



On the Effect of Fiscal Policies in Portugal

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Abstract

This paper estimates the effects on output of different fiscal policies in the context of a VAR model that includes several public spending and taxation variables. Empirical results suggest that the effects of fiscal policies are within the Keynesian paradigm for both direct and indirect taxes and for some but not all expenditure instruments. Indeed, while the results for public wages and public investment are Keynesian in nature, non-Keynesian effects dominate in the case of public transfers and possibly in the case of intermediate consumption. Finally, public investment shows particularly strong positive effects while direct taxation shows particularly strong negative effects.

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1. Introduction

The need for budgetary restraint has been the central feature of the economic policy debate in Portugal in recent years. The existence and persistence of substantial public deficits has become a matter of great concern in that it limits public choices and conflicts with international commitments in the context of the Stability and Growth Pacts associated with the European Monetary Union. There are two important practical corollaries of this situation. First, finding ways to control the public deficit while not jeopardizing long-term economic performance is a central concern. Second, new budgetary initiatives tend to be conceived in revenue-neutral terms. For both, the knowledge of the expected effects of fiscal policies in Portugal is of paramount importance. The objective of this paper is to provide empirical evidence on this matter.

Fiscal policy has traditionally been considered as an effective instrument for generating revenue, redistributive purposes, smoothing cyclical behavior, etc. Notwithstanding, we know relatively little about the long-term macroeconomic effects of fiscal policies, and there is little consensus among economists as to the magnitude and even the sign of such effects [see, for example, Perotti, (2005)]. In recent years, however, a large body of research has attempted to estimate the macroeconomic effects of distinct fiscal policies through the use of vector autoregressive models (VAR), models routinely used to evaluate the effects of monetary policy [see Kamps (2005) for a discussion of estimates of the effects of public investment and Perotti (2004) for a review of the macroeconomic effect of various tax policies]. VAR models have clearly become the instrument of choice in the debate on the macroeconomic impact of fiscal policy.

The possibility that the long-term effects of fiscal policy may differ from the Keynesian paradigm was first investigated by Giavazzi and Pagano (1990 and 1996). More recently, various authors (see, for example, Blanchard and Perotti 2002, Cerda et al 2006, De Castro 2003 and 2006, Perotti 2005, Von Hagen et al 2001) have used VAR models to estimate the long-term macroeconomic effects of fiscal policies in various countries, supporting the existence of important long-term non-Keynesian effects. Overall, the issue of the sign and magnitude of the effects of fiscal policy is very much an open question in general, and more so in the Portuguese case.

2. Data and Methodology

We follow Blanchard and Perotti (2002), and use VAR estimates that include public spending, taxation and output to obtain the long-term effects on output of different fiscal policies. Since both public spending and taxation affect output and the two variables are not independent, to estimate the effects of one variable, the other must be included. While these and other authors, however, consider total public spending and total taxation (net of transfers) in this paper we consider expenditure and taxation at a more disaggregated level.

We use annual data in real terms (millions of 1995 euros) for 1977-2004 published by Eurostat and generated following the ESA95 methodology. In addition to output we consider four public spending categories covering about 88% of public spending in the last decade and two types of taxes covering about 85% of the revenues. Specifically, we consider *current transfers* (GTR), which represents about 12.2% of

GDP in the last decade, *intermediate consumption* (GIC), 5.3 %, *compensation of employees* (GW), 14%, *public investment* (GFBC), 3.7%, *direct taxes* (TD), 20.6%, and *indirect taxes* (TIND), 13.9%.

In terms of the empirical implementation, we start by determining the order of integration of the variables. The unit root results are based on the ADF test, selecting the optimal number of lags according to the BIC test and including deterministic components when statistically significant. The test results suggest that all of the series are non-stationary in log-levels and stationary in first differences of log-levels. We, therefore, proceed to estimate a VAR model in first differences of log-levels of the variables. For the VAR specification, we use the AIC, BIC, and maximum likelihood ratio tests. All tests suggest that the best specification is a first order VAR with a constant. It should be mentioned that dummy variables were considered in all these tests to allow for possible structural breaks in 1986, year in which Portugal joined the European Union, and 2001, year in which Portugal joined the euro zone. We found no evidence of structural breaks, and therefore we found no evidence that the macroeconomic effects of fiscal policies would be significantly affected by these changes.

Our estimates of the effects of fiscal policies are based on the impulse response functions associated with the VAR estimates. We use the Cholesky decomposition to orthogonalize the innovations and resort to standard economic reasoning to decide on the ordering the variables. We assume that output affects tax revenues contemporaneously but the converse is not true, and that public expenditure affects output and tax revenues contemporaneously but the converse is not true. These assumptions imply that the ordering of the variables is public spending, output, and tax revenues. More specifically in terms of the specific spending and tax revenue variables the assumptions are as follow. Public investment is contemporaneously affected by the other expenditures but the converse is not true. In turn, current transfers are not affected contemporaneously by any of the other expenditure categories while intermediate consumption affects compensation of public employees. Finally, we assume that indirect tax revenues do not affect direct tax revenues contemporaneously, but the opposite is true. These assumptions imply that the order of the variables in the central case is GTR, GIC, GW, GFBC, DGP, TD, and TIND.

3. Results

Our estimates of the elasticities and marginal products of output with respect to the different fiscal variables are presented in Table 1. These indicators are based on the effects accumulated over a 10-year period, although most effects occur in the first few years. We present the central results under the orthogonalization strategy discussed above and the range of variation across all possible orderings of the disaggregated expenditure and tax variables.

(insert Table 1)

Our estimates suggest that there is a certain degree of diversity in the effects of public spending. The elasticities of output with respect to public investment and to compensation of employees are positive, 0.173 and 0.269, respectively, and very robust across orthogonalization strategies. The elasticity of intermediate consumption is much smaller, 0.019, and not always positive across the different

orthogonalizations. Finally, the elasticity of public transfers is clearly negative, -0.096 , and consistently so across the different cases. In turn, the elasticities of output with respect to tax changes are negative -0.468 and -0.139 , for direct and indirect taxation respectively, and are uniformly so across the range of results. Overall, our results are consistent with the Keynesian paradigm for all tax instruments and for some but not all expenditure instruments.

To have a better idea of the comparative effects of different fiscal changes we consider their marginal products calculated in the conventional manner from the elasticities and the ratios of the fiscal variables to GDP. We use average ratios for the last ten years of the sample period, which allows us to interpret the marginal products as the accumulated long-term effects of policies implemented at the end of the sample period considering the economic situation at that time without allowing for contamination by business cycle effects.

The marginal product figures suggest that the effects of a one-euro innovation in public transfers and intermediate consumption are small but of opposite signs, -0.79 and 0.36 euros, respectively while the marginal product of public wages is more substantial, 1.92 euros, and of public investment even more so, 4.68 euros. In turn, innovations in tax revenues lead both to significant negative marginal products of -2.27 for direct taxes and -1.00 for indirect taxes. Overall, the sign and magnitude of the marginal products indicate that output will be reduced substantially in response to unexpected tax increases, while the effects of increases in expenditure exhibit greater variability.

The marginal product figures allow us to identify the impact of budget-neutral fiscal policies, i.e., simultaneous increases of one euro in any given expenditure and tax revenue instrument. Clearly, the effects on output of such policies depend on the combination of expenditure and taxation instruments considered. Increases in public transfers and intermediate consumption have net negative effects on output regardless of whether they are financed by direct or indirect taxes. Increases in public wages have net negative effects on output if financed through direct taxation but positive if financed through indirect taxation. Finally, increases in public investment have net positive effects regardless of the type of financing.

4. Conclusions

In this paper we estimate the output effects of different fiscal policies in Portugal based on a VAR model that includes several public expenditure and tax revenue instruments. Empirical results suggest that the effects of fiscal policies are within the Keynesian paradigm for both tax instruments considered, direct and indirect taxes, and for some but not all expenditure instruments. In fact, while the results for public wages and public investment are Keynesian in nature, non-Keynesian effects dominate in the case of public transfers and possibly in the case of intermediate consumption. Public investment shows particularly strong positive effects while direct taxation shows particularly strong negative effects.

From the perspective of fiscal consolidation our results have clear implications. If the government wants to control the public budget while minimizing the costs for the economy, the most promising strategy would be cuts in public transfers and intermediate consumption. Cuts in public wages and public

investment would be much more problematic while any tax increases, in particular of direct taxes, would be undesirable.

In turn, when considering revenue-neutral policies, our results imply that positive effects on output would be generated primarily by reductions in either direct or indirect tax revenues compensated by reductions in public transfers or intermediate consumption and by increases in public investment financed by either direct or indirect taxes.

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Table 1.
Effects of fiscal innovations

	Output Elasticity	Marginal Product
GTR		
Central case	-0.096	-0,79
Rang of variation	(-0.083 / -0.117)	(-0.68 / -0.96)
GIC		
Central case	0.019	0,36
Rang of variation	(0.019 / -0.049)	(0.36 / -0.92)
GW		
Central case	0.269	1,92
Rang of variation	(0.180 / 0.269)	(1.29 / 1.92)
GFBC		
Central case	0.173	4,68
Rang of variation	(0.173 / 0.179)	(4.84 / 4.68)
TD		
Central case	-0.468	-2,27
Rang of variation	(-0.401 / -0.468)	(-1.95 / -2.27)
TIND		
Central case	-0.139	-1,00
Rang of variation	(-0.139 / -0.304)	(-1.00 / -2.19)