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SPAIN

Selected Issues

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OVERVIEW

The selected issues paper presented here focuses on the issue of the conduct of fiscal policy in Spain, made topical by the entry into effect of the Budgetary Stability Law (BSL) in 2003. This Law (establishing that all public entities must formulate and execute their budgets in balance or surplus), along with the new permanent financing arrangements with the sub-national levels of government, provides a new institutional and legal framework for fiscal policy. These innovations aim to lock in the gains in fiscal consolidation represented by the achievement of the goals of the Stability and Growth Pact (SGP) already in 2001. But, as the vicissitudes of the Pact itself illustrate, the pursuit of a fixed nominal fiscal target that is not contingent on growth outcomes is not a robust fiscal framework over time—hence the recent shift toward assessing fiscal policy conduct under the SGP in cyclically adjusted terms.

The extent to which the suppression of the automatic fiscal stabilizers (implicit in the pursuit of a fixed nominal fiscal target) is problematic is however an empirical issue—depending on whether the stabilizers are just a "very old, very Keynesian idea" (Blanchard, 2000, p. 69) or whether they indeed serve to dampen output fluctuations. The present paper attempts to answer this empirical question, i.e., to assess whether and to what extent stabilizers actually stabilize and fiscal policy consequently affects aggregate demand in the case of Spain. The empirical evidence presented in the paper suggests that the impact of fiscal policy in Spain is consistent with the Keynesian view and that, in particular, allowing full play of the automatic stabilizers on the revenue side provides an appreciable macroeconomic stabilizing effect. As a corollary, pursuing a "balanced budget" rule irrespective of cyclical conditions would increase Spain's already comparatively high output volatility. These findings provide support to the position, put forth in the Staff Report, in favor of a cyclically sensitive conduct of fiscal policy under the BSL, i.e., one that would use the flexibility available under the Law (namely, the possibility of departing from budget balance in "exceptional circumstances," subject to the presentation of a viable three-year adjustment plan) to take appropriate account of cyclical developments.

FISCAL POLICY AND MACROECONOMIC VOLATILITY IN SPAIN: AN EMPIRICAL ASSESSMENT

A. Introduction

1. In the past decade, Spain has implemented a decisive shift in the conduct of fiscal policy. The large deficits of the early 1990s have given way to sustained gains in fiscal consolidation (text table). Aided by strong growth and lower interest rates in the latter part of the decade, public spending has been reduced by 4.5 percent of GDP since 1995 with only small declines in public capital expenditure;[1] the primary balance also improved 4.5 percentage points of GDP. Moreover, despite subdued growth in the past two years, Spain achieved the requirements of the Stability and Growth Pact (SGP) in 2001, and a small fiscal deficit (of some 0.2 percent of GDP) is estimated in 2002.[2]

Selected Fiscal Indicators 1993-2001

(In percent of GDP)

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Current revenues	41.6	40.9	37.0	37.4	37.6	37.7	38.3	38.5	38.6
Indirect taxes	9.5	10.2	10.2	10.2	10.5	11.1	11.7	11.7	11.4
Direct taxes	11.8	11.5	10.1	10.3	10.5	10.2	10.2	10.5	10.5
Direct taxes on households	8.5	9.3	8.9	9.0	8.2	7.6	7.1	7.3	7.2
Direct taxes on business	3.4	2.1	2.3	2.6	3.1	2.9	3.2	3.3	3.3
Social security contributions	14.8	14.6	13.0	13.2	13.1	13.0	13.1	13.3	13.6
Current expenditures	43.3	42.4	38.8	38.6	37.2	36.5	35.4	35.2	34.7
Public consumption	17.4	17.0	18.1	17.9	17.5	17.5	17.4	17.6	17.5
Current transfers	16.8	16.5	13.9	13.8	13.3	12.8	12.4	12.3	12.3
Interest payments	5.2	4.9	5.2	5.3	4.8	4.3	3.5	3.3	3.1
Gross fixed capital formation	4.0	3.9	3.8	3.2	3.2	3.3	3.5	3.2	3.4
Primary balance	-1.8	-1.5	-1.8	0.0	1.2	1.3	2.2	2.5	2.7
Overall balance	-7.0	-6.4	-6.6	-4.9	-3.2	-2.7	-1.1	-0.6	-0.1
Government debt	60.1	63.3	63.9	68.2	66.6	64.6	63.1	60.4	57.2

Sources: Bank of Spain; and Intervencion General de la Administracion del Estado.

2. Under the aegis of the Budgetary Stability Law (BSL), fiscal policy is poised to remain under tight control in 2003, and beyond. At the heart of the BSL is a multiyear commitment by all levels of government that—barring exceptional circumstances—budgets would be formulated, approved, and executed in balance or surplus. The BSL appears to have widespread public support, which has identified it with a straight forwardly clear "zero deficit" (*déficit cero*) requirement.[3] In part, this reflects the appealing notion of living within

[1] The general government definition does not capture the increasing role in public sector investment of public enterprises and entities.

[2] For a description of the Spanish fiscal consolidation process, see Molero and Pujol (2002).

[3] Public sentiment surveys in late 2002 place support of a "zero deficit" target at 70 percent.

one's means, but it has also been ingrained in the public's mind by a series of recent budgets that have consistently targeted—and largely achieved—a balance. Although the BSL incorporates elements of flexibility that could avoid inducing procyclical policy actions implied by a zero deficit,[4] the risk remains that a fixed nominal target be enshrined as the overriding objective of fiscal policy, regardless of cyclical conditions.

3. Constraining the cyclical smoothing role of automatic stabilizers could be particularly problematic for Spain, that historically has seen been subjected to high macroeconomic volatility. Output gap estimates consistently place Spain among the countries with highest average deviation from potential output during the 1990s. Among the larger EU countries, the average output gap for the Spanish economy is twice that of Italy, and exceeds by more than 50 percent that of France (Figure 1). The higher volatility is also displayed in the standard deviations of output, private consumption, and investment growth during the past forty years (Figure 2).[5]

4. The extent to which curtailing automatic stabilizers amplifies cyclical fluctuations, however, remains to be settled in the economic literature. Under Ricardian equivalence—the proposition that tax cuts or increases do not matter because, for a given spending path, taxes will have to be paid sooner or later—constraining the operation of stabilizers is immaterial. But the proposition does not hold when tax payers' planning horizon is not infinite, or the adjustment in taxes is seen in the distant future, or some agents are credit constrained, and so on. In these cases the pursuit of a nominal budget target regardless of cyclical developments will have adverse effects on macroeconomic volatility. In other words, whether automatic stabilizers are just a "very old, very Keynesian idea" (see Blanchard, 2000, p. 69), or a mechanism by which output fluctuations are dampened—i.e., whether stabilizers stabilize output and fiscal policy thus affects aggregate demand—is an eminently empirical question.

5. The remainder of the paper examines:

- The main features that may contribute to Spain's comparatively high output volatility, including the size of government, the economy's exposure to international trade, institutional features discussed in the economic literature, and other structural factors;

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[4] A budget deficit could be accommodated under the BSL "exceptional circumstances" and as long as it is accompanied by a viable adjustment program to restore balance over the medium term. Also, an expenditure contingency fund of 2 percent of central government expenditures builds a margin in the budget for unforeseen expenditures.

[5] In recent years, output volatility had fallen significantly—placing it closer to the EU average—but it remains above that of other major European countries.

- The effects that shocks in public revenues and expenditures have on the main macroeconomic aggregates—output, private consumption and investment. This includes estimating revenue and expenditure elasticities and characterizing the dynamic effects of fiscal policy;

- The relative importance of the role of revenues and expenditures in the operation of automatic stabilizers;

- The effect on cyclical fluctuations of pursuing a fixed balanced budget rule.

Most of the empirical evidence discussed below stems from small reduced-form models following the work of Blanchard and Perotti (2002, henceforth BP), and Perotti (2002).

B. Size of Government, Institutions, and Output Volatility

6. Before turning to the characterization of fiscal policy and its effect on the Spanish economy, this section places that discussion in a broader context by examining some of the recent academic literature that explores the fundamental factors underpinning fiscal policy. This has included an analysis of the size of the public sector and its impact on the economy, and how institutions interact with the public sector in determining its role in the economy.

7. One of the earlier strands of this literature analyzes the relationship between macroeconomic volatility, the size of government, and openness to trade:

- Galí (1994) is a precursor to this discussion, and argued that the stabilizing effect of fiscal policy is not limited to smoothing disposable income of credit-constrained consumers. The *size* of the government itself acts as a stabilizer. This is because the government is the "safe" sector of the economy and the larger it is, the more stable the economy becomes.[6] In advanced economies there appears to be some evidence (Figure 3, upper panel) that the average (absolute value of the) output gap is inversely related to the size of the government (measured by the share of public expenditures in GDP). In this context, Spain does not appear to be an obvious outlier, but its relatively smaller government—compared with France and Italy—would be consistent with greater output volatility.

- Rodrik (1998) built on this discussion and proposed that the size of government (the safe sector) is endogenous, and varies directly with the economy's exposure to international trade. Indeed, he argued that the more open an economy (and thus the

[6] This discussion abstracts from financing considerations that could imply that beyond a certain point, further increases in the size of government are likely to increase volatility, i.e., the relationship between government size and stability could become perverse.

more exposed to trade shocks) the larger its government should be to dampen the higher volatility. In this sense, the fundamental factor determining the size of government is the economy's openness to trade. In advanced economies there appears to be a direct relation between the size of government and openness (Figure 3, middle panel); Belgium, Ireland, and Netherlands seem to be outliers in this relationship. Note that Spain has a similar degree of openness as Italy and France, but its government is smaller. Examining the relation between openness and output volatility appears to confirm the hypothesis that higher volatility is associated with a greater degree of openness (Figure 3, lower panel).

8. Other authors have introduced political economy aspects to the analysis of the stabilizing effect of the public sector. Indeed this strand of the literature suggests that, accounting for these aspects, fiscal policy has a natural tendency to become procyclical:

- Tornell and Lane (1999) examined the case where multiple power blocs compete for a share in fiscal revenues. During upturns, the relaxation of budget constraints reduces the incentives to act prudently, leading to increased competition for fiscal resources. This generates a "voracity effect" and a procyclical pattern in fiscal policy. They argue that countries with more disperse political systems could be expected to exhibit higher fiscal policy procyclicality and greater macroeconomic volatility. Nonetheless, in advanced economies a direct relationship between the dispersion of political power—constructed by Henisz (2000)—and volatility does not emerge (Figure 4, upper panel). This might, however, reflect the inherent difficulties in measuring the dispersion of power. For Spain, the power dispersion index—reflecting the number of independent branches of government with veto power—suggests it has a similar dispersion as Italy but is subject to higher volatility.

- Perotti and Kontopoulus (forthcoming) considered a related idea of government fragmentation. In this context, the formulation and implementation of fiscal policy involves several actors and is decentralized. Agents do not internalize the costs of the policies they propose, and agreeing to the "right" policy response is difficult. Thus, in an upturn it is more likely to observe loose fiscal policies because agents know that budget constraints are less binding. In advanced economies, however, the relationship between the fragmentation of a government (as measured by the number of political parties in the governing coalition) and output volatility appears to be the opposite of what the model would suggest (Figure 4, lower panel): the higher the fragmentation the lower the volatility.

9. Going beyond these nontraditional issues affecting fiscal policy, other structural features of the economy are also likely to play an important role in determining macroeconomic volatility, namely :

- Flexible labor markets can help cushion the impact of adverse economic shocks. The timely reallocation of labor across sectors can help mitigate the adverse impact on the economy of shocks to specific sectors. Likewise, geographical mobility of labor is

important when facing shocks to specific geographical areas, and real wage flexibility can help in dealing with economy-wide shocks. Using the OECD's employment protection index (see OECD, 1999) as a proxy for labor market flexibility, in advanced economies its relation with output volatility is essentially nil (Figure 5, upper panel).[7] Moreover, on this score Spain's labor market does not appear to be significantly more rigid or flexible than that of other major euro area economies.

- Competitive product markets can also help buffer economic shocks. By establishing a level playing field—with rules and regulations that do not discourage the entry of new players—the economy is more likely to respond flexibly to adverse shocks. In the face of adversity, an economy would be more likely to come up with innovative solutions associated with the adoption of new techniques; vibrant markets could enable local agents to innovate and/or adjust technology to the needs of the domestic economy. Using the OECD's product market regulations index as a proxy (see Nicoletti, et al, 1999), in advanced economies a perverse negative relation appears between greater market regulation and output volatility (Figure 5, lower panel).

10. Although these theories have introduced additional elements to the discussion of fiscal policy, the evidence pointing to a specific reason or a set of factors underlying the higher variation of output in Spain is not immediately discernible. Despite the fact that openness data suggests that Spain's government may be smaller than expected, the relation between government size and volatility is not statistically significant; neither is any of the other relationships discussed in this section (see regressions 1.1 through 1.6, Table 1). Potentially, this could reflect the difficulties in providing adequate empirical counterparts to the economic ideas, and the possibility that the complexity of the economic reality is not immediately apparent in bivariate relationships. When all factors are jointly examined, however, openness appears to be statistically significant (regression 1.7). This is a bit surprising as none of the control variables is individually significant, and points to a potential problem of multicollinearity. Addressing these issues more fully is left for future research.

C. Fiscal Policy and its Macroeconomic Effects

11. The empirical evidence in the remainder of the paper seeks to characterize fiscal policy in Spain in a more traditional sense, reflecting both the macroeconomic effect of fiscal shocks (exogenous shocks) as well as its endogenous response to cyclical conditions using the structural VAR model proposed by BP and Perotti (2002). VAR models have the advantage of not assuming a positive effect from fiscal expansions—as in many large-scale macroeconomic models with a Keynesian structure—while avoiding the complexities of a full-blown general equilibrium model. However, VAR models—as well as other empirical models to a varying degree—are at a disadvantage when dealing with simulations that go

[7] Nevertheless, a clear picture of the effect that labor market flexibility has on reducing volatility emerges when examining consumption growth. In this context, Spain does not appear to be an outlier.

beyond the historical experience contained in the specific data sample, i.e., they are subject to the Lucas critique. (Readers not interested in the technical details of the empirical model can turn to the Empirical Evidence section—paragraph 20 onwards—below.)

VAR model preliminaries

12. The structural VAR model used to examine the dynamic macroeconomic behavior associated with fiscal policy shocks can be expressed as follows:

$$\begin{aligned} Y_t &= A(L)\varepsilon_t \\ &= A_0\varepsilon_t + A_1\varepsilon_{t-1} + A_2\varepsilon_{t-2} + \cdots \end{aligned}$$

where:

$$\begin{aligned} Y_t &= \left[\ln T_t, \quad \ln G_t, \quad \ln X_t\right] \\ \varepsilon_t &= \left[\varepsilon_t^T, \quad \varepsilon_t^G, \quad \varepsilon_t^X\right] \end{aligned}$$

and *T, G,* and *X* correspond respectively to public sector revenues and expenditures (in real terms), and a real macroeconomic variable of interest. [8] To examine the main macroeconomic aggregates, *X* is set equal to output (*GDP*), private consumption (*C*) and investment (*I*); these comprise the three models discussed below. *A(L)* represents a lag polynomial (3×3) matrix that captures the *structural* dynamic responses of Y_t stemming from the structural shocks that characterize the impact of fiscal policy. ε_t is the vector of structural shocks in revenues, expenditures and *X*. These shocks are assumed to be serially uncorrelated, with $E[\varepsilon_t] = 0$, and $E[\varepsilon_t \bullet \varepsilon_t^{'}] = D$, where *D* is a diagonal matrix with the variances of the shocks. By nature, structural shocks are not directly observable, and are assumed not to have a common cause.

13. To implement this model empirically, it is expressed in reduced form as:

$$\begin{aligned} Y_t &= C(L)\mu_t \\ &= C_0\mu_t + C_1\mu_{t-1} + C_2\mu_{t-2} + \cdots \end{aligned}$$

where *C(L)* represents a lag polynomial (3×3) matrix that contains the *reduced-form* dynamic effects stemming from the shocks; these are intermediate results used in the characterization of fiscal policy, and are not of direct interest here. μ_t is a vector of the reduced-form (VAR) shocks with $E[\mu_t] = 0$, and $E[\mu_t \bullet \mu_t^{'}] = \Omega$, where Ω is the variance/covariance matrix of the reduced-form shocks. (Note that contrary to other VAR modeling techniques, the model is not normalized, i.e., C_0 is not an identity matrix.) The coefficients of the (finite) VAR

[8] For details of the variables used see Table 3 in Appendix I. Note that government revenues and expenditures are both deflated by the GDP deflator.

representation of this model, $C(L)^{-1}$, are estimated using standard techniques. The "residuals" of these estimated equations are the μ_t discussed below.

Blanchard-Perotti identification steps

14. The identification process consists in recovering the structural model parameters from their estimated reduced-form counterpart. Interestingly, identifying the matrices A_0 and C_0 allows the identification of the entire structural model given the estimates of the reduced-form model (see Hamilton, 1994). In structural VAR modeling, these matrices are identified by combining structural information (or assumptions) about the effect of specific shocks (such as whether a downturn of the economy in a specific quarter leads to a concurrent adjustment in fiscal spending), and the econometric properties of shocks.

15. The identification process begins by comparing the reduced-form and structural models, that is: $C(L)\,\mu_t = A(L)\,\varepsilon_t$. For the contemporaneous case (L=0) this translates into $C_0 \cdot \mu_t = A_0 \cdot \varepsilon_t$, or more explicitly:[9]

$$\begin{bmatrix} c_{0,11} & c_{0,12} & c_{0,13} \\ c_{0,21} & c_{0,22} & c_{0,23} \\ c_{0,31} & c_{0,32} & c_{0,33} \end{bmatrix} \begin{bmatrix} \mu^T \\ \mu^G \\ \mu^X \end{bmatrix} = \begin{bmatrix} a_{0,11} & a_{0,12} & a_{0,13} \\ a_{0,21} & a_{0,22} & a_{0,23} \\ a_{0,31} & a_{0,32} & a_{0,33} \end{bmatrix} \begin{bmatrix} \varepsilon^T \\ \varepsilon^G \\ \varepsilon^X \end{bmatrix}$$

and imposing the BP model (and notation) renders the following expression:

$$\begin{bmatrix} 1 & 0 & -a_1 \\ 0 & 1 & -b_1 \\ -c_1 & -c_2 & 1 \end{bmatrix} \begin{bmatrix} \mu^T \\ \mu^G \\ \mu^X \end{bmatrix} = \begin{bmatrix} 1 & a_2 & 0 \\ b_2 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \varepsilon^T \\ \varepsilon^G \\ \varepsilon^X \end{bmatrix}$$

16. The intuition behind the model is clarified when the multiplication is carried out; the resulting set of equations is:

$$\mu^T = a_1\mu^X + a_2\varepsilon^G + \varepsilon^T$$
$$\mu^G = b_1\mu^X + b_2\varepsilon^T + \varepsilon^G$$
$$\mu^X = c_1\mu^T + c_2\mu^G + \varepsilon^X$$

In turn, these equations state that:

- First, the unexpected movements in taxes (μ^T) reflect unexpected movements in the macroeconomic variable (μ^X), and structural (or discretional) government expenditure and revenue shocks (respectively, ε^G and ε^T);

[9] To simplify the notation, time subscripts are dropped subsequently.

- Second, the unexpected movements in expenditures (μ^G) reflect unexpected movements in the macroeconomic variable, and structural (or discretional) revenue and expenditure shocks; and

- Third, the unexpected movements in the macroeconomic variable reflect unexpected movements in revenues, expenditures, and structural shocks in this variable (ε^X).

Note that these equations contain six unknown coefficients—a_i, b_i, and c_i, where i=1, 2—and exact identification requires an equal number of restrictions/estimates as discussed below.[10]

First step

17. The coefficients a_1 and b_1 capture respectively the automatic response of taxes and expenditures to changes in the macroeconomic variable (automatic stabilizers), and the discretional adjustment of fiscal policy to cyclical conditions. In the context of an analysis based on quarterly data, BP argue that discretional changes in taxes and expenditures to the business cycle are not likely to occur within the quarter because the recognition, decision, and implementation lags are likely to exceed three months. Thus, they suggest setting these coefficients equal to the values of revenues and expenditure elasticities (see Box 1, and Appendix II).

Second step

18. Estimating c_1 and c_2—reflecting the effect on the macroeconomic variable of changes in revenues and expenditures respectively—requires addressing the third equation's endogeneity. The problem arises from the fact that the unexpected movements of taxes and spending (the regressors) reflect the structural shocks in X (the "residual"). This is immediately apparent from the first two equations where a_1 and b_1 (the tax and spending elasticities) are not zero in general. As is common in the econometric literature, the simultaneity problem is solved using an instrumental variable approach. In this case, the endogenous response of the unexpected movements of tax and spending must be purged from the variables. The solution is to construct cyclically adjusted revenues and expenditures:

$$\tilde{\mu}^T = \mu^T - a_1\mu^X$$
$$\tilde{\mu}^G = \mu^G - b_1\mu^X$$

and using these "first stage estimates" as instruments to estimate c_1 and c_2 in a "second stage" regression defined by:

$$\mu^X = c_1\tilde{\mu}^T + c_2\tilde{\mu}^G + \varepsilon^X$$

[10] In rigor, the model also contains three unknown variances in D that are recovered from the estimation of the equations.

Box 1. Estimating Expenditure and Revenue Elasticities

Estimates for expenditure and revenue elasticities for a large group of advanced countries are reported below. These values were obtained using OLS where the variables in the regressions correspond to the cyclical component of the relevant variables. As in other studies, these estimates do not account for discretionary (or structural in the BP model sense) changes in fiscal policies, and are similar to estimates obtained using levels, and/or first differences of the variables.

Although the estimated elasticities for (total) revenues and expenditures are similar to those of the average advanced economy, there are a two important differences:

- The elasticity of direct taxes on corporates is about twice that of the average economy; and
- The elasticity of social security contributions is about 50 percent greater than the average economy.

The former is suggestive of the strong effect that tax shocks have on investment in Spain, but is not the full story because this elasticity is similar to that in the U.S. where tax shocks have a smaller effect.

TAX AND EXPENDITURE ELASTICITIES

	Direct Taxes		Indirect Taxes	Social Security Contributions	Total Current Revenues	Consumption Spending	Social Security Benefits	Total Current Spending	Total Spending
	Business	Households							
Australia	4.89	1.28	0.95	...	1.56	-0.18	-2.44	-0.58	-0.44
Austria	1.02	0.89	1.15	0.14	0.80	0.16	-0.28	-0.13	0.08
Belgium	0.22	-0.15	0.37	0.20	-0.04	0.01	-0.48	-0.18	-0.30
Canada	2.98	0.46	0.49	0.23	0.64	-0.34	...	-0.56	-0.53
Denmark	5.03	1.03	2.42	0.55	1.19	-0.07	-0.34	0.11	0.11
Finland	3.43	0.87	1.04	-0.54	0.49	0.12	-1.16	-0.58	-0.49
France	3.94	-0.28	0.16	0.10	0.32	-0.32	-0.50	-0.67	-0.59
Greece	-0.89	0.54	0.46	0.36	0.25	-0.11	0.00	-0.26	0.11
Iceland	1.57	1.61	1.56	-1.75	1.24	0.95	1.02	1.00	1.02
Ireland	0.50	-0.09	0.45	0.16	0.26	0.41	-0.48	-0.16	-0.08
Italy	-1.86	-0.17	1.25	0.53	0.60	0.55	-0.74	-0.36	-0.32
Japan	2.21	1.48	1.28	0.02	1.16	-0.06	-1.08	-0.31	0.25
Luxembourg	...	...	2.57	1.00	0.94	-0.16	-0.24	0.20	0.28
Netherlands	0.56	2.44	1.32	-0.49	0.49	0.46	0.18	0.24	-0.15
New Zealand	3.69	1.05	0.65	2.69	1.29	0.57	0.17	-0.21	0.47
Norway	-0.77	1.28	1.90	1.13	0.87	0.61	-0.53	0.38	0.46
Portugal	1.42	-0.06	0.58	-0.04	0.40	0.94	-0.39	-0.44	-0.16
Spain	**4.21**	**0.69**	**0.89**	**0.50**	**0.73**	**0.37**	**-0.21**	**0.07**	**0.01**
Sweden	3.04	1.86	1.58	0.30	1.23	0.20	-0.37	-0.55	-0.72
Switzerland	...	0.39	...	...	...	0.62	...	...	...
United Kingdom	7.25	0.30	0.66	0.77	1.22	-0.20	-1.82	-0.50	-0.77
United States	4.13	1.35	0.20	1.13	1.22	0.42	-1.47	-0.17	-0.03
Average	2.33	0.80	1.04	0.35	0.80	0.23	-0.56	-0.17	-0.09

Note. The elasticities are obtained from OLS estimates of the following equation: $FV=\alpha+\beta \times Y$, where FY and Y denote respectively the fiscal variable and GDP, both expressed as the (log approximation of the) percent difference from their respective trends (HP filtered series); β denotes the elasticity reported in the table.

These elasticities are similar to those obtained by others for Spain. For instance, van den Noord (2000) combines regression analysis with institutional information in order to compute automatic stabilizers. This approach entails obtaining elasticities of different tax bases (and unemployment) to the output gap that are combined with elasticities of tax collections and expenditures with respect to their bases that in turn come from the tax code; in some instances these are assumed to equal one. The resulting estimates are similar to those above except for the elasticity of direct taxes on corporates that is smaller. Lane (2002), and Boscá, Doménech and Taguas (1999) report elasticities for specific budget items for Spain that are quite similar to those reported here. However, available estimates consistently report a perverse negative elasticity for expenditures.

Third step

19. BP argue that estimating the last two coefficients, a_2 and b_2, requires a judgment call. They note that the former reflects the contemporaneous response of (the unexpected movements of) revenues to a discretionary (structural) change in expenditures; the latter reflects the opposite response. Potentially, the unexpected discretionary (structural) changes in revenues and expenditures are determined jointly, and this could obscure their individual effect and complicate the econometric process of unraveling their effects. BP suggest examining two alternative assumptions:

- Tax decisions are made before expenditure decisions, and thus taxes do not respond to spending decisions contemporaneously. This would imply that $a_2 = 0$ and thus b_2 could be estimated.

- Expenditure decisions are made prior to tax decisions, so that expenditures do not respond to tax decisions contemporaneously. This would imply that $b_2 = 0$, and a_2 would be estimated.

The empirical results discussed below are for the first case as this would seem to conform better with Spain's recent budgetary practice whereby revenue estimates are determined first—given a specific macroeconomic environment—and then expenditures are set to be in line with these. In any event, the results discussed here are reasonably robust (qualitatively) to the alternative assumption, suggesting that (in the sample period) there is little, if any, contemporaneous correlation between these decisions.

Empirical evidence[11]

Structural model estimates[12]

20. The estimates of the impact of changes in taxes and expenditures on the economy (c_1 and c_2) are telling (Table 2). Increases in taxes have powerful adverse effects on output, with

[11] This section discusses the empirical evidence from a VAR model with four lags estimated with OLS, over 144 quarterly observations from 1964 to 2000; estimates are conditional on the first four observations are used to condition the estimates. The results when the VAR model is estimated with eight lags are qualitatively unchanged. Specifically, using the extended model the corresponding estimates of the BP model (Table 2), and the resulting impulse responses (Figures 6–10) yield the same conclusions as those reached here.

[12] Although the identification and estimation of the BP model was described as an equation by equation, this paper uses a system-wide estimation procedure (proposed by Bernanke, 1986) that is analogous to a full-information maximum likelihood estimation. Here these estimates are made conditional on the tax and expenditure elasticities, and on the assumption that tax decisions come first.

a more than proportional response of output (-1.28) and these effects are statistically significant. The impact on consumption is somewhat smaller (-0.78) but nonetheless significant. Perhaps most striking is the impact on investment, whereby a one percent increase in taxes leads to a more than twofold (-2.45) decline in investment. It is not immediately apparent why investment would respond so strongly to tax changes in Spain. Indeed the tax structure does not appear to differ significantly from that of other advanced economies (Box 2, and Appendix III), although the elasticity of direct taxes on corporates is relatively high (Box 1).

21. Conditional on tax and spending elasticities, estimates of b_2 are consistently positive in the structural model. This suggests that expenditures increase in tandem with discretionary increases in taxes, but the magnitude and statistical significance of the increase varies with the specific macroeconomic variable included in the model. In Model 1 ($X = GDP$), the elasticity of expenditure to structural tax increases is about 0.07 and is not significant at standard significance levels. In contrast, in Models 2 and 3 (respectively $X = C, I$), the estimated elasticity is more than three times greater and significant. These estimates, nonetheless, suggest that structural increases in taxes will lead to an improvement in the fiscal balance as only a small fraction, if any, translates into additional expenditures.[13]

Impulse Responses

22. Structural impulse responses are estimated from these coefficients. To simplify the comparison of the responses of the different macroeconomic variables, the impulse responses to a specific shock for each of the three models are presented side-by-side. Thus, the impulse responses for revenue, expenditure, and macroeconomic shocks are depicted respectively in Figures 6 through 8. Note that the impulse responses correspond to "positive" shocks, i.e., increases in revenues, expenditures, and the macroeconomic variable.

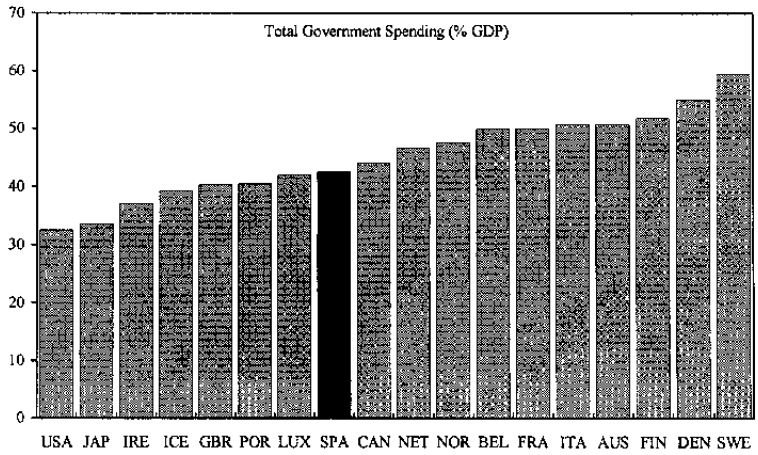
23. The structural impulse responses appear consistent with the Keynesian view of fiscal policy, suggesting that:

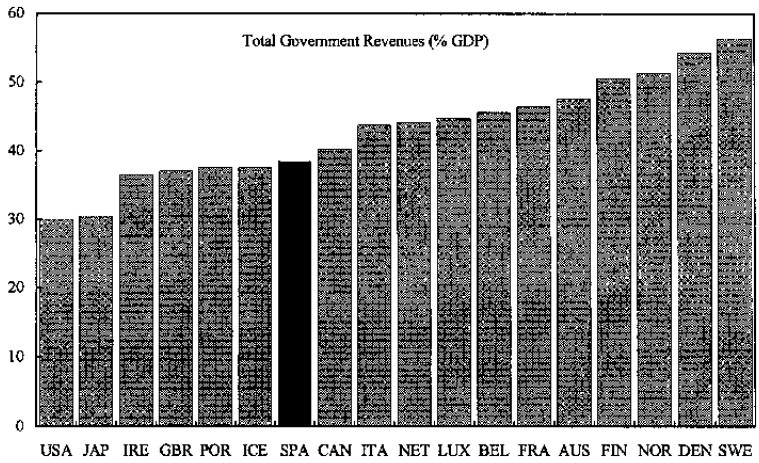
---

[13] As in other European countries (Perotti, 2002), there is some evidence of a structural break—as evidenced by Andrews (1993) stability test for an unknown breakpoint—during the sample period, particularly in the earlier part of the sample. Nonetheless, this instability does not appear to be economically meaningful: the conclusions to be drawn from models estimated by dropping the data from the 1960s and 1970s remain unchanged from those discussed in the paper. The main difference is the estimate of b_2 (the response of structural spending to changes in structural revenues) that doubles to about 0.5, and becomes significant. And, the resulting impulse responses suggest that public expenditures appear to have clearer tendency to be procyclical. This is a bit puzzling in face of the observed drop in output volatility, and further work is required to fully analyze the parameter instability.

Box 2. Size and Composition of Public Spending and Revenues

The size of the Spanish public sector—measured by the ratio of total government spending to GDP—is intermediate in the context of advanced economies. But the public sector is small compared with other major euro area countries such as Italy or France, where public spending is close to 50 percent of GDP and about 10 percentage points greater than in Spain. (A similar pattern emerges from the share of revenues in GDP.)





Regarding the composition of public spending and revenues (see Appendix III):

- The pattern of public spending in Spain does not appear to differ significantly from that of other major euro area economies. Specifically, the shares of consumption and social security benefits in total expenditures are similar to those observed in Italy and France. However, the share of public investment is higher than in Italy and France, and is closer to the shares in Portugal and Ireland.

- The configuration of tax revenues in Spain is also similar to those of other major euro area economies.

Specifically, the shares of indirect taxes and social security contributions in total revenues are in line with those in Italy and France. The main difference is the lower share of direct taxes on households in Spain.

- A structural shock to revenues is contractionary (Figure 6). The output contraction develops over the course of a year to six quarters, and begins to ease after a couple of years. The decline in investment is deeper and takes longer to develop; the decline in consumption is shallower and dissipates sooner.

- A structural shock to expenditures is expansionary (Figure 7). The expansionary effect on output lasts about a year, after which it appears to be indistinguishable from zero, i.e., the response plus/minus one standard error includes zero. The responses of investment and consumption are qualitatively similar to those of output, although the investment response is larger. The positive response of investment suggests that investment is not crowded out by greater public expenditures.

- A structural shock to the macroeconomic variable leads to a stabilizing increase in revenues, with only small declines in spending at the outset (Figure 8). The revenue responses follow closely the path of the macroeconomic variable, i.e., they are roughly proportional leaving the share of revenues in output constant.

Relative importance of revenue and expenditure stabilizers

24. The relative importance of revenue and expenditure stabilizers can be obtained by shutting down these channels in turn; recall the first two equations of the model, reproduced below:

$$\mu^T = a_1\mu^X + a_2\varepsilon^G + \varepsilon^T$$
$$\mu^G = b_1\mu^X + b_2\varepsilon^T + \varepsilon^G$$

By setting the revenue elasticity a_1=0, and comparing the new impulse responses with those discussed above provides a measure of the importance of the revenue channel in stabilizing output. Similarly, computing the impulse responses when b_1=0 provides a measure of the role of expenditures in stabilizing output.

25. The restricted impulse responses suggest that:

- Automatic stabilizers in Spain reflect primarily the operation of revenues. Following a macroeconomic shock (ε^X) the response of output, consumption, and investment are larger in the absence of the stabilizing effect of revenues (the broken versus the solid lines in the first row in Figure 9). The "de-stabilizing" effect is more pronounced on investment—that expands more than 4 percent above its baseline in the second year compared with an increase of just under 3.5 percent with full operation of automatic stabilizers—than on consumption. The smaller effect on consumption is suggestive of a consumption behavior that reflects more than just the contemporaneous level of (disposable) income. Note that reflecting the implicit increase in the economy's volatility, output shocks (ε^Y) increase by about 50 percent when revenue stabilizers are turned off.

- Automatic stabilizers in Spain do not appear to reflect the operation of expenditures. Turning off the stabilizing effect from expenditures results in impulse responses that are virtually indistinguishable from those with the full play of automatic stabilizers.

Balanced budget policy

26. Examining the effects of pursuing a nominal balanced budget policy is a more challenging endeavor, and a full discussion is beyond the scope of this paper. In principle, this requires restricting the (endogenous) impulse responses of revenues and expenditures so that these coincide following a macroeconomic shock. In other words, this would imply restricting the BP model and the estimated VAR coefficients, $C(L)^{-1}$. This paper examines the implications of a balanced budget policy in the simplified case where only the BP model is constrained, and so only unanticipated movements in taxes and expenditures are constrained to be equal.

27. Formally, this constraint is imposed by setting $\mu^T = \mu^G$ (assuming that tax decisions come first) implying that:

$$a_1\mu^X + \varepsilon^T = b_1\mu^X + b_2\varepsilon^T + \varepsilon^G$$

and leading to the following expression for b_2:

$$b_2 = (a_1 - b_1)\frac{\mu^x}{\varepsilon^T} - \frac{\varepsilon^G}{\varepsilon^T} + 1$$

Substituting in the BP model results in the following restricted model:

$$\begin{aligned}\mu^T &= a_1\mu^X + \varepsilon^T \\ \mu^G &= a_1\mu^X + \varepsilon^T \\ \mu^X &= c_1\mu^T + c_2\mu^G + \varepsilon^X\end{aligned}$$

Here, the first two equations state that unexpected movements in taxes and expenditures are identical, responding with the same intensity to unexpected macroeconomic developments, and to structural tax shocks. In effect, the balanced budget policy has blurred the distinction between structural tax and expenditure shocks as these are no longer independent: they are one and the same.

28. Note that the third equation is unchanged from the unrestricted BP model, and its coefficients have not been re-estimated. These are left unchanged to isolate the effect of imposing the policy restriction. In principle, these coefficients could change if the balanced budget rule is viewed by economic agents as a regime change, and thus the resulting impulse responses would be subject to the Lucas critique. This issue is not explored further but the coefficients are likely to remain unchanged when consumers are credit-constrained and the

financial sector is less developed, because agents are less able to adjust their consumption paths, or investment plans in response to the new regime.

29. The "balanced budget" impulse responses following an output shock suggest that output becomes more volatile when a balanced budget rule is imposed (see Figure 10). This is more pronounced in the first year following the shock. The responses suggest that the higher volatility stems primarily from the substantial procyclical increase in public expenditures. In this model, the higher revenues induced by the positive output shock create scope, under a nominal budget balance target, for such additional expenditure.

30. Note that the simplified assumptions used to obtain the impulse responses are likely to underestimate the true increase in output volatility, particularly following the first year. After the initial response of revenues and expenditures—constrained to be the same—the impulse responses of revenues and expenditures are similar during the first year or so after the shock. Afterwards, however, the path of spending appears to be lower than that of revenues, and thus a "stabilizing" surplus appears to emerge in the course of the second and third years. A full simulation of a balanced budget target would imply greater fiscal stimulus (either in the form of higher expenditures or lower revenues), and thus a larger output response than that captured in this exercise.

D. Summary and Policy Considerations

31. Spain has made great strides in fiscal consolidation, and stands alone among major euro area economies in having achieved the goals of the Growth and Stability Pact. The Budgetary Stability Law, in effect as from 2003, is intended to lock in these gains by ensuring fiscal discipline at all levels of government. The empirical findings of the paper suggest that, to this end, the conduct of fiscal policy under the BSL will need to avail itself of the elements of flexibility provided by the Law. This will be key in avoiding fiscal policies that, by suppressing the workings of the automatic fiscal stabilizers, would act to exacerbate Spain's already relatively high output volatility.

32. In many regards, the impact of fiscal policies in Spain is similar to that in other advanced countries. Although there is some variation in the extent to which the evidence suggests that fiscal policies are consistent with the Keynesian view, the bulk of the evidence suggests that increases in taxes (expenditures) are contractionary (expansionary). Understanding which factors are at play in non-standard effects of fiscal policy remains an area for further research.

33. In other regards, however, the impact of fiscal policies in Spain contrasts with the evidence for the United States and other advanced economies. For the United States, the estimates of the structural model presented in BP suggest that the impact of changes in revenues and expenditures are of roughly the same magnitude (in absolute value). Also, the dynamic responses of the economy suggest that private investment is crowded out by government spending shocks. For other advanced economies, the dynamic responses of the

economy suggest that in the pre-1980 period spending had an expansionary effect on output, but in the post-1980 period positive spending multipliers tended to be an exception.

34. Several considerations emerge from the analysis:

- Although Spain's output volatility has declined recently, it remains higher than that of other advanced countries, and also appears higher than that observed for other countries with the same degree of openness. A fuller understanding of the interaction of openness, power dispersion, fragmentation, and labor and product market rigidities on output volubility would require additional cross-country analysis that could afford a greater opportunity to discriminate between alternative hypotheses.

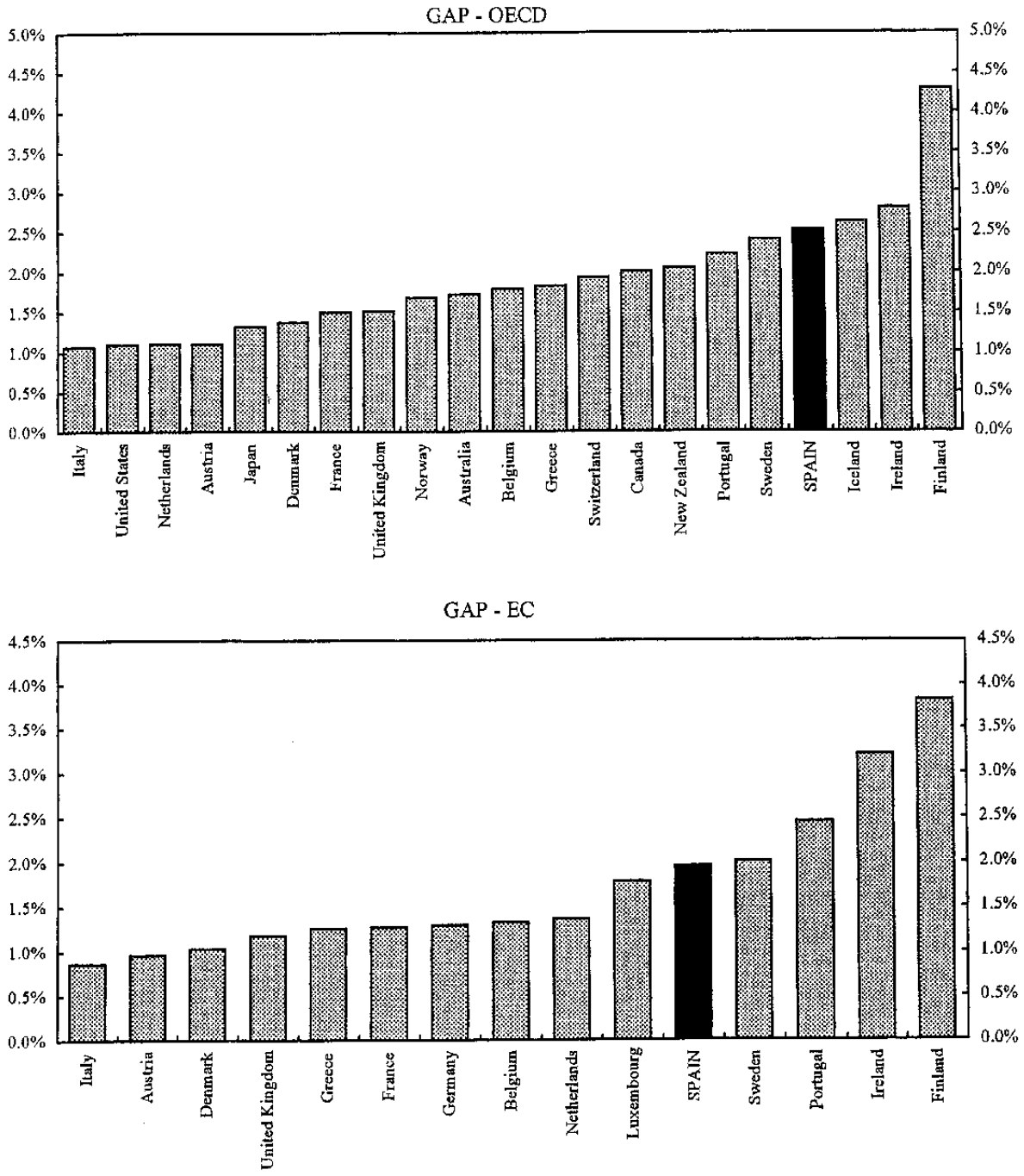
- Fiscal policy effects operate in a manner consistent with a Keynesian view whereby increases in revenues (expenditures) are contractionary (expansionary). Increases in revenues have longer-lasting effects on the economy than increases in expenditures.

- Tax increases have a comparatively larger adverse effect on investment. This result would merit further investigation as the revenue structure does not appear to be biased toward corporate taxation. This would be consistent, nonetheless, with Spanish corporations' scant reliance on outside sources of financing, with reductions in profits thus limiting their ability to undertake new investment projects.

- Automatic stabilizers operate mostly on the revenue side, with the expenditure channel exhibiting only a negligible stabilizing effect on output. Thus, a policy establishing fixed expenditure ceilings and allowing revenues to reflect cyclical conditions would result in a stabilizing effect broadly comparable to a policy that allows full play of automatic stabilizers on both the revenue and expenditure sides.

- Pursuing a fixed nominal balanced budget target increases the economy's volatility, primarily by inducing a procyclical behavior of expenditures.

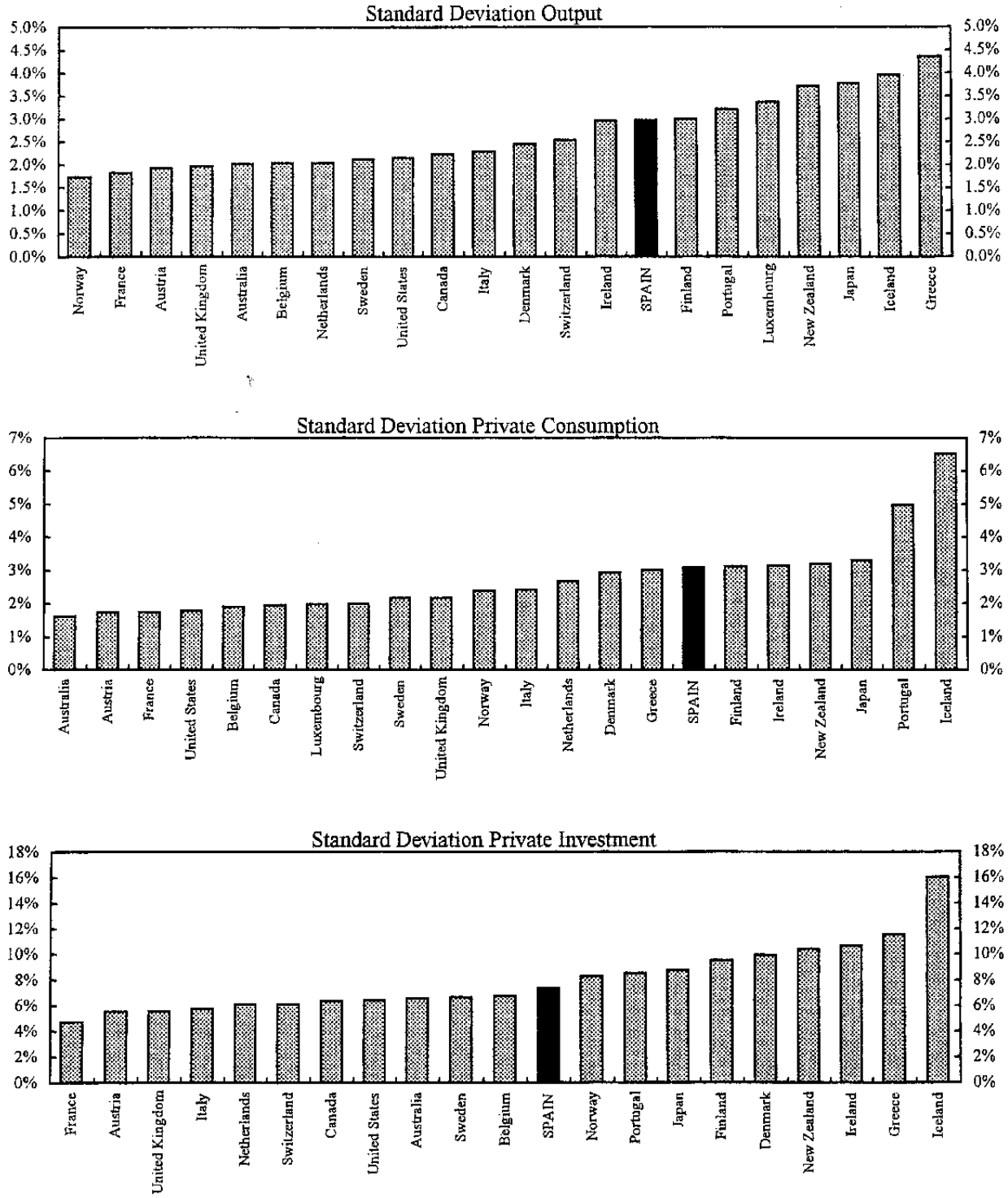
Figure 1. Spain: Average Output Gap during the 1990s 1/



Sources: OECD; and European Commission.

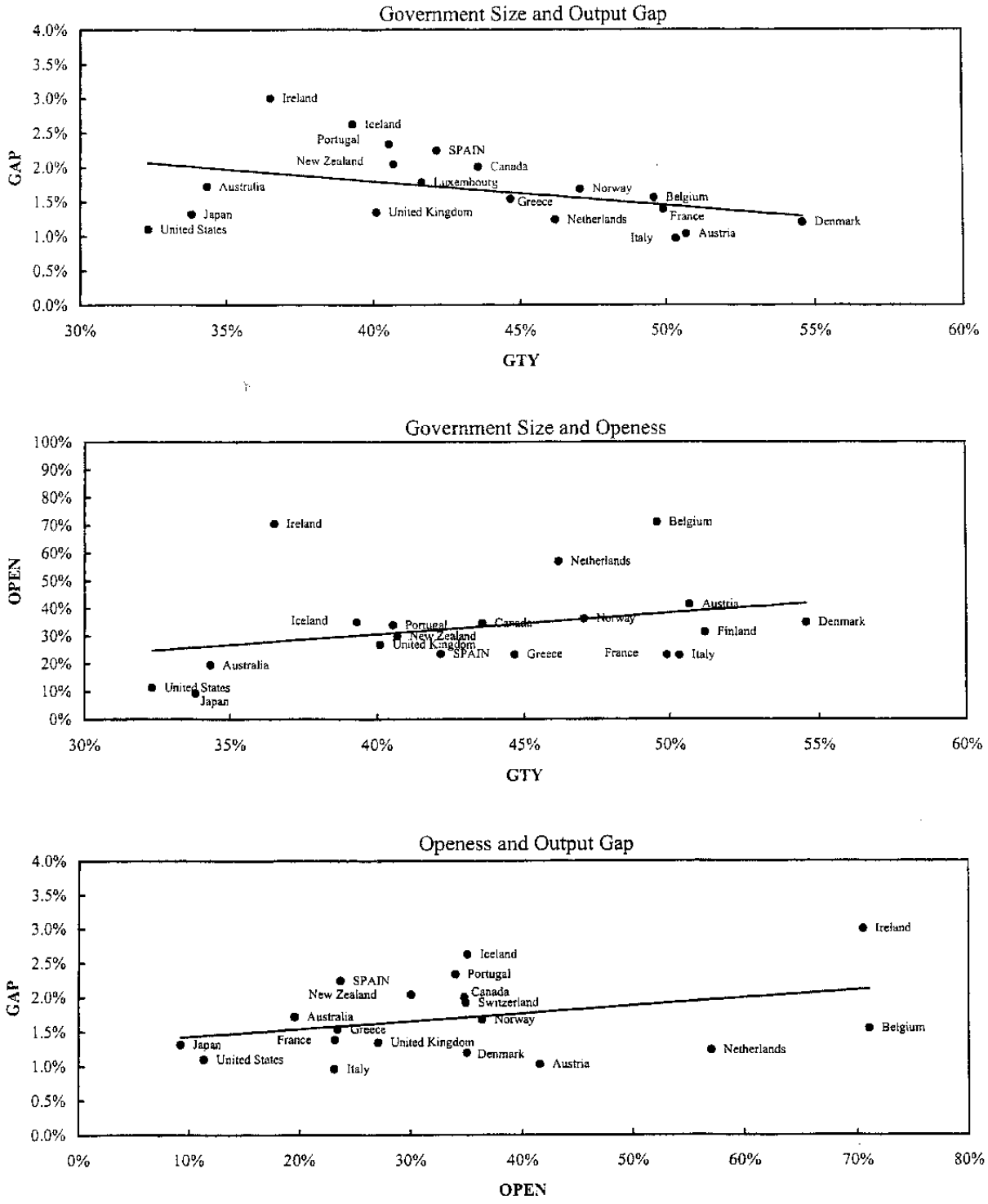
1/ This average output gap is computed as the average of the absolute value of the output gap in each year. The OECD estimates of potential output are obtained from a "production function approach," while those by the European Commission are obtained using a HP filter.

Figure 2. Spain: Macroeconomic Volatility, 1960-2001



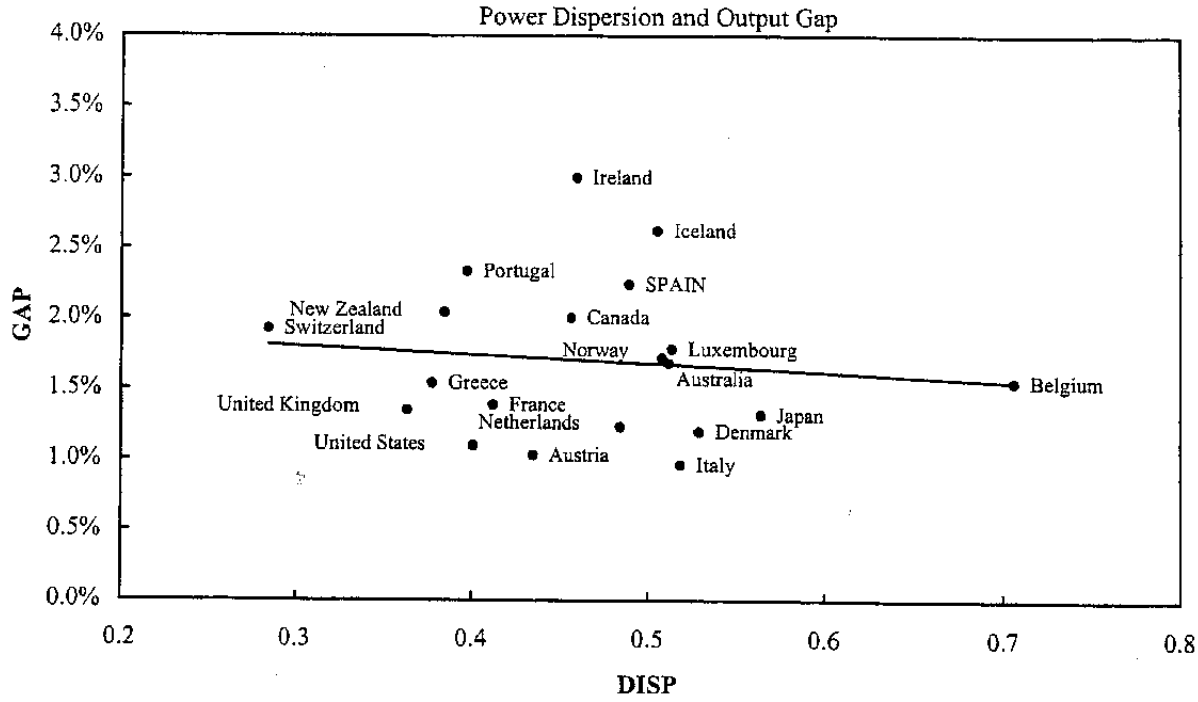
Sources: OECD; European Commission; and Fund staff estimates.

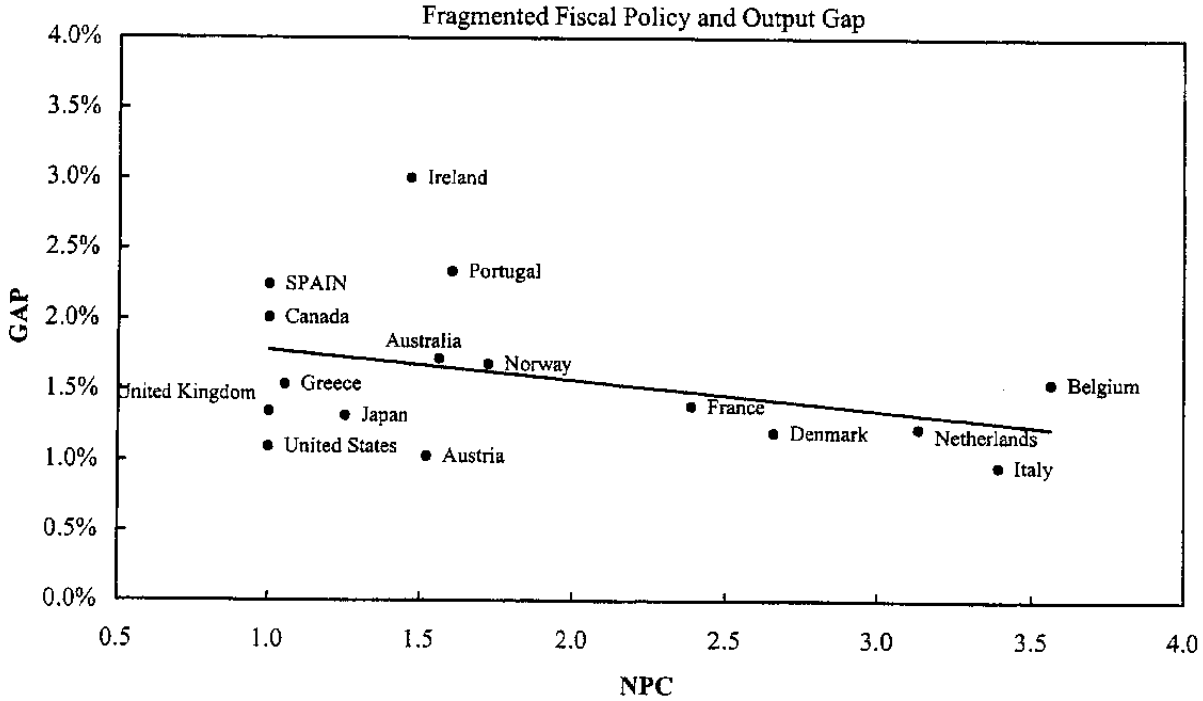
Figure 3. Spain: Government Size and Macroeconomic Volatility



Sources: OECD; European Commission; and Fund staff estimates.

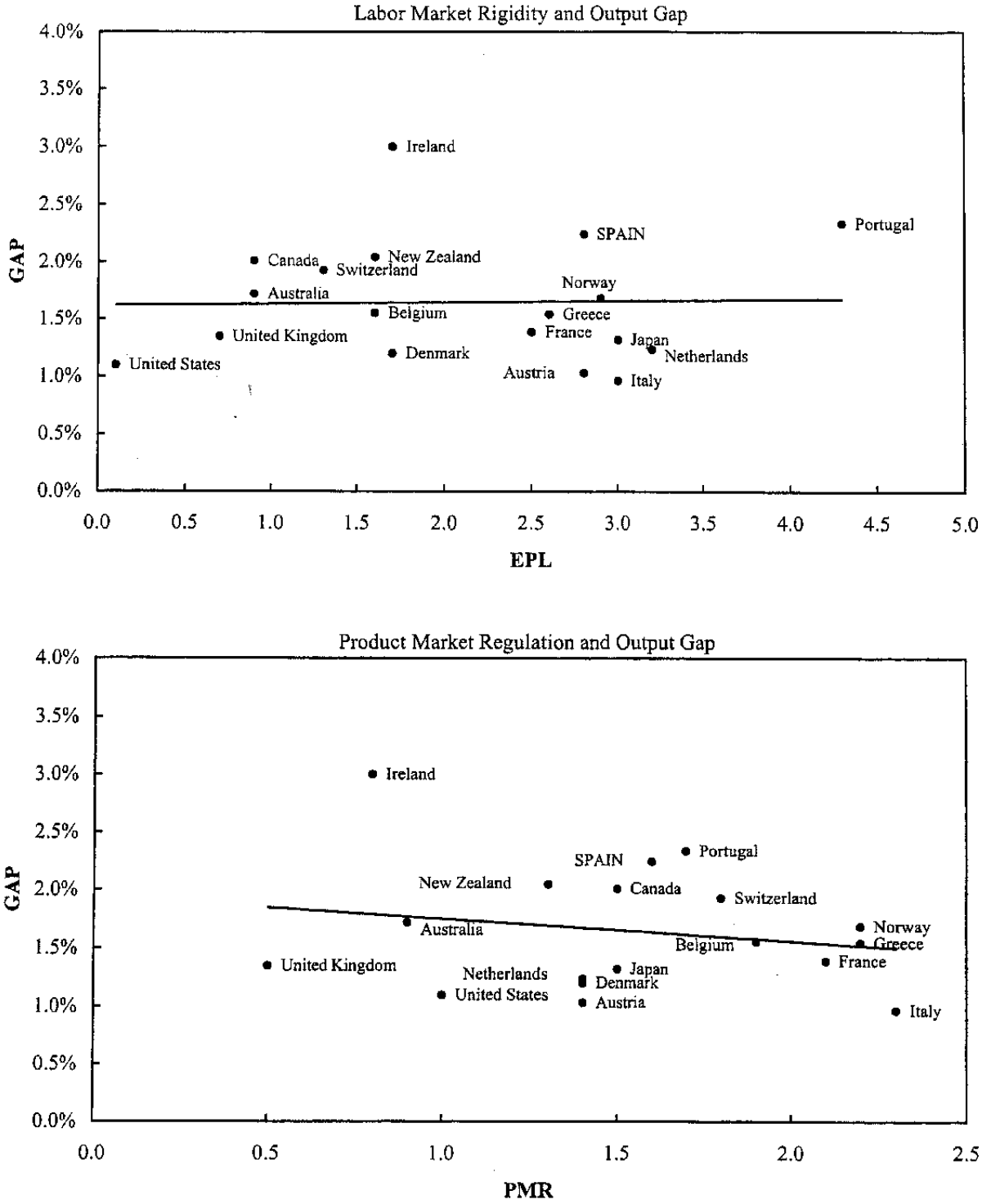
Figure 4. Spain: Political Economy and Macroeconomic Volatility





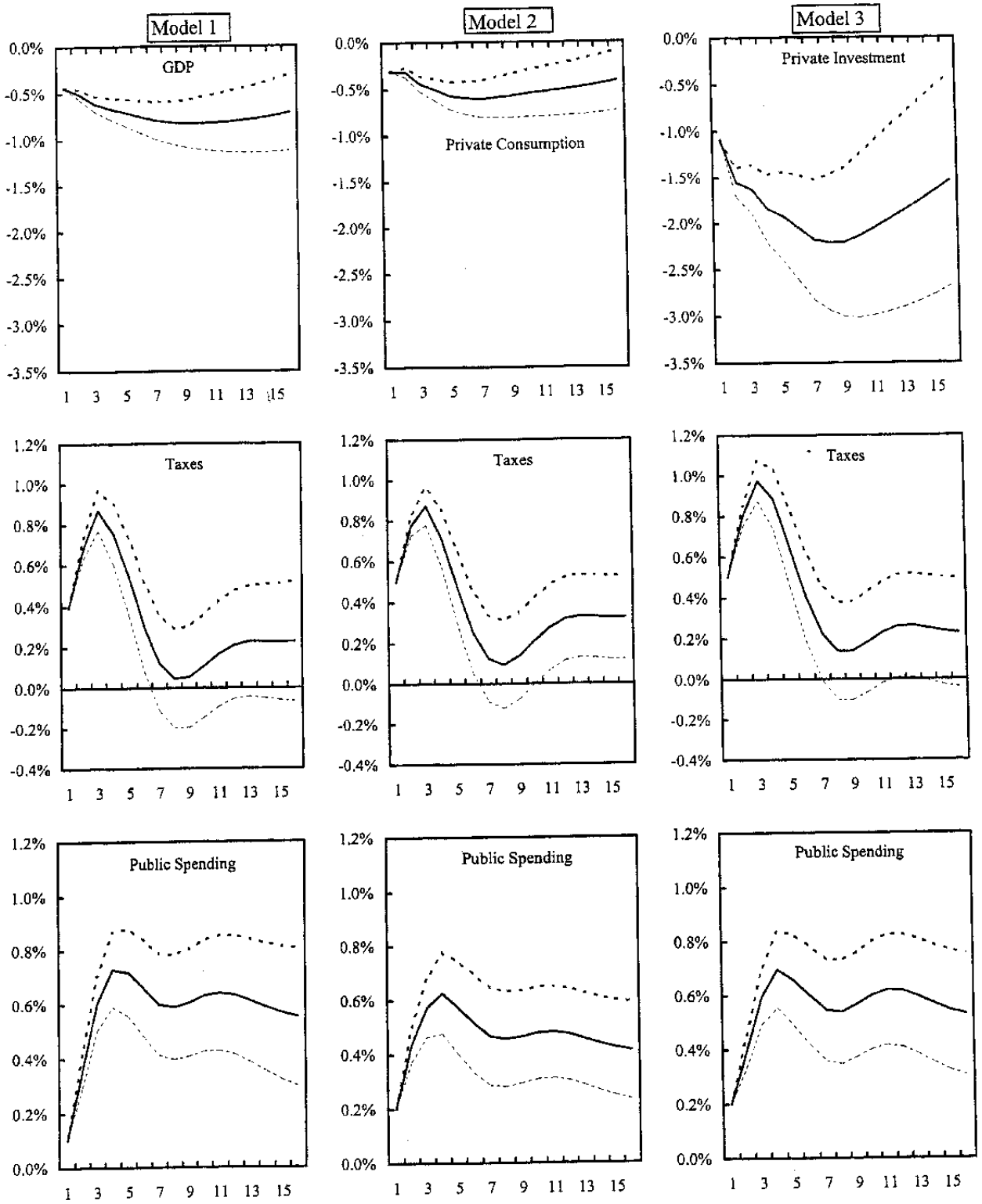
Sources: OECD; European Commission; Henisz (2000); Perotti and Kontopoulos (1998); and Fund staff estimates.

Figure 5. Spain: Markets Rigidity and Macroeconomic Volatility



Sources: OECD; European Commission; and Fund staff estimates.

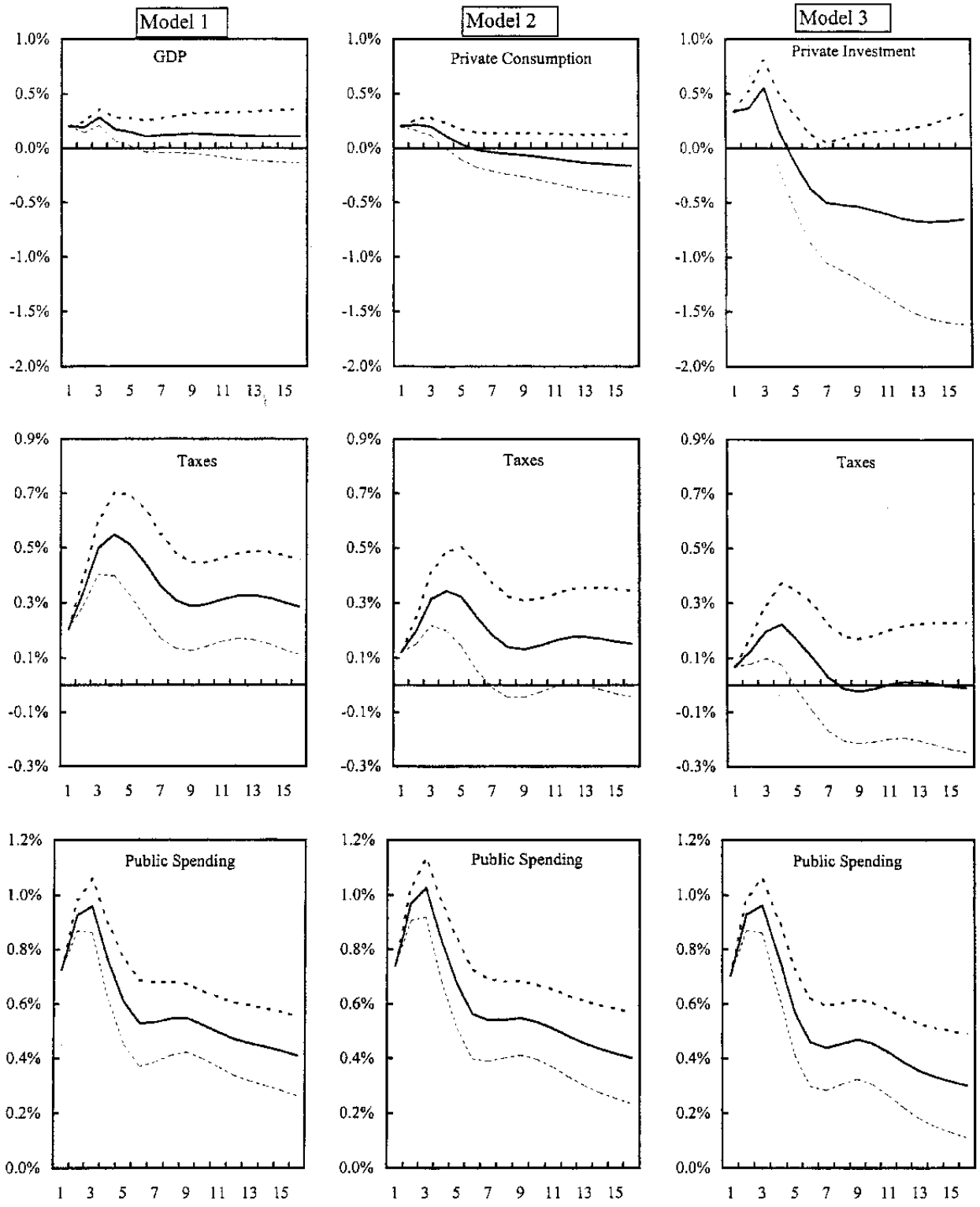
Figure 6. Spain: Impulse Response to a Tax Shock 1/



Source: Fund staff estimates.

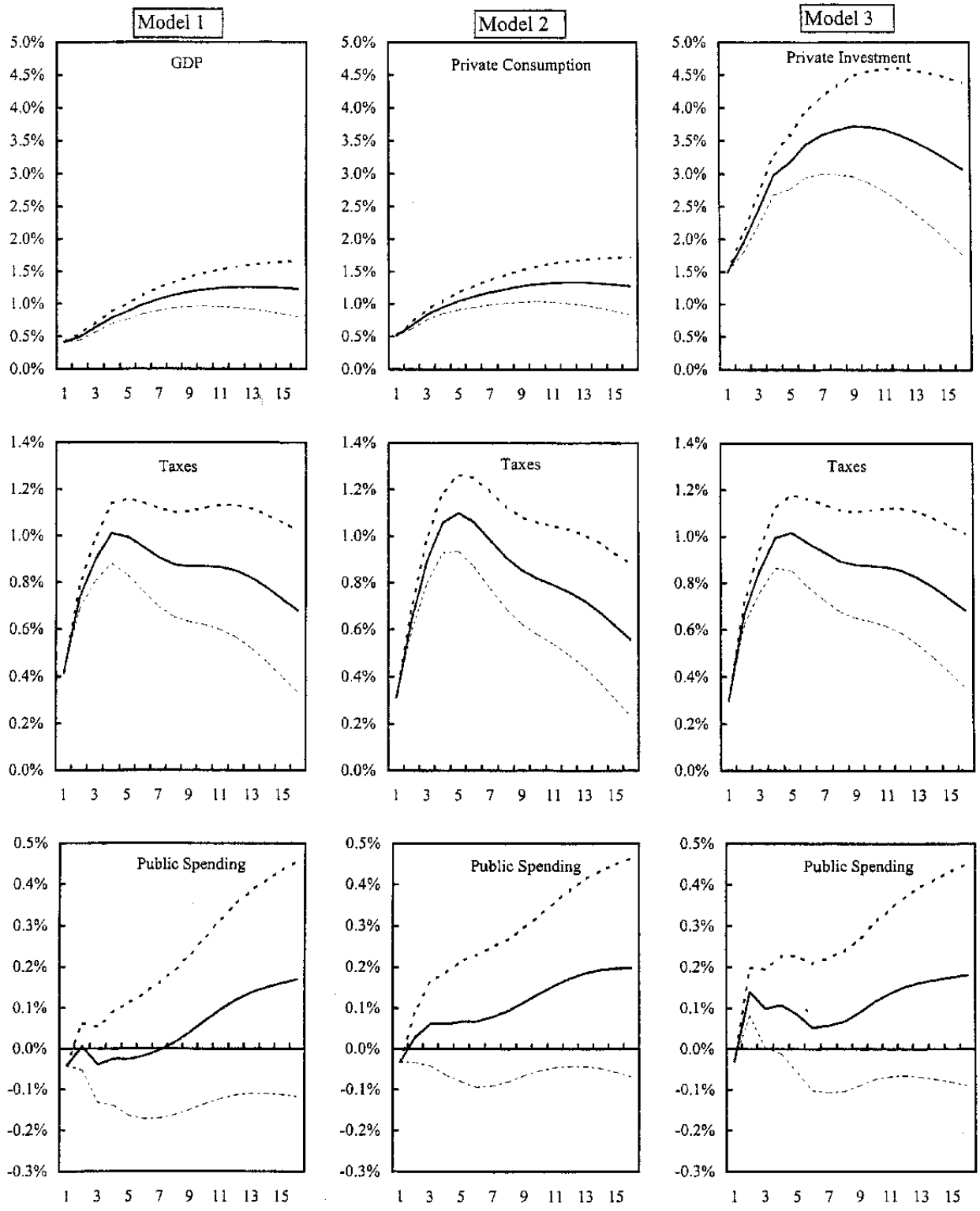
1/ Based on the structural model estimates in Table 2, using a VAR model with 4 lags.

Figure 7. Spain: Impulse Response to a Expenditure Shock



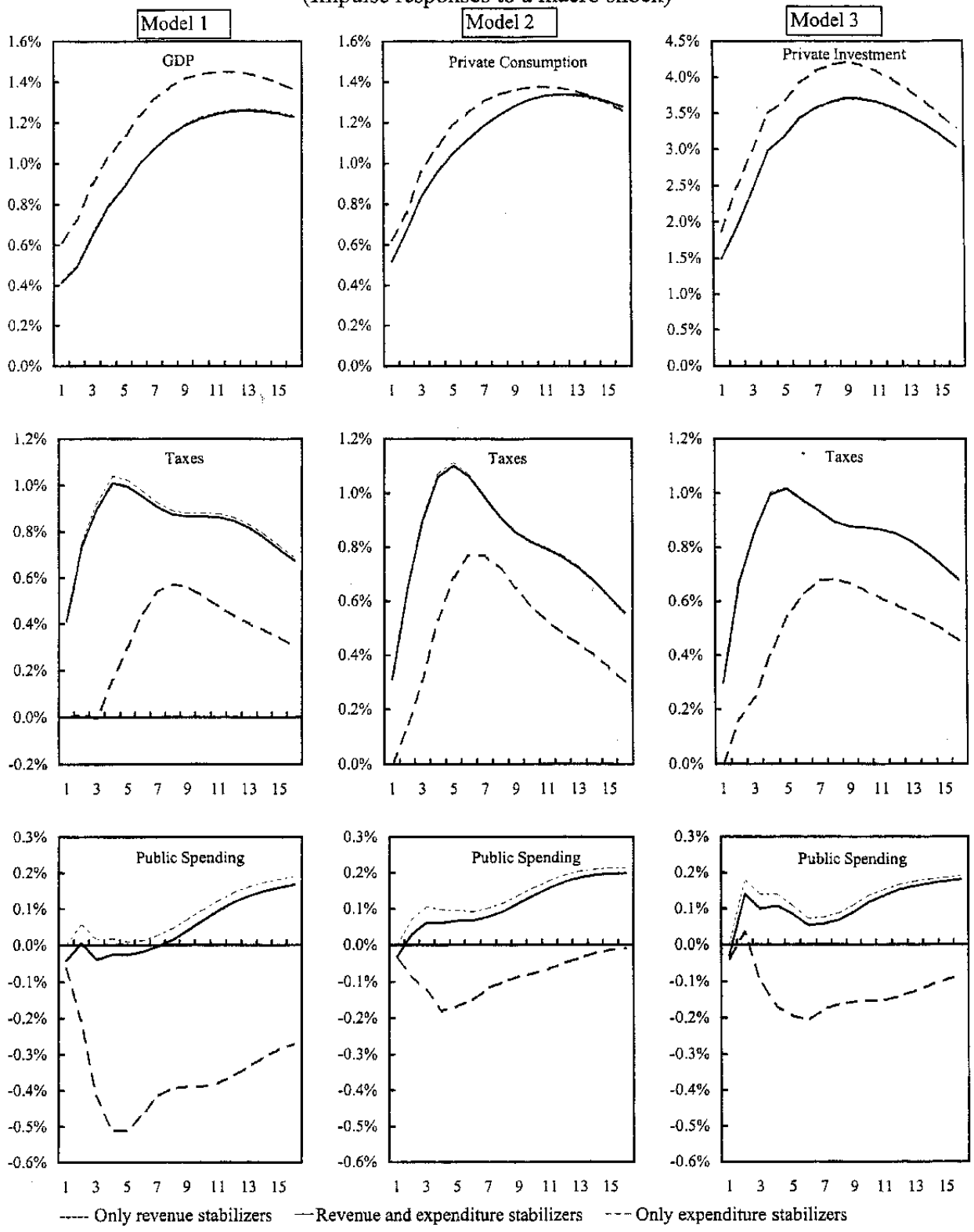
Source: Fund staff estimates.

Figure 8. Spain: Impulse Response to a Macro Shock



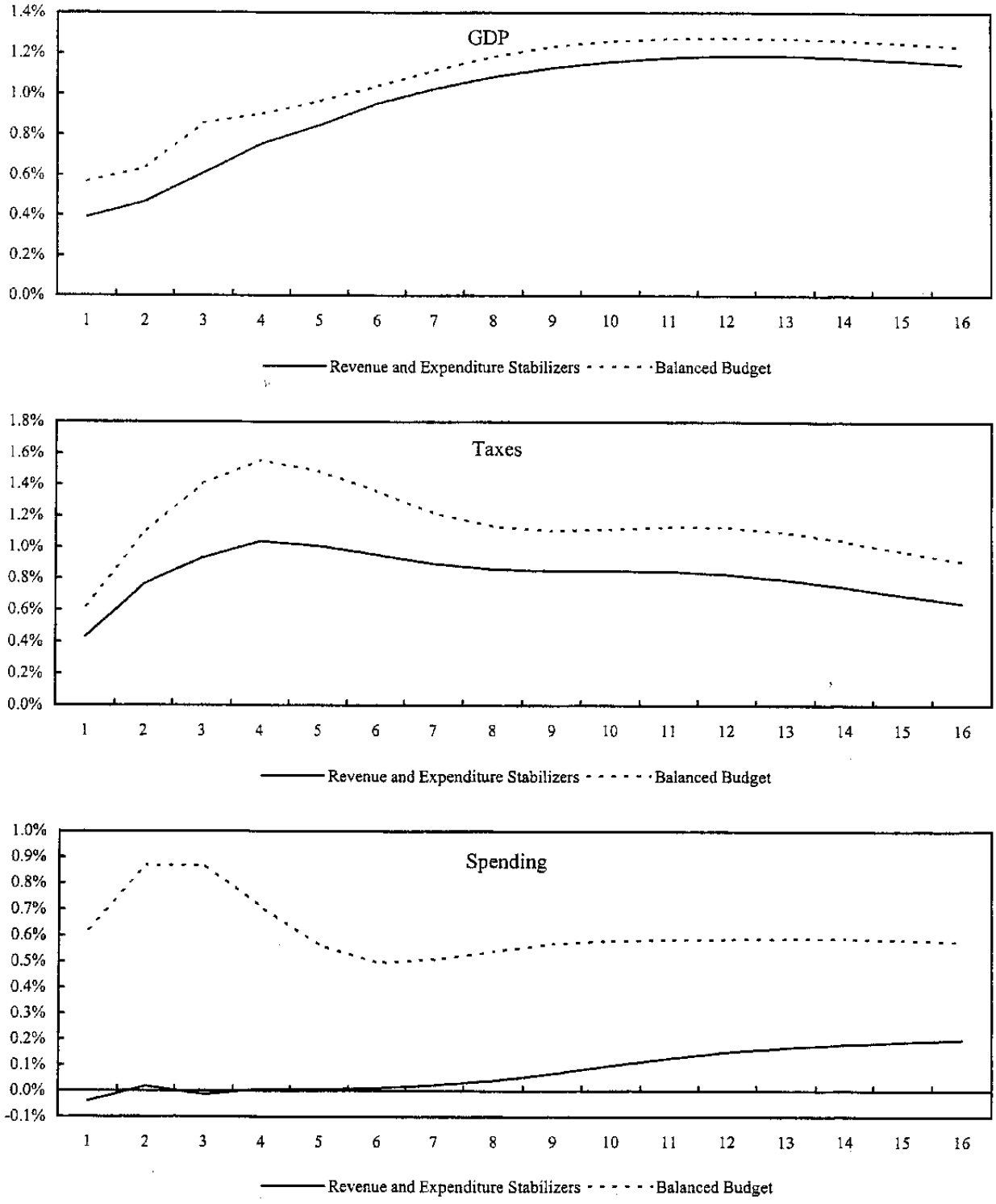
Source: Fund staff estimates.

Figure 9. Spain: Relative Importance of Revenue and Expenditure Stabilizers
(Impulse responses to a macro shock)



Source: Fund staff estimates.

Figure 10. Spain: Balanced Budget Policy
(Impulse responses to a GDP shock)



Source: Fund staff estimates.

Table 1. Determinants of Output Volatility

	Regressions						
	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)	(1.6)	(1.7)
Regressors:							
GTY	-0.035						-0.031
	(0.023)						(0.03)
OPEN		0.006					0.024
		(0.005)					(0.008)***
DISP			-0.006				-0.001
			(0.007)				(0.02)
NPC				-0.002			-0.003
				(0.001)*			(0.002)
EPL					0.000		0.001
					(0.001)		(0.002)
PMR						-0.002	0.002
						(0.003)	(0.003)
CONSTANT	0.032	0.015	0.020	0.020	0.016	0.020	0.023
	(0.011)***	(0.002)***	(0.004)***	(0.003)***	(0.003)***	(0.004)***	(0.013)
Observations	19	20	20	16	18	18	16
R^2	0.15	0.07	0.01	0.12	0.00	0.03	0.6
F-statistic	2.35	1.36	0.67	3.68	0.01	0.48	2.92*

Note. The dependent variable is the average (absolute value) of the output gap in 1990-2000. The definitions of the gap and of the regressors are contained in Appendix I. Robust standard errors are shown in parantheses, and significance at the 10, 5 and 1 percent levels is denoted respectively by *, **, and ***.

Table 2. Estimates of the BP Model, 1960-2001

A. Equations

$$\mu_t^T = a_1 \mu_t^X + a_2 \varepsilon_t^G + \varepsilon_t^T$$
$$\mu_t^G = b_1 \mu_t^X + b_2 \varepsilon_t^T + \varepsilon_t^G$$
$$\mu_t^X = c_1 \mu_t^T + c_2 \mu_t^G + \varepsilon_t^X$$

B. Coefficients

	Model		
	1	2	3
	GDP	Private Consumption	Private Investment
Parameters:			
a1 (tax elasticity)	1.00	0.60	0.20
b1(spending elasticity)	-0.10	-0.06	-0.02
a2 (tax decisions are first)	0.00	0.00	0.00
Estimates:			
b2	0.07	0.27	0.25
	(0.92)	(2.95)	(2.95)
c1	-1.28	-0.78	-2.45
	(5.71)	(5.46)	(6.11)
c2	0.63	0.40	0.72
	(4.67)	(4.04)	(2.57)

Note: Estimates are obtained using 144 quarterly observations from 1964-2000; the first four observations are used to condition the estimates. The model includes a time trend, and estimates are based on Bernanke (1986). Here these estimates are conditional on the OECD tax and expenditure elasticities (and are adjusted in Models 2 and 3 as discussed in Appendix II), and on the assumption that tax decisions are first. Details of the model are contained in the text; data definitions and sources are in Table 3 in Appendix I.

Data Sources and VAR Model Estimates

Table 3. Spain: Data Definitions and Sources

Variable	Definition	Source
GAP-OECD	Output gap	OECD Economic Outlook Database Inventory.
GAP-EC	Output gap	European Commission.
GDPN	Nominal gross domestic product	IFS, IMF.
GDPP	Gross domestic product deflator	IFS, IMF.
XGS	Exports of goods and services	IFS, IMF.
MGS	Imports of goods and services	IFS, IMF.
GTY	(Government total disbursements/GDPN)	OECD Economic Outlook Database Inventory.
OPEN	(1/2)((XGS+MGS)/GDPN)	
DISP	Power dispersion index	Henisz (2000).
NPC	Number of parties in the coalition	Perotti and Kontopoulos (1998).
EPL	Employment protection legislation index	OECD Employment Outlook (1999).
PMR	Product market regulation index	Nicoletti, Scarpetta and Boylaud (1999).
T	General government current receipts deflated by GDPP	OECD Economic Outlook Database Inventory.
G	General government current disbursements deflated by GDPP	OECD Economic Outlook Database Inventory.
GDP	Real gross domestic product	IFS, IMF.
C	Real private consumption	OECD Economic Outlook Database Inventory.
I	Real private investment	OECD Economic Outlook Database Inventory.

Table 4. Spain: VAR Estimates

	Revenue Equation			Expenditure Equation			Macro Variable Equation		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	GDP	C	I	GDP	C	I	GDP	C	I
Adjusted R^2	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Coefficient of determination (R^2)	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Sum of squared errors	0.0053	0.0052	0.0050	0.0078	0.0085	0.0078	0.0058	0.0059	0.0508
Standard error of estimate	0.0064	0.0063	0.0062	0.0077	0.0081	0.0077	0.0067	0.0067	0.0190
Durbin-Watson	2.12	2.12	2.03	2.12	2.08	2.06	2.04	2.01	1.91
F-Tests									
Revenues	475.8	464.1	498.1	4.0	2.5	3.7	1.1	1.4	1.2
Significance level	0.000	0.000	0.000	0.004	0.048	0.007	0.367	0.249	0.3
Public Spending	1.3	1.0	0.7	306.5	311.7	286.2	2.8	1.9	3.3
Significance level	0.282	0.406	0.627	0.000	0.000	0.000	0.030	0.116	0.0
Macro variable	3.7	4.2	5.8	4.1	0.9	4.2	879.5	1094.0	819.2
Significance level	0.007	0.003	0.000	0.004	0.460	0.003	0.000	0.000	0.0

Note: Based on quarterly data from 1964-2000. Each equation of the VAR model contains four lags, a constant, and time trend.

ELASTICITIES IN MODELS 2 AND 3

Note that the definitions of the elasticities in Box 1 can be expressed as:

$$a_1 \equiv \frac{d\log T}{d\log Y}, \qquad b_1 \equiv \frac{d\log G}{d\log Y}$$

but the elasticities in Models 2 and 3 are defined implicitly as:

$$\tilde{a}_1 \equiv \frac{d\log T}{d\log X}, \qquad \tilde{b}_1 \equiv \frac{d\log G}{d\log X}$$

where $X = C, I$. To obtain the elasticities in Models 2 and 3 from those in Model 1, the latter must be multiplied by $d\log Y / d\log X$, and thus the adjusted elasticities are obtained as:

$$\tilde{a} = \frac{X}{Y}\cdot a_1 \qquad \tilde{b}_1 = \frac{X}{Y}\cdot b_1$$

that effectively multiplies the elasticities by $d\log Y / d\log X$.

This adjustment is derived from a 1st order approximation of the national accounts identity, $Y = C + I + G + (X - M)$, that can be expressed as:

$$e^{\log Y} = e^{\log c} + e^{\log I} + e^{\log G} + e^{\log(X-M)}$$

and defining $f(\log Z) = e^{\log Z}$ the first order approximation (around Z_0, the sample mean) is:

$$\begin{aligned} f(\log Z) &= \frac{\partial f(\log Z)}{\partial \log Z}(\log Z - \log Z_0) \\ &= \frac{\partial e^{\log Z}}{\partial \log Z}\cdot(\log Z - \log Z_0) \\ &= e^{\log Z_0}\cdot(\log Z - \log Z_0) \\ &= Z_0\cdot(\log Z - \log Z_0) \end{aligned}$$

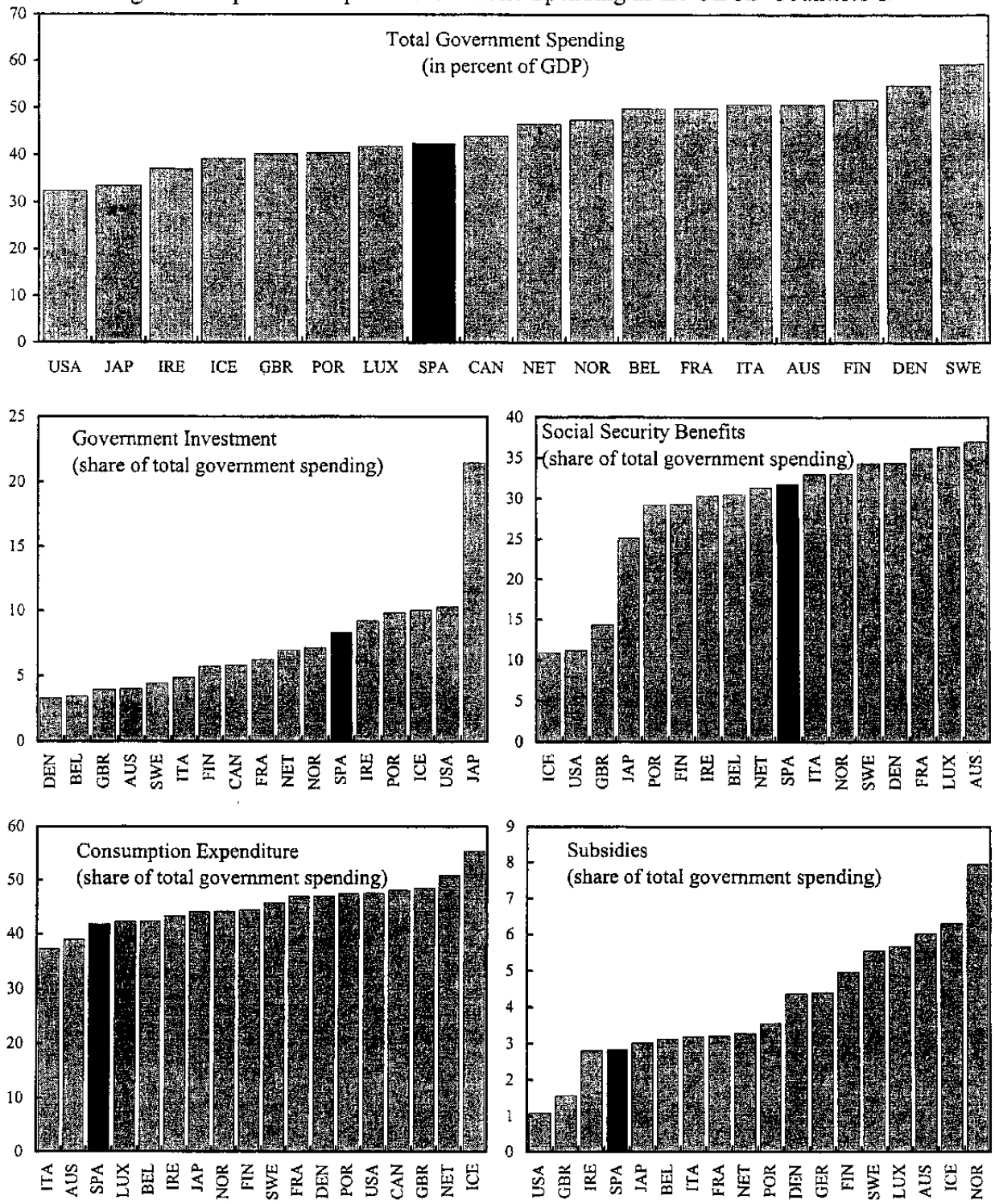
where $Z = Y, C, I, (X-M)$. Replacing these approximations in the identity renders:

$$Y_0(\log Y - \log Y_0) = C_0(\log C - \log C_0) + I_0\log(I - I_0) + \ldots.$$

and thus $d\log Y = C_0/Y_0\cdot d\log C + I_0/Y_0\cdot d\log I + \ldots$ From this last expression it is clear that multiplying the elasticities in Model 1 by X/Y ($= d\log Y / d\log X$) will result in the required elasticities.

DETAILS OF THE COMPOSITION OF TAXES AND EXPENDITURES

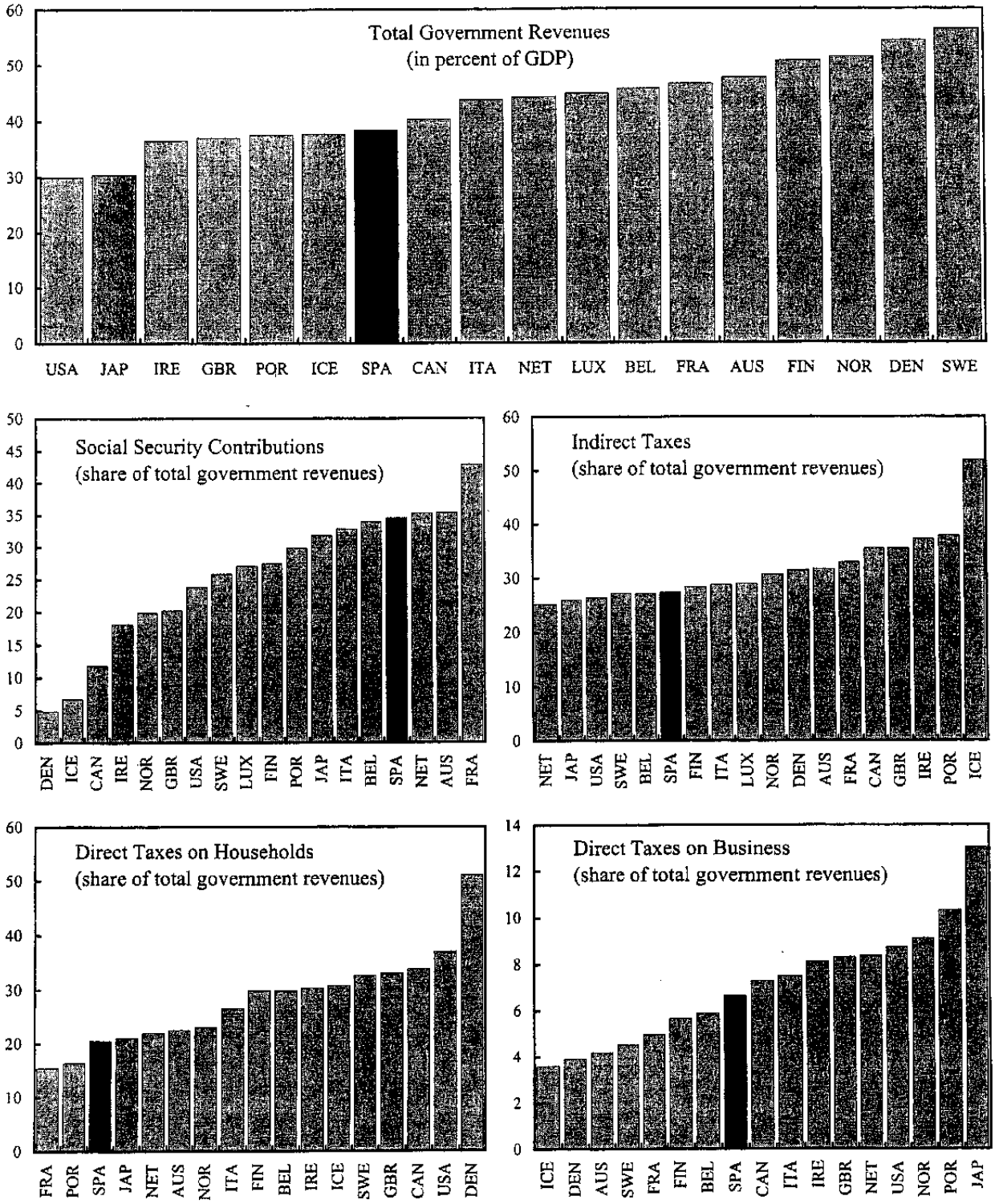
Figure 11. Spain: Composition of Public Spending in the OECD Countries 1/



Source: OECD.

1/ Averages from 1990 through 2000.

Figure 12. Spain: Composition of Public Revenues in the OECD Countries 1/



Source: OECD.

1/ Averages from 1990 through 2000.

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