

ON THE INSURANCE FUNCTION OF FISCAL POLICY IN A MONETARY UNION

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Abstract

In this paper we first review the available literature on the degree of insurance against shocks, provided by the central budget in the federal systems already existing. Next, we discuss the main points raised on the debate about the implementation of an automatic mechanism designed to cope with country-specific shocks in a monetary union, and present a specific proposal of such a mechanism.

Key words: Monetary union, fiscal federalism, insurance function.

JEL classification: E62, E63.

1. Introduction

Allocation, redistribution, and stabilisation are considered as the traditional functions of fiscal policy. Allocation (i. e., the provision of public goods) is usually performed through government expenditures, but redistribution and stabilisation also depend on the tax and transfer system. In its turn, redistribution is addressed to correct structural disequilibria and reduce regional disparities, while the stabilisation function has as its main objective to counteract the economy's fluctuations. However, depending on the origin of fluctuations, we can distinguish between the stabilisation function in itself and the insurance function of federal fiscal policy (Eichengreen, 1993). The stabilisation function of fiscal policy would try to offset the effects of a shock affecting to all the regions or countries belonging to a greater area (i. e., a common or symmetric shock), while the insurance function would try to counteract a region or country-specific shock (i. e., an asymmetric shock). In other words, the difference between stabilisation and insurance would be related to the symmetry or asymmetry of the shocks.

The formation of a monetary union by 11 member countries of the European Union (EU), following the adoption of a common currency, the Euro (leading to the so-called Economic and Monetary Union, or EMU), has increased the concern for this issue. In this way, a wide range of studies on the nature of the shocks that might eventually affect to the member countries of EMU has appeared in last years; see, among others, Bayoumi and Eichengreen (1993), Erkel-Rousse and Méritz (1995), and Driver and Wren-Lewis (1999). In general, all of them agree on the importance of fiscal policy to offset country-specific shocks, but there is not concluding evidence on the higher or lower probability of suffering country-specific shocks in a monetary union. For that reason no consensus has emerged yet, either on the degree of stabilisation *versus* insurance required, or on the way of implementing these fiscal policy functions.

In federal states, as well as in monetary unions, the central budget plays a key role in the implementation of the redistribution and stabilisation functions of fiscal policy. In particular, a federal fiscal system based on progressive taxes and transfers can perform both functions simultaneously, since tax revenues (transfers) would be smaller (higher) in those regions with lower incomes, leading to redistribution; and tax revenues (transfers) would decrease (increase) as income falls, leading to stabilisation. Assuming that tax revenues decrease and transfers increase following a recession, several

empirical studies have tried to quantify the degree of stabilisation provided by the central budget in the federal systems already existing; see, among others, Sala-i-Martin and Sachs (1992), von Hagen (1992), Goodhart and Smith (1993), Pisani-Ferry, Italianer and Lescure (1993), and Bayoumi and Masson (1995). Their results are not very conclusive since they overlap redistribution and stabilisation, and they do not properly distinguish stabilisation from the insurance function of fiscal policy.

Some of the studies quoted before relate the experience of the existing federations with the management of fiscal policy in EMU, concluding that the size of the EU budget is not big enough to provide stabilisation. Because of that, another question broadly discussed has been the possibility of designing some kind of automatic mechanism able to produce a similar degree of stabilisation to that provided by federal budgets; see, among others, Majocchi and Rey (1993), Italianer and Vanheukelen (1993), Mélitz and Vori (1993), and von Hagen and Hammond (1998).

As mentioned above, most studies on the role of fiscal policy in monetary unions have discussed the degree of stabilisation and insurance provided by a federal-level budget, as well as the design of an automatic insurance mechanism in order to face country-specific shocks. However, there is not a full agreement on these issues since the scope of the proposals is an empirical question. In this paper we will try to clarify these questions. First, we will review the available empirical evidence on the stabilisation provided by federal systems (section 2). Second, we will discuss the main points regarding the implementation of an automatic mechanism against country-specific shocks in a monetary union (section 3). And third, we will offer a specific proposal of an insurance mechanism for a monetary union (section 4). Some concluding remarks are presented in section 5.

2. Stabilisation in federal fiscal systems

The proposal of establishing an insurance mechanism has some tradition in the classical literature on optimum currency areas (Kenen, 1969). More recently, in Sala-i-Martin and Sachs (1992) we can find the first empirical study on this issue. They start from the assumption that the US federal budget automatically absorbs the effects of shocks. The contribution of the fiscal system to stabilisation is computed from the elasticities of *per capita* federal government's tax revenues and transfers, with respect to *per capita* disposable income, net of taxes and transfers. The authors use data for the nine census regions of the US, during the period 1970-1988.

From estimated elasticities of -0.327 and 1.275 for transfers and taxes, respectively, Sala-i-Martin and Sachs (1992) evaluate the percentage of absorption of the shock through the federal budget at 0.387 . In other words, federal transfers and taxes, taken together, would absorb around 40 per cent of the shock. The authors conclude that the US budget provides automatic stabilisation mainly through the tax system, given that the tax-income elasticity is greater, in absolute value, than the transfer-income elasticity. And, by extending their results to Europe, they infer that it would be difficult to find a similar degree of stabilisation because the European fiscal system is not harmonised enough and the size of its budget is relatively small.

In a subsequent contribution, von Hagen (1992) starts from the same kind of assumption than Sala-i-Martin and Sachs, but argues that their results are ambiguous. The reason is that, by estimating their equation in levels, redistributive and stabilising effects overlap. In addition, since their method does not allow them to capture changes in the variables along time, the possibility of distinguishing between the effects of transitory and country-specific shocks, on the one hand, and permanent and common shocks, on the other, is not clear. In order to clarify these issues, von Hagen's analysis is performed with the variables transformed into first differences.

In this way, the role of the fiscal system in stabilisation is computed from the elasticities of the changes in tax revenues and transfers (excluding social security due to its redistributive effects), with respect to changes in the gross state product (a wider measure of economic activity). The data are for the 51 states of the US, during the period 1981-1986. The estimated elasticities are -0.17 and 0.985 for transfers and

taxes, respectively, leading to a percentage of absorption of the shock through the federal budget of 0.0984, that is, around 10 per cent. The strong discrepancy between the degree of insurance provided by the federal budget found in both studies (40 per cent for Sala-i-Martin and Sachs, and 10 per cent for von Hagen) is not only related to the different specification of the estimated equations, but also to the definition of the variables and the different sample period.

Goodhart and Smith (1993) reply previous studies, trying to find the source of the difference in results between them. They argue that the degree of fiscal compensation depends on the nature of the shock, so that, if these effects are equally distributed across regions the redistributive role of fiscal policy will be needed; but when the effects are not uniformly distributed, which is required is an insurance mechanism.

In order to find the degree of coverage provided by the federal budget, variables are measured both in levels and in first differences. As in von Hagen (1992), the data for the US are for the period 1981-1986, but they exclude the major oil-producer states. The analysis is also applied to Canada and the UK.

From the equations estimated in levels, the results show a degree of shock absorption of 13 per cent in the US, between 11 and 15 per cent in Canada, and 21 per cent in the UK; and, when estimating in first differences the results are 11 per cent for the US, between 12 and 17 per cent for Canada, and 21 per cent for the UK. Hence, the figures show no strong differences between the two methods, and redistributive effects are close to stabilisation effects. Goodhart and Smith conclude that the discrepancies between previous studies may be due to the definition of the variables, problems of endogeneity, and the different sample period.

Bayoumi and Masson (1995) use variables in levels and first differences, as well as cross-section and time-series data, in order to distinguish between redistribution and stabilisation, respectively. In the case of redistribution, the impact of fiscal variables (taxes, social security, transfers and grants) is measured in response to long-term income differentials across regions. On the other hand, when analysing stabilisation, the impact of fiscal variables is measured in response to short-term deviations of the

economic variable (*per capita* income before taxes) from a growth path, although the insurance function of fiscal policy is not explicitly identified. In any case, since fiscal variables are added in a sequence, the difference between the coefficient estimates measures the effect of including that variable. The data are for 48 states of the US between 1969 and 1986, and for 10 Canadian provinces between 1965 and 1988.

The authors find a redistribution effect of 22 per cent for the US, and 39 per cent for Canada, and a degree of stabilisation of 30 per cent for the US and 17 per cent for Canada, with the greater role in stabilisation given by transfers. Bayoumi and Masson's results, then, suggest that both the studies of Sala-i-Martin and Sachs, and von Hagen, overestimate the stabilising effect of the tax system. The reason is related to the variables used in the empirical analysis, since *per capita* regional tax payments, relative to national *per capita* tax payments, change with the cycle, but the same is not true for transfers. On the contrary, Bayoumi and Masson take the ratio of regional and national incomes alternatively adjusted for taxes, and for taxes plus transfers. Assuming that taxes are proportional to income, and that transfers are independent of the level of activity, these definitions allow them to show how transfers smooth the economic cycle.

Pisani-Ferry, Italianer and Lescure (1993) do not perform a regression analysis for evaluating the stabilisation properties of federal budgets. Using a two-sector simulation model, they try to measure the scope of the automatic stabilisation (insurance) provided by the fiscal system, following the occurrence of a shock. The model represents a region within a federal monetary union, and is calibrated paying special attention to the major tax and expenditure categories. They stress the role of social security payments (neglected by von Hagen) and the unemployment benefit at the federal level, which does not exist in the US economy.

In their results, Pisani-Ferry *et al.* find that the degree of stabilisation provided by the US federal budget would have been lower than in several European countries such as Germany and France, due to the fact that in the US there is no unemployment benefit at the federal level. The authors obtain an effect of 17 per cent for the US, 37 per cent for France, and between 34 and 42 per cent for Germany, depending on whether transfers among regions are included or not. They also found that stabilisation is mainly provided by budget items not transferable to the EU budget in the medium run

(unemployment benefit, social security, and interregional grants). From here, they conclude that EMU would be viable keeping relatively independent fiscal policies, without being necessary either any budget reform or creating automatic mechanisms to implement the insurance function.

Finally, Goodhart and Smith (1993) also perform a simulation analysis, as an alternative to the regression method. They study the effects of the tax system using the Tax and Benefit Model built in the Institute for Fiscal Studies (i. e., a representation of the United Kingdom tax and social security regulations applied to a representative sample of households), obtaining an effect of 34 per cent for the case of UK, due to the effect of taxes. From here, and taking into account the difficulties to recognise any short-run fluctuations, they conclude that an adequate fiscal policy coordination would be enough in order to insurance the different economies against the occurrence of shocks. The reason is that policy interventions do not always deal with shocks at a proper time, so policy measures might become counterproductive.

Summary

We have just reviewed how several empirical studies have tried to quantify the degree of insurance provided by the central budget. These studies use two alternative methods in order to quantify the contribution of fiscal variables to smooth the business cycle: regression analysis and simulation analysis. As can be seen in Table 1, the results show sensible discrepancies due to the variables chosen, the sample period and the different methods of analysis.

TABLE 1
Stabilisation in federal fiscal systems

STUDIES	METHODS	SOURCE OF STABILISATION	RESULTS
	REGRESSION		
Sala-i-Martin and Sachs (1992)	Variables in levels	Taxes	40% (US)
von Hagen (1992)	Variables in 1st differences	Taxes (excludes social security)	10% (US)
Goodhart and Smith (1993)	Variables in 1st differences	Taxes	11% (US) 12-17% (Canada) 21% (UK)
Bayoumi and Masson (1995)	Variables in 1st differences	Transfers	30% (US) 17% (Canada)
	SIMULATION		
Pisani-Ferry <i>et al.</i> (1993)	Two-sector model	Transfers, social security, unemployment benefit	17% (US) 37% (France) 34-42% (Germany)
Goodhart and Smith (1993)	IFS Tax and Benefit Model	Taxes	34% (UK)

3. Insurance mechanisms in monetary unions

We have seen in the previous section that there are no clear empirical results regarding the degree of stabilisation provided by the central budget in the federal fiscal systems already existing. As a consequence, no consensus has emerged on the degree of fiscal federalism actually needed in monetary unions. It is true that, in principle, a system of tax and transfers could absorb the effects of a shock. However, from an empirical point of view, the coverage provided by the federal budget might be achieved by different budget items, and the exact amount of the coverage is still an open question.

Regarding the case of EMU, the size of the EU budget is too small to play the same role than the US budget. And, since embodying the insurance function of fiscal policy into the EU budget is not possible in the medium run, several studies have proposed the design of a mechanism able to cope with country-specific shocks. Next, we will discuss the different proposals available.

Majocchi and Rey (1993) start from the idea that stabilisation policy should be carried out at the federal level, and that, if implemented at the European level, this would require an increase in the size of the budget, with a subsequent fiscal reform. The fiscal system should include new revenue sources, and since these reforms are not feasible in the short run, they propose as insurance mechanism a “contingency fund” to deal with country-specific shocks, which should operate in a discretionary way to avoid moral hazard problems. The authors also suggest that the mechanism should be financed by the member countries in an *ad hoc* way. The amounts to be paid would be conditioned in order to assure its consistency with the Community’s objective, and the fund could be used only if the shock did not originate from a policy failure.

Italianer and Vanheukelen (1993) agree with Majocchi and Rey in the need of an insurance mechanism at the federal level. They present two variants: a full stabilisation mechanism, to offset any kind of country-specific shocks, and a limited stabilisation mechanism, to offset only severe country-specific shocks. The latter is explicitly designed to perform the insurance function of fiscal policy, and could be activated either automatically or in a discretionary way, depending on whether governments are required to justify that the origin of the shock was beyond their control or not. These

characteristics of the mechanism should guarantee automaticity and fiscal autonomy, and avoid moral hazard. However, the authors conclude that the degree of insurance provided would depend on the indicator of the shock, and on the size of the payment received. Italianer and Vanheukelen propose as indicator the change in the unemployment rate, but the financing of the mechanism remains an open question.

On the other hand, Mélitz and Vori (1993) analyse the possibility of designing an insurance mechanism that would avoid redistribution, concluding that, if feasible, the benefits from it would be too small. They start from the assumption that any kind of insurance system based on unemployment compensation would imply redistribution in the long run, which leads the authors to analyse a mechanism based on income insurance. Next, they examine how insurance could offset different kinds of shocks, and find little evidence on the incidence of common shocks with country-specific effects in Europe. From here, they conclude that the EU would be close to an optimum currency area not requiring a centralised insurance mechanism. Also, according to Mélitz and Vori the insurance function should be instrumented at the national level, since this should be designed to overcome the loss of national independence in the use of macroeconomic policy associated with EMU.

Finally, von Hagen and Hammond (1998) investigate how an insurance mechanism against country-specific shocks would work in a monetary union. The desirable properties of such a mechanism should be simplicity, automaticity, not leading to long-run redistribution, avoiding moral hazard, non-regressivity, budget neutrality, and economic significance. The authors argue that such characteristics cannot be achieved simultaneously, so they study a series of redistributive or stabilising mechanisms according to different properties included in their design. Their results show, firstly, that the higher the econometric complexity, the higher the degree of stabilisation provided; simpler mechanisms would imply redistribution, unless a high degree of economic integration would have been previously achieved. Secondly, they found that the potential benefit of an insurance scheme is an empirical question that remains in doubt, concluding hence that an automatic mechanism would not be necessary.

Summary

Table 2 summarises the proposals discussed above, on the need of an insurance mechanism in a monetary union. These proposals balance the degree of automaticity required, the proper level of government to implement the mechanism, the equilibrium between redistribution and stabilisation, and the origin and destination of the funds. But since the degree of coverage is an empirical question that depends on the characteristics of the mechanism, there is no unambiguous conclusion on the need of such a policy instrument.

TABLE 2

Desirability of an insurance mechanism in a monetary union

I. <u>An automatic insurance mechanism would be useful</u>	
a) At the federal level	
a.1) Discretionary	Majocchi and Rey (1993)
a.2) Automatic	Italianer and Vanheukelen (1993)
b) At the national level	Méltz and Vori (1993)
II. <u>An automatic mechanism would not be necessary</u> von Hagen and Hammond (1998)	

4. An insurance mechanism against country-specific shocks in EMU

In this section we will propose a simple insurance mechanism, specifically designed to compensate to those countries experiencing country-specific shocks in a monetary union. A more detailed exposition can be found in Bajo-Rubio and Díaz-Roldán (2000), where an empirical application to the 11 countries participating in EMU is also provided.

The proposed mechanism uses as indicator of the occurrence of a shock the changes in the unemployment rate of the countries belonging to the union. The condition for a country to receive any payment from the mechanism would be to experience a positive change in its unemployment rate, provided that at least one of the other countries would have registered a decrease in its unemployment rate during the same period. Notice that the latter condition guarantees the asymmetry of the shock. Since in our empirical example we used monthly data, changes in unemployment refer to the same month of the previous year.

The mechanism would be financed from a fund built from contributions of the union's member countries as a percentage of their tax collections (in the empirical application we used VAT collections). Since these are procyclical, the countries not affected by the unfavourable shock would contribute proportionally more than those affected. The fund would be distributed among the countries suffering the shock according to the proportion in which every one of them would have been affected. In this way, each country affected by the unfavourable shock would receive a higher amount of the fund, the higher were the relative increase in its unemployment rate, and the lower were the number of countries suffering the shock and hence receiving compensation. In other words, the proposed mechanism "stabilises more" the more country-specific is the shock, so that it exclusively performs the insurance function. In addition, the fund should be fully distributed every period, in order to avoid any redistribution in the long run.

Finally, the degree of coverage provided by the mechanism to any country suffering the shock, could be measured by the ratio of the total payments received throughout the year to the size of the shock. In its turn, the latter could be proxied by the

difference between the GDP levels in absence of the shock, and in presence of the shock, computed from an estimation of the Okun's law for the 11 countries participating in EMU. The results of applying this procedure to the empirical example in Bajo-Rubio and Díaz-Roldán (2000) are shown in Table 3, for the countries satisfying the requirements to benefit from the mechanism in the year of reference (1997), and for several alternative percentages of the tax collections given up by each country (denoted by α). As can be seen, the degree of coverage obtained would not be very far from those found in the literature surveyed in section 2. Notice that the higher degree of coverage enjoyed by France (and, to a lower extent, Italy) would be related to the shorter (7 months) but relatively strong unfavourable shock she had experienced in the year of reference; in other words, the coverage would be higher the more country-specific is the shock.

**TABLE 3: Annual coverage provided by the insurance mechanism
(in percentage of the size of the shock)**

	Germany	France	Italy	Luxembourg	Austria
$\alpha = 1\%$	12.38	15.47	13.19	12.24	12.43
$\alpha = 0.9\%$	11.14	13.92	11.87	11.02	11.19
$\alpha = 0.75\%$	9.29	11.60	9.90	9.18	9.32

Source: Bajo-Rubio and Díaz-Roldán (2000), Table 5.

To conclude, notice that the insurance mechanism proposed in Bajo-Rubio and Díaz-Roldán (2000) is specifically designed for the case of country-specific shocks, so that the insurance function would be properly addressed, without confusion with either the redistribution or stabilisation functions, unlike previous studies on the subject. On the other hand, even though it is obvious that such a mechanism could raise moral hazard issues, introducing a temporal limit to the reception of funds can mitigate it. In any case, since the degree of coverage provided by the insurance mechanism should be designed to be relatively modest, rather than to fully offset the occurrence of a shock, this should contribute in itself to minimise moral hazard problems. Finally, it should be noticed that, even though the usefulness of the insurance function has been widely recognised, some authors [such as, e. g., Mélitz and Vori (1993)] have proposed that this should be

performed at the national states' level, rather than to the EMU-wide level. This is no doubt an open question, for which there is no clear answer. However, if we recall that, once EMU is under way, "politicians and commentators will, rightly or wrongly, blame the severity of cyclical downturns on monetary union" (Goodhart, 1995, p. 470), the availability of an EMU-level based automatic insurance mechanism could help to sustain political support for EMU in temporarily disadvantaged countries.

5. Concluding remarks

In this paper we first reviewed the available empirical studies aimed to quantify the degree of insurance against shocks, provided by the central budget in the federal systems already existing. The results of this literature are not very conclusive since redistribution and stabilisation are frequently overlapped, and stabilisation is not properly distinguished from the insurance function of fiscal policy. Next, we discussed the main points raised in the literature regarding the implementation of an automatic mechanism, designed to cope with country-specific shocks in a monetary union, and finished by presenting a specific proposal of such a mechanism.

This mechanism would use as indicator of the occurrence of a shock the changes in the unemployment rate of the countries belonging to the union, and would be financed through a fund built from contributions of these countries as a percentage of their tax receipts. The fund would be distributed among the countries affected by a negative country-specific shock according to the proportion in which every one of them would have been affected by the shock. Our proposal was illustrated by means of an empirical application to the case of EMU, and provided a degree of coverage of the shock in line with the figures previously found in the literature for the existing federal fiscal systems.

To summarise, our proposal of mechanism would be a quite simple device, providing a significant coverage to those countries experiencing eventual unfavourable country-specific shocks within a monetary union, which could be used as starting point of a more elaborated policy instrument.

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