S., Zampolli, F. (2009), Government size and macroeconomic stability, *BIS Quarterly Review*, (December,) pp. 55-68
- Mohr, M., Morris, R. (2007), Uncertainty in Measuring the underlying budgetary position and fiscal stance, Paper presented at the Directorate General for Economic and financial Affairs 2008 workshop "*Achieving & safeguarding sound fiscal positions*", European Commission, Brussels
- Perotti, R. (2005), Estimating the effects of fiscal policy in OECD countries, Proceedings, Federal Reserve Bank of San Francisco, March
- Poveda, R. (1972), *La Creación de Dinero en España*. Madrid, Instituto de Estudios Fiscales
- Prados de la Escosura, L. (2003). *El Progreso Económico de España (1850-2000)*. Bilbao: Fundación BBVA
- Ravn, M., Uhlig, H. (2002), On adjusting the Hodrick-Prescott filter for the frequency of observations, *The Review of Economics and Statistics*, 84 (2), pp. 371–380
- Reinhart, C., Rogoff, K. (2004), The modern history of exchange rate arrangements: a reinterpretation, *Quarterly Journal of Economics*, 119, pp. 1-48, Data Appendix
- Schwartz, P., Gonzalez M-J. (1978), *Una Historia del Instituto Nacional de Industria (1941-1976)*. Madrid: Tecnos
- Stein, H. (1969), *The Fiscal Revolution in America*. Chicago: University of Chicago Press
- Stock, J., and M. Watson (2003), Has the business cycle changed and why, in M. Gertler, K. Rogoff, eds., *NBER Macroeconomics Annual 2002*, 17, pp. 159-218
- Talvi, E., Vegh, C. (2005), Tax base variability and procyclicality of fiscal policy, *Journal of Development Economics*, 78, pp. 156–190
- Tornell, A., Lane, P. R. (1999), Voracity and growth, *American Economic Review*, 89, pp. 22–46
- Valle, V. (1990), El gasto público en España, en E. Albi Ibañez, ed., *La Hacienda Pública en la Democracia*. Barcelona: Ariel, pp. 170-179.
- Vázquez Juan, A. (1990), Crisis, cambio y recuperación industrial, en J.L. Garcia Delgado, ed., *Economía Española de la Transición y la Democracia*. Madrid: CIS, pp. 81-117.
- Van den Noord, P. (2000), The size and role of automatic fiscal stabilizers in the 1990s and beyond, OECD Economics Department Working Papers, n. 230
- Wyplosz, C. (2002), Fiscal policy: institutions versus rules, CEPR Discussion Paper, n. 3238

TABLES AND FIGURES

Figure 1
Fiscal Reaction Functions

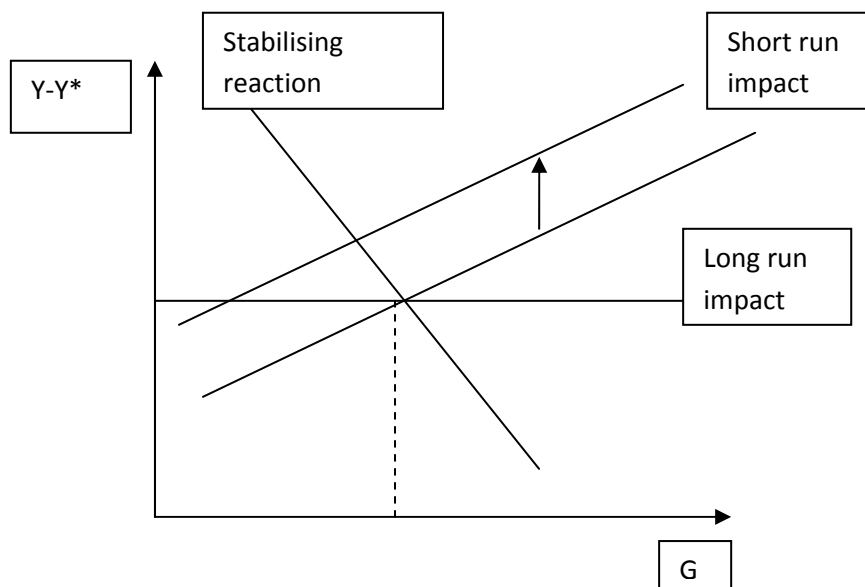
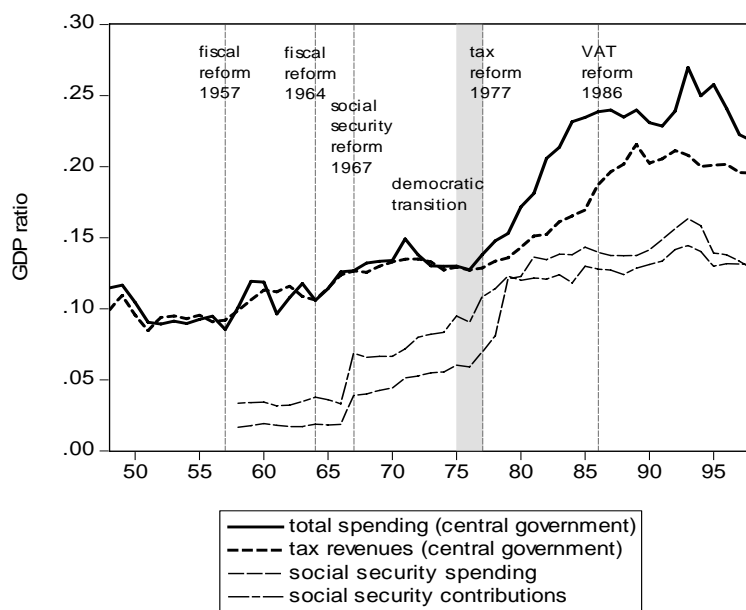
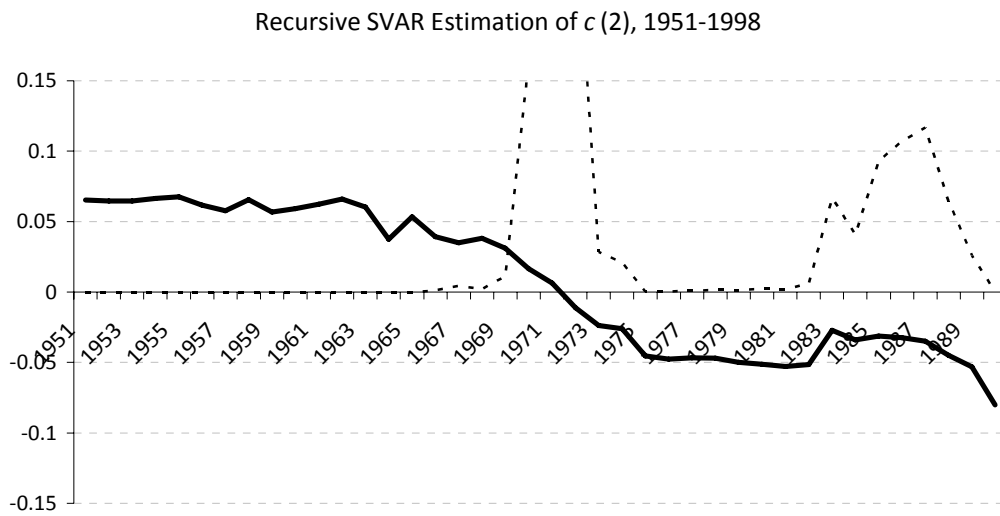


Figure 2
The historical evolution of the Spanish fiscal regime, 1950-1998



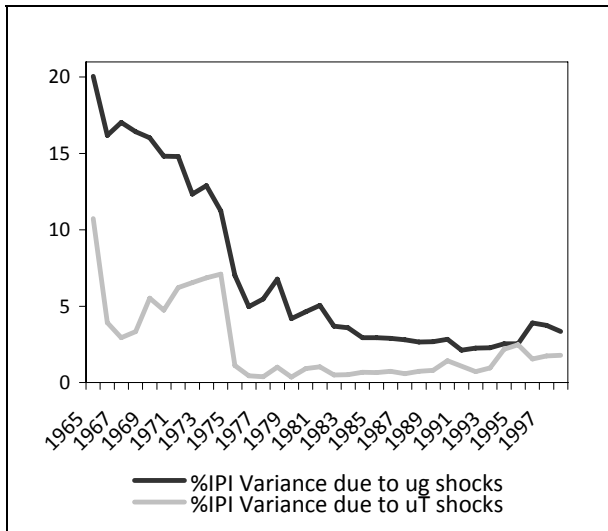
Notes. Fiscal data and sources: see Appendix. Nominal GDP from Prados de la Escosura (2003).

Figure 3
Shifting reaction function



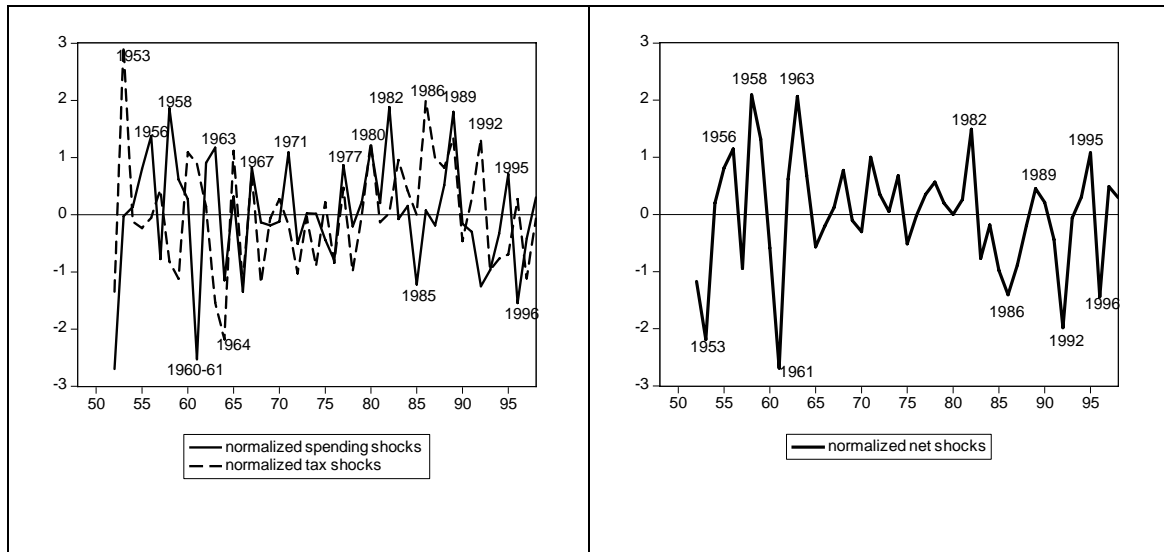
Note. See Table 1. Recursive estimation starting with the whole sample and gradually focusing in the last years by eliminating the first ones (1951-1998... 1990-1998). P-value: discontinuous line.

Figure 4
Recursive estimate of IPI-growth variance decomposition



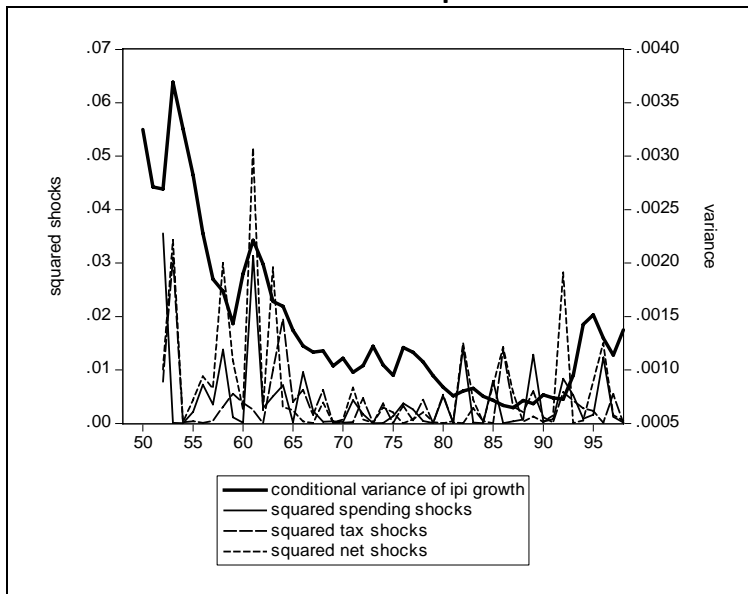
Notes. Recursive estimates based on bivariate SVARs ($\Delta exp, \Delta IPI$) and ($\Delta rev, \Delta IPI$) with annual data and 2 lags at a 5-year horizon. A recursive estimate based on trivariate SVAR ($\Delta exp, \Delta rev, \Delta IPI$) gives the same results.

Figure 5
Discretionary fiscal shocks



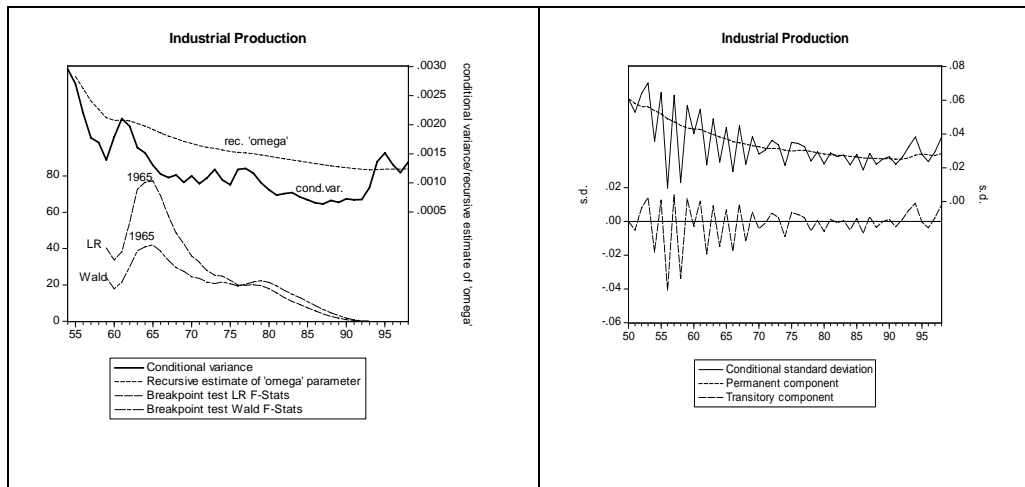
Notes. Normalized spending and tax shocks are residuals from instrumental variable (GMM) estimates of central government's reaction functions for primary spending and tax revenues, respectively. Net shocks are spending shocks minus tax shocks. Data and sources: see Appendix.

Figure 6
Fiscal shocks and conditional output variance



Notes. Conditional variance obtained from a GARCH model of industrial output growth. Fiscal shocks are squared residuals of instrumental variable estimates of reaction function (see Figure 5). Data and sources: see Appendix.

Figure 7
A C-GARCH model of industrial output growth



Data and sources: see Appendix.

Table 1
Fiscal reaction functions: bivariate SVAR

SVAR ($\Delta exp, \Delta IPI$) – Annual data	c(1)	c(2)	c(3)
	LR acc response of Δexp to u_g shocks	LR acc response of Δexp to u_y shocks	LR acc response of ΔIPI to u_y shocks
1951-1975	0.050 (0.0000)	0.024 (0.0247)	0.046 (0.0000)
1976-1998	0.055 (0.0000)	-0.048 (0.0004)	0.039 (0.0000)
SVAR ($\Delta exp, \Delta IPI$) – Quarterly data	c(1)	c(2)	c(3)
	LR acc response of Δexp to u_g shocks	LR acc response of Δexp to u_y shocks	LR acc response of ΔIPI to u_y shocks
1964:2-1975:4	0.032 (0.0000)	0.025 (0.0000)	0.023 (0.0000)
1976:1-1998:4	0.030 (0.0000)	-0.012 (0.0002)	0.017 (0.0000)
1976:1-1989:4	0.029 (0.0000)	-0.009 (0.0256)	0.015 (0.0000)
1990:1-1998:4	0.009 (0.0000)	-0.019 (0.0000)	0.026 (0.0000)

Notes. Unit root tests (not reported) confirm that the series are stationary. Annual data with 2 lags; quarterly data (only available since 1962) with 8 lags; autoregressive lags are selected on the base of Akaike and Schwarz criteria; p-values in parentheses. Data and sources: see Appendix.

Table 2
Fiscal reaction function: trivariate SVAR

Tri-SVAR ($\Delta exp, \Delta taxrev, \Delta IPI$)	c(1)	c(2)	c(3)	c(4)	c(5)	c(6)
	LR acc response of Δexp to a u_g shock	LR acc response of $\Delta taxrev$ to a u_g shock	LR acc response of $\Delta taxrev$ to a u_y shock	LR acc response of Δexp to a u_y shock	LR acc response of $\Delta taxrev$ to a u_y shock	LR acc response of ΔIPI to a u_y shock
1951-1975	0.048 (0.0000)	0.018 (0.0221)	0.038 (0.0000)	0.026 (0.0103)	0.019 (0.0285)	0.048 (0.0000)
1976-1998	0.058 (0.0000)	0.030 (0.0216)	0.060 (0.0000)	-0.044 (0.0014)	0.024 (0.0938)	0.039 (0.0000)

Notes. Annual data with 2 lags, autoregressive lags selected on the base of Akaike and Schwarz criteria; p-values in parentheses. Data and sources: see Appendix.

Table 3
Fiscal Reaction Function: instrumental variables

Dependent variable: growth rate of real primary spending	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) lagged output	(9) debt constrained	(10) elections
constant	0.058*** (0.000)	0.060*** (0.000)	0.063*** (0.000)	0.056*** (0.000)	0.047*** (0.000)	0.054*** (0.000)	0.016*** (0.000)	0.016*** (0.000)	0.021*** (0.000)	0.010*** (0.000)
ipi	0.388*** (0.006)	0.483*** (0.009)	0.464*** (0.001)	0.404*** (0.001)	0.470*** (0.000)	0.494*** (0.000)	0.323*** (0.000)	0.335*** (0.000)	0.356*** (0.000)	0.587*** (0.000)
ipi * democracy (1976)	-1.906*** (0.000)	-1.524*** (0.001)	-1.064*** (0.007)	-0.537 (0.300)	0.046 (0.903)					
ipi * stabilization plan (1960)		-0.094 (0.581)								
ipi * annual budget (1972)			-0.675*** (0.000)			-0.470*** (0.000)	-0.604*** (0.000)	-0.469*** (0.000)	-0.651*** (0.000)	-0.851*** (0.000)
ipi * EEC accession (1986)				-0.506 (0.390)						
ipi * peseta in EMS (1989)					-1.507*** (0.004)	-1.485*** (0.003)	-1.214*** (0.000)	-1.394*** (0.000)	-0.426** (0.020)	-0.904*** (0.000)
lagged debt/GDP									-0.023*** (0.001)	
election 1977										0.008** (0.032)
election 1979										0.034*** (0.000)
election 1982										0.005** (0.018)
election 1986										0.010*** (0.000)
election 1989										0.034*** (0.000)
AR	2	2	2	2	2	2	7	7	7	7
R-squared	0.064	0.126	0.153	0.197	0.241	0.285	0.687	0.669	0.701	0.721
J-stat	0.139	0.176	0.156	0.151	0.155	0.142	0.116	0.117	0.131	0.160
overid p-value	0.038	0.016	0.026	0.029	0.026	0.035	0.001	0.001	0.001	0.000
sample	1952-98	1952-98	1952-98	1952-98	1952-98	1952-98	1964Q1-1998Q4	1964Q1-1998Q4	1964Q1-1998Q4	1964Q1-1998Q4
observations	47	47	47	47	47	47	140	140	140	140
frequency	annual	annual	annual	annual	annual	annual	quarterly	quarterly	quarterly	quarterly

Note. Autoregressive lags selected on the base of Akaike and Schwarz criteria; p-values among parenthesis. GMM estimated with Bartlett kernel, fixed Newey-West bandwidth, and prewhitening. Instruments are the contemporaneous and lagged growth rate of a weighted industrial production index of 5 European core economies, plus lagged dependent variable and regressors. Data and sources: see Appendix.

Table 4
The effect of fiscal shocks on growth volatility

	GARCH model			C-GARCH model			
	spending shocks	tax shocks		spending shocks	spending shocks	tax shocks	tax shocks
mean equation			mean equation				
c	0.144*** (0.000)	0.133*** (0.000)	c	0.114*** (0.000)	0.121*** (0.000)	0.115*** (0.000)	0.122*** (0.000)
dum75	-0.113*** (0.000)	-0.111*** (0.000)	dum75	-0.090*** (0.000)	-0.092*** (0.000)	-0.095*** (0.000)	-0.099*** (0.000)
$\Delta y(-1)$	-0.061 (0.66)	-0.077 (0.47)	$\Delta y(-1)$	0.072 (0.288)	0.006 (0.948)	-0.048 (0.351)	-0.055 (0.571)
$\Delta y(-2)$	-0.462*** (0.000)	-0.403*** (0.000)	$\Delta y(-2)$	-0.240*** (0.000)	-0.287*** (0.000)	-0.277*** (0.000)	-0.260*** (0.003)
variance equation			transitory variance				
α	0.029 (0.84)	0.064 (0.47)	α	0.301*** (0.000)	0.317* (0.071)	0.599*** (0.008)	0.357* (0.078)
β	0.463*** (0.000)	0.048 (0.53)	β	-0.993*** (0.000)	-0.705** (0.044)	-0.455*** (0.000)	-0.048 (0.826)
ϕ	0.236*** (0.000)	0.321*** (0.000)	ϕ	-0.004 (0.904)	-0.004 (0.904)	-0.004 (0.904)	0.075*** (0.007)
			permanent variance				
			ω	0.000 (0.768)	0.000*** (0.000)	-0.0001*** (0.000)	0.0005*** (0.004)
			χ	0.827*** (0.000)	0.824*** (0.000)	0.679*** (0.000)	0.815*** (0.000)
			ψ	0.312 (0.450)	-0.038 (0.633)	-0.574*** (0.001)	-0.393*** (0.010)
			ϕ	0.033** (0.050)		0.108*** (0.000)	
R ²	0.485	0.490	R ²	0.511	0.515	0.505	0.526
Adj R ²	0.393	0.399	Adj R ²	0.392	0.397	0.384	0.411