Davide Furceri[♦]

Is an Increase of the Fiscal Budget at EMU Level Desirable?

Abstract
The aim of this paper is to investigate how the birth of a central fiscal authority or the creation of a fiscal federalism could improve the action of fiscal policy in terms of redistribution and stabilization in the EMU. In particular, the paper examines what should be the increase of the amount of budget at central level, expressed as percentage quota of GNP of single member Countries, to completely absorb symmetric and asymmetric shocks and shows how redistribution will be affected by this increase.

Keywords: Risk-sharing, Fiscal Policy, EMU
JEL: E63, F42

1. Introduction

The birth of the European Monetary Union (EMU) has determined the creation of a common currency, the Euro, but differently from other monetary unions the EMU have not a central fiscal authority. The role of fiscal policy remains responsibility of the single governments of the EMU member States. Thus, the institutional architecture of Political Economy at EMU level can be seen as a big "giant" of monetary policy, the European Central Bank (ECB), and twelve "dwarfs", represented by the single fiscal governments of the States participating in the Union. This new architecture modifies the assignment of the instruments to the objectives, especially those of stabilization.

[♦] Ph.D. student University of Illinois at Chicago – University of Palermo
Address: 601 S. Morgan Street, Dept. of Economics, Chicago, IL 60607-7121
        Via A. Pacinotti 94 , 90145, Palermo, Italy
Phone: +39-3384238924 / +1-3124045521
Email: dfurceri@yahoo.it

The loss of the sovereignty of monetary policy and the maneuverability of the exchange rate by the single member States has determined the inability to use two important instruments of insurance against risks of shocks. Although the ECB monetary policy could provide insurance against symmetric shocks, single States could face different shocks in sign and dimension.

Moreover, the Treaty of Maastricht and the Stability and Growth Pact (SGP) could limit considerably the room of stabilizing national fiscal policies in some circumstances. As a general rule a deficit superior to the 3% of the Gross Domestic Product (GDP) is considered excessive in the Maastricht Treaty framework and the SGP calls for a medium term of fiscal position for the States participating in the EMU that is close to balance or in surplus. Thus, it is probable that the fiscal policies become more budget sensitive than stabilizing.

Another important issue concerning stabilizing fiscal policies refers to the adequate magnitude of automatic stabilizers to smooth income around the potential level. The wideness of automatic stabilizers will probably diminish with the development of the EMU: tax reforms have generally flattened the tax system by diminishing marginal rates and the increase of the international trade among the member States could decrease domestic stabilizers. In such a context, could be important to investigate if the action of fiscal policy conducted by the single governments is sufficient to insure countries against symmetric and asymmetric shocks. The results in literature point out that a transfer mechanism at central level or an increase of the cooperation among the member States could substantially improve the capacity of the entire union to insure itself against shocks[1].

Another important role of fiscal policy is to provide redistribution among the member States. Redistribution in terms of income transfers from depressed to rich regions could be necessary in order to guarantee a more rapid convergence toward higher living standards and in some cases could compensate individuals living in regions climatically and structurally disadvantaged. In the actual framework, governments provide redistribution only between regions of the same country and in these cases redistribution is not always effective compared to other federations.

The primary objective of this paper is to investigate how the birth of a central fiscal authority or the craeation of a fiscal federalism could improve the action of fiscal policy in terms of the two items discussed above. In particular, our purpose is to quantify the necessary increase by the federal budget (actually only the 1.27% of the Gross National Product of the entire Union) to guarantee full insurance against symmetric and asymmetric shocks and to show how redistribution will be affected by this increase.

---

[1] Furceri D. (2002), Asdrubali P.- Sorensen B.E.- Yosha O.(1996).

The paper is organized as follows. In section 2, we discuss the basic functions of fiscal policy and we investigate the differences between some existing federations.

In section 3, we expose the models to evaluate the necessary EMU budget to absorb shocks and to estimate the redistribution effect.

In section 4, we present the results.

Finally, section 5 concludes with the main outcomes.

2. Fiscal Federalism and the Basic Functions of Fiscal Policy

The three basic functions of fiscal policy are: allocation, redistribution and stabilization.

The allocation function, in principle, can take place both at central and sub-central level. The furniture of public goods, the correction of externalities, the regulation of the market and the assignment of the property rights have in general an impact at micro level and should be ensured by the local governments of the single States and/or of the single regions of the Countries participating in the monetary union. This, however, does not exclude the provision of public goods that have effect on the entire federation and that need governance at central level.

The redistribution function, which is supposed to make for greater equity between states, should be carried out at central level. Oates (1968) argues that the *redistributive* functions of the public sector are not responsibilities of "lower-level" governments, that is, governments that are open with respect to the markets of labor and capital. In presence of increasing factor mobility among the monetary union members, the governments of the single countries should not be considered "central" in the relevant sense. As a consequence, the redistribution policies of member States could be ineffective both at international and intranational level, making necessary a more centralized *redistributive* policy.

The stabilization function should be provided at central level. The principal reason is that otherwise national and regional governments would not have incentive to provide optimal stabilization.

2.1. Fiscal Policy in Existing Monetary Unions

In the existing federations, the three basic functions discussed above are carried out mainly by the central government, although local and state governments could assume a different importance according to the specific cases. The federations that we take in exam are those shown in Table 1.

Australia consists of six states and two territories. It is generally recognized that this country has a very strong interregional equalization system and the table shows that it is more centralized than Canada but less than United States.

Canada is a federation with three levels, 10 provinces and two territories. It is the most decentralized of those considered in table. In fact States and Provinces provide the greatest quota of public expenditures and collect the greatest quota of revenues. It is characterized by a transfer mechanism of horizontal type devoted to obtain redistribution and stabilization.

Finally, U.S. is a federation of fifty states, and is the most centralized one (states and local governments assume little importance compared to the central government). Transfers are mainly of vertical type.

Table1. Expenditure and Revenue by Level of Government (in millions of dollars)

	Expenditure			Revenue		
	Central	States	Local	Central	States	Local
Australia	140.877	94.817	12.846	142.036	96.401	12.572
Canada	186.167	192.979	71.948	188.782	189.007	71.613
U.S.	1,732.56	892.53	746.63	1,805.12	1033.59	768.34

Source: Government Finance Statistics, IMF (2000)

2.2. Fiscal Policy in the EMU

In this section, we consider two main issues. The first refers to the action of fiscal policy conducted by the single States participating in the EMU. In particular, we observe how the set up of the Maastricht Treaty and of the SGP has modified the fiscal stance.

The second concerns the fiscal policy at EU level and we analyze the amount of budget in terms of Gross National Product of the member States, its uses and the implications for a more centralized institution of fiscal policy.

2.2.1. National Fiscal Policies

In 1992, the EMU average debt ratio was greater than the 60 percent of GDP. This ratio increased remarkably until 1997. This increase was caused by the growth of debt of the largest States forming the Union (German, France, Italy, and Spain). From 1997 to 2001 there was a substantial decrease of the average debt ratio principally driven by intermediate (Belgium, Netherlands, Austria) and small States (Greece, Ireland, Luxembourg, Portugal and Finland). This situation is described in Table 2.

Table2. Government debt in the 1990s (change in debt ratios)

	All EMU states	Large EMU countries	Intermediate EMU countries	Small EMU countries
1992-1997	18.8	18.8	4.1	3.3
1997-2001	-12.0	-5.3	-18.2	-19.8

Source: Von Hagen, Brückner (2002)

We can point out two main results. First, the decrease of the average debt ratio after the 1997 was not enough to compensate the initial increase. These data suggest that the political process of fiscal consolidation started after the Maastricht Treaty was not completely successful. Moreover, it was generally argued that a period of consolidation should have been expected in any case to compensate the fiscal expansion during the 70s and the 80s.

Second, the limits imposed by the Maastricht Treaty and by the SGP were more effective and threatening for small and intermediate than for large countries. An example in such a case is represented by the fact that the two largest states participating in the Union (Germany and France) have not respected the constraint relative to the deficit ratio parameter in 2003.

The conclusion driven by the analysis of the table may point out that during the 90s the members Countries have adopted policies aimed to reduce the budget, though not dramatically. However after 1997 (with the exception of 2001) there was a period of substantial growth in Europe. Thus, the debt ratio analysis is not sufficient to affirm if the conduct of the national fiscal policies was aimed to reduce budget or cyclical fluctuations.

Also the results in literature are controversial. For example, von Hagen and Brückner (2002) estimate the policy stance as a measure of contribution of any discretionary policy to observed changes in the surplus ratio and they find that there is tendency for fiscal policy to be pro-cyclical in the EMU. Galí and Perotti (2003) provide contradiction to this result. The authors decompose fiscal policy in "not discretionary" and "discretionary" and they find that discretionary fiscal policy (defined as the value of deficit when the output is at potential level), becomes more counter-cyclical over time following a generalized trend characterizing most of the industrialized countries.

2.2.2. Fiscal Policy at EU Level and Implications

The size of the EU budget is relatively small compared to that of the existing monetary unions. In the 1997 it was about the 1.27 percent of the entire GNP of the member States, and it will be substantially stable until the 2006. This budget is

mainly for interregional *redistributive* and *allocative* functions. Less than half is spent in the European Agricultural Guidance and Guarantee Section (EAGGF), and one third in structural funds and activities. It includes: European Regional Development Fund (ERDF), European Social Funds (ESF) and Financial Instrument for Fisheries Guidance (FIFG). The remaining part is devoted to Internal Policies (research, education, employment etc.), External Actions (development aid, food aid) and Administrative Expenditures (Table 3).

The EU revenues consist principally of four sources: VAT revenues, the GNP resources (obtained as percent quota of GNP of the member States), Custom duties charged on extra EU trade, and Agricultural levies on imports of extra EU Countries.

Table3.EU Spending

	Euro billions	% of the total
EAGGF	38.8	48.1
Structural Funds	28.4	35.2
Internal Policies	4.9	6.1
External Actions	4.3	5.4
Administrative Expenditures	4.2	5.2

Source: European Commission, (1998)

Looking at the trichotomy (allocation, redistribution and stabilization) it seems that the EU spending is aimed to allocative (Common Agricultural Policy) and *redistributive* (ERDF, ESF, EAGFF, FIFG) issues, while there are no fiscal instruments devoted to stabilize income against shocks.

In this context, it is important to evidence how the monetary union could face and absorb symmetric and asymmetric shocks.

The market forces by themselves, the wage flexibility and the labor mobility will hardly fulfill this task[2]. In case of symmetric shocks only the common monetary policy could intervene. Two problems arise with the central monetary policy. The first is that ECB could decide to not intervene or to intervene only moderately if its action interferes with the primary objective of the price stability.

Second, it is generally argued that common monetary policies have regionally differentiated effects[3], thus when the ECB act to smooth aggregate shocks the result could be a situation where shocks persist differentially among the member countries. In this case the coordination of fiscal policies could be necessary.

---

[2] Bayoumi T. - Prasad E (1997), Layard R.- Nickell S.R.- Jackman R. (1991), Vinals J.- Jimeno J. (1996).

[3] Arden S.-Cook S. - Holly S. - Turner P. (2000); Berretta E.-Omiccioli M. - Torrini R (2000); Choi W.G.(1999);Guiso L - Kashyap A.K: - Panetta F.- Terlizzese D.(2000); Meltzer A.H. (1995); Miskin F.S. (1996); Ramaswamy R.- Slot T. (1998)

However, the results in literature show that a policy mix problem arises between the common monetary policy and the decentralized fiscal policies in terms of shocks stabilization. In particular, in case of aggregate shocks, the inefficiency in responding to shocks is increasing in the number of Countries[4].

In presence of asymmetric shocks, stabilization is, in principle, assigned to the single governments. The Maastricht Treaty considers it responsibility of each member States, though limited by the Multilateral Surveillance and by the Excess Deficit Procedure. Moreover, the SGP affirms that each country must satisfy a set of medium-term objectives, including a budgetary position close to balance or in surplus. If the member States maintain their budget balanced in the medium term then automatic stabilizers could be free to operate and large amount of stabilization could be obtained. Estimates of the International Monetary Fund say that single governments could be able to absorb up to 5% of the output gap. However, countries in the EMU with levels of deficit near to the reference value of the 3% could have difficulty to fulfill this task. Data in Table 4 shows the situation regarding this aspect.

Table4.Deficit-GDP, Debt-GDP ratios (2001)

COUNTRY	Deficit/GDP	Debt/GDP
Austria	0.1	61.7
Belgium	0.2	10.57
Finland	4.9	43.6
France	-1.4	57.2
Germany	-2.7	59.8
Greece	0.1	99.7
Ireland	1.7	36.3
Italy	-1.4	109.4
Luxembourg	5.0	5.5
Netherlands	0.2	53.2
Portugal	-2.2	55.6
Spain	-0.3	60.4

Source :IMF, International Financial Statistics Year Book (2002)
Note: "-"means deficit.

What emerges analyzing the table is that the majority of member Countries has balanced budgets with the exception of Portugal, Germany, Italy and France. For these countries, remaining unchanged this scenario, there would be little room for the usual operation of automatic stabilizers and for discretionary fiscal policies to face shocks. By considering the dimension of these countries, it could be a

---

[4] Andersen T.B. (2002).

relevant problem for the stability of the entire Union. For example, pressures could arise in this case toward a more expansive common monetary policy.

In addition, in each member State the wideness of automatic stabilizers will probably diminish with the development of the EMU: the recent tax reforms have generally flattened the tax system by diminishing marginal rates, and the increase of the international trade among member States could decrease domestic stabilizers.

Furthermore, it is important to ask whether member States face trade-off between targeting the budgetary position and stabilizing output and consumption. In principle, these two objectives are inversely related. If a country tends to stabilize output around the potential level it will probably become cyclical sensitive in its budget and vice versa. The empirical evidence concerning this aspect is controversial, as we discussed in the past section.

Under these premises, a greater coordination of fiscal policies among the member countries could be desirable. Andersen (2002) shows that the inefficiency in responding to idiosyncratic shocks decreases when the number of participants increases. However, the EMU institutions do not have the necessary instruments to force the member States to cooperate; they can only provide guidelines concerning the optimal behavior for national fiscal policies. Also the SGP though provides clear and strict guidelines for convergence and stability, it appears a weak instrument of fiscal policy coordination[5].

An increase of fiscal budget of the European Commission, as initially argued by MacDougall (1977) and Delors (1989), could be an important instrument to provide full insurance for the Countries participating in the Union. Moreover, a fiscal mechanism collecting taxes and paying transfers could also increase the redistribution among the member States and set the base for a convergence toward higher living standards.

3. Measuring the BUDGET of Full Risk-sharing

In order to measure the increase of budget that is necessary to achieve full risk-sharing we will go on by steps. First, we describe the model to measure risk-sharing in the current architecture of fiscal policy and in a framework where a transfer mechanism, supported by an increase of the fiscal budget, becomes effective. Second, we introduce the transfer mechanism.

---

[5] Canzoneri M.B. - Cumby R.E. - Dida B.T.(2002);Breuss F. - Weber A.(1999);Von Hagen J – Mundschenk S.(2001).

3.1. Measuring Risk-sharing

We consider N countries. Let $y_{i,t}$ be the time series of GDP for the *i*-th country at time *t*. We decompose the time series of each country using the Hodrick and Prescott procedure in a *growth* and in a *cyclical* component with a smoothing parameter of 40^6. Let us call $g_{i,t}$ the growth and $c_{i,t}$ the cyclical one. If we regress $c_{i,t}$ on a set of explanatory variables such as the lagged values of the dependent variable, we can obtain a measure of risk from the variance of the error term $\varepsilon_{i,t}$ $\left(\sigma_\varepsilon^2\right)$:

$$c_{i,t} = \alpha_i + \sum_j \lambda_j c_{i,t-j} + \varepsilon_{i,t} \qquad j = 1....M , \qquad (1)$$

M is the number of lags considered in the analysis and α_i is the country heterogeneity effect. It is assumed to be uncorrelated with the past values of the cyclical component (Random Effect).

We assume that $\varepsilon_{i,t}$'s are identically and normally distributed with mean equal to zero and variance equal to σ_ε^2; in symbols $\varepsilon_{i,t} \sim_{\text{i.i.d}} N\left(0, \sigma_\varepsilon^2\right)$.

With the lagged dependent variable in equation (1) we have information about the history of the shocks. In this case any impulse in $\varepsilon_{i,t}$ represents the new information available at time *t*. This impulse can be seen as the serially uncorellated shock.

The problem with this model is that complications arise in the estimation. In fact, the lagged dependent variables are correlated with the compound disturbance, since the same α_i enters the equation for every observation in group *i*. This implies that the OLS estimates are inconsistent. Thus, it is necessary another technique to estimate the model. The technique used in this paper is that proposed by Arellano and Bond (1991) with a number of lags (*M*) equal to three. Then, we use the residuals of this regression to compute an estimate of σ_ε^2.

Given the fact that the Arellano and Bond estimator is consistent, an unbiased[7] estimator of σ_ε^2 is provided by:

$$s^2 = \frac{\displaystyle\sum_i^N \sum_t^T (e_{i,t} - \bar{e}_i)^2}{NT - N - M - 1}$$

---

[6] For the reason to choose $\lambda = 40$ see Appendix A.
[7] Maddala G. (1971)

Successively, in order to quantify the grade of risk-sharing we decompose the Gross Domestic Product in different national aggregates (Sorensen and Yosha, Furceri), all closely tied to the GDP: Gross National Product (GNP), National Income (NI), Disposable National Income (DNI) and Total Consumption (C). Each one of these terms differs in elements that can provide risk-sharing in the following phases of decomposition:

GDP-GNP = *international net transfers of factor income* (2)

GNP-NI = *capital depreciation*

NI-DNI = *international net transfers* (transfers less the payment of taxes)

DNI-C = *total saving*

To measure the amount of variance reduction of the cyclical component of the original series we use the regression in (1) for each one of the four types of income. Clearly, the cumulate variance reduction (or increase, in case of pro-cyclical factors) is imputable to the differential term in each equation in (2). Particularly important for our analysis is the *third* term. In fact, it measures the amount of risk-sharing by the budget factor.

Once obtained the result of the regressions, we repeat the analysis by adjusting the measure of disposable national income by adding transfers and by subtracting tax payments coming from the transfer mechanism discussed in the next section. By using this procedure, we can observe how the amount of risk-sharing obtained by the fiscal central budget changes by varying the marginal tax rate. Thus, we can inspect the amount of budget at EMU level (as a quota of GNP of member States) able to fully face asymmetric and symmetric shocks.

3.1.1 The Transfer Mechanism

A scheme of fiscal transfers to absorb asymmetric and symmetric shocks will be probably desirable in the EMU, given that it is characterized by constrained national fiscal policies, wage rigidity and low labor mobility.

This scheme should serve mainly as a compensatory mechanism for the cyclical national income and should be financed by the Central Budget at EMU level. A mechanism based on smoothing cyclical fluctuations of the GDP of the member States has the characteristic of being close to the fiscal mechanisms in the existing Unions, where part of the contribution of the member Countries is proportional to the GNP. Other variables taken into account to provide insurance, such as the

unemployment rate, could have some disadvantages. In fact, a typical problem with this variable is the slow process of adjustment due to factors as *labor-hoarding*, thus the transfers could be pro-cyclical instead of counter-cyclical.

In principle, it is possible to list the characteristics that an ideal scheme of transfer should have. Following the approach of Hammond and Von Hagen (1995) is possible to list seven optimal issues concerning the ideal mechanism.

- The mechanism should be s*imple and automatic*. Simplicity appeals to obtain a more widespread knowledge among citizens and a greater consensus that is a key element for the creation of a similar institution. Automaticity should avoid or at least limit strategic and discretional behaviors.
- *Transfers should be zero on average for long periods*. They should be used only in order to provide insurance against temporary shocks or, when permanent, should be used only temporarily. A country in a situation of full recession should act itself through factor mobility to obtain the adjustment. Moreover, serious political problem could arise in a situation in which high and permanent regional or national transfers go only in one direction.
- *Transfers should be function of serially uncorrelated shocks*. This should avoid moral hazard problems that in general become relevant in presence of a transfer mechanism. Moreover, this criterion does not rule out incentives for individual countries to adopt active policies to absorb shocks.
- *The transfer mechanism should be not regressive.* This implies that the transfers should be not paid for small level of income but only in situations of shocks, otherwise only smaller countries would have advantages from this type of mechanism.
- *The scheme should be able to offset fully shocks.* If not, the implementation cost of the mechanism could overcome the benefits.
- *The scheme should be generally accepted* from current and news countries forming the Union.

Even if these characteristics can serve as practical guidelines in the set-up of a transfer mechanism, they cannot be satisfied simultaneously. A mechanism related to serially uncorrelated shocks with zero conditional expectation, in principle, requires techniques that are complex and difficulty understandable by citizens of the Union. On the converse, more simply techniques in the determination of shocks and transfers could generate *redistributive* instead of

stabilizing effects among the member States. Thus, a sort of trade-off should be considered. The our assumptions are that the transfer mechanism aims to smooth *only the cyclical component of GDP around the potential level,* that the *shocks are serially uncorrelated,* that the *transfer mechanism is not regressive* and that it *is automatic.*

The scheme that we propose collects taxes as a quota of the GNP of the member States, and pay transfers to the countries negatively hit by shocks.

$$EMU\_budget_t = \sum_i \tau \cdot GNP_{i,t} \, ,$$

where "τ" is the marginal tax rate.

The transfers are given by the following rule:

$$T_{i,t} = 0 \qquad \text{if } \varepsilon_{i,t} \geq 0 \text{ or } \qquad \frac{GDP_{i,t} - GDP_{i,t-1}}{GDP_{i,t-1}} \leq -2\%$$

$$T_{i,t} = \frac{\varepsilon_{i,t} \sum_i \tau \cdot GNP_{i,t}}{\sum_i \varepsilon_{i,t} | \varepsilon_{i,t} < 0} \frac{n(s)_t}{n_t} \frac{DNI_{i,t}}{DNI_t} \quad \text{if } \varepsilon_{i,t} < 0 \text{ and } -2\% < \frac{GDP_{i,t} - GDP_{i,t-1}}{GDP_{i,t-1}} < 0 \, ,$$

where $\varepsilon_{i,t}$'s are the shocks for the country "*i*" at time "*t*", and are derived in appendix A. *n(s)* indicates the numbers of countries where the negative shocks occur, DNI_i the disposable national income of Country "i" , and *DNI* that of the Entire Union.

The transfers are function of three elements: the relative importance of the shock for the country "*i*" compared to those of the other countries ($\varepsilon_{i,t} / \sum_i \varepsilon_{i,t} | \varepsilon_{i,t} < 0$),

the quota of the number of countries hit by negative shocks ($n(s)_t / n_t$) and the relative dimension of the country in terms of DNI ($DNI_{i,t} / DNI_t$).

The first element allows to distribute public resources in a way that the countries with larger shocks will receive larger transfers.

The second element takes into account the symmetry of the shocks. In this way it is possible to depurate transfers from the symmetry-effect. The countries will receive a given amount of transfers that does not depend on the degree of symmetry.

The third element allows to generate transfers commeasured to the dimension of the country.

The mechanism will not pay a country that has a decrease of the Gross Domestic Product greater than 2%, because this is an exceptional circumstance that allows the country to overcome the reference value of 3% of the Maastricht Treaty.

Finally, we impose the condition of balanced budget at EMU level for each year:

$$\sum_i T_{i,t} + A_t = EMU\_budget_t + R_t$$

where the A_t are the expenditures in EAGGF, Structural Funds, Internal Policies, External Actions, Administrative Expenditures, and R_t are: VAT revenue, Custom duties charged on extra EMU trade, and Agricultural levies on imports of extra EMU Countries.

To conclude, it is important to underline that this mechanism is able to manage both asymmetric and symmetric idiosyncratic shocks.

3.2 Redistribution

Although the transfer mechanism that we propose has the purpose to smooth asymmetric and symmetric shocks, it is interesting to investigate the effects of these transfers in terms of redistribution among the member countries.

The redistribution function in a federation is devoted to make for greater equity among the states participating in the federation.

International transfers affect and modify the value of Disposable Income for each member country. Then, a way to measure international redistribution could be obtained by using the following regression:

$$Y_i^* - Y^* = \alpha + \beta(Y_i - Y) + \varepsilon_i \tag{3}$$

Where Y_i^* and Y_i represent, respectively, the DNI after and pre taxes and transfers. The terms without subscripts indicate average values.

We averaged the data over a long period of time in order to eliminate (or at least to reduce) the incidence of cyclical factors. $1-\beta$ will measure the ability of the transfer mechanism to reduce disposable national income dispersion around its mean. In fact, if $\beta = 1$ the deviations from the mean of the pre tax and transfer income are perfectly reflected into the deviations of the after tax and transfers

income. In other words there is no redistribution. Smaller is the value of β, greater is the *redistributive* effect of the mechanism.

4. Results

We begin by analyzing the results in terms of risk-sharing in the current institutional architecture of fiscal policy in the EMU. Table 5 shows the variance of the cyclical component for each of the aggregates in which the GDP was decomposed.
Table 6 explains the amount of shock that is absorbed by the factors in (2).

Table5-variance reduction in the cyclical component

Gross Domestic Product	107.01
Gross National Income	104.16
National Income	74.63
Disposable National Income	70.02
Consumption	67.09

By analyzing Table 6 we can see that in the estimated model a remarkable share of shock that hit the EMU countries is not absorbed. The estimate of not smoothed shock is 62.7 %, underling the fact that the factors in (2) do not operate adequately.
This result is confirmed by a previous work of the author. Furceri (2002), by using the decomposition model proposed by Asrubali, Sorensen and Yosha (1996), found that the percentage of shock that is not absorbed in the current framework varies between the 50.7 and 72.5%.
The only aggregate that provides a consistent amount of risk-sharing is the capital depreciation. In fact, the capital depreciation is typically counter-cyclical.
We repeat the estimation of the model in (1) taking into account the net transfers generated by the transfer mechanism discussed in section 3. We found different

grades of risk-sharing as we vary the marginal tax rate τ, and we found that the *optimal*[8] τ is the 9%. Table 7 shows the results for some marginal tax rates.

Table6- variance reduction (%)

Net International Transfers of Factors Income	2.66
Capital Depreciation	27.6
International Net Transfers (transfers less payment of taxes)	4.31
Total Saving	2.74
Not Smoothed	62.7

Table7- % of not smoothed shock with different τ

% not smoothed	$\tau = 0$ %	$\tau = 8$ %	$\tau = 9$ %	$\tau = 10$ %
shock	62.7	23.7	11.6	17.8

In Table 8, we report the variance reduction in the new fiscal architecture in correspondence of the optimal τ.

Table8- variance reduction (%)

Net International Transfers of Factors Income	2.66
Capital Depreciation	27.6
International Net Transfers (transfers less payment of taxes)	55.4
Total Saving	2.74
Not Smoothed	11.6

---

[8] The marginal rate generating the greatest variance reduction in the cyclical component

The results strongly support the hypothesis that a new institutional architecture of fiscal policy, with a transfer mechanism supported by an increase of the amount of budget (9% of GNP of the entire union), is remarkably effective. We assumed that the only factor that is changed is the Disposable National Income. In practice, we have modified DNI by the transfers and by the contribution in terms of GNP to the EMU budget. Thus, the first two factors and the associated degree of risk-sharing are unchanged.

We assumed also that the consumption smoothing is the same. This is because we have no data for the new consumption deriving from the new DNI. Another way to proceed could be to assume that the economy does not change the quota of DNI allocated to consumption. Results in literature assuming this restriction show that the consumption smoothing remains almost unchanged[9].

The international net transfers, now, play a key role in absorbing exogenous shocks; in fact by themselves they smooth the 55.4% of the shock.

The quota of shock that is not absorbed is only the 11.6%. In principle, this amount is thin enough to be absorbed by the market forces (labor mobility and wage flexibility).

By observing the results concerning the two frameworks considered in the analysis, it emerges that the institution of a fiscal federalism can significantly help the EMU member countries to face both symmetric and asymmetric shocks (Fig.1-5).

Finally, we use the new values of DNI to measure redistribution. By estimating model (3), we found that the amount of redistribution resulting from the transfer mechanism is $1-\beta = 18\%$.

This value is low if compared to the other results in litarure[10] but it is not surprising. In fact we must remember that this mechanism was uniquely designed to absorb shocks. Probably, by imposing different (less) restrictions in the determination of the shocks and of the transfers we will obtain greater redistribution and smaller stabilization effects. Finally, it is important to remark that the analysis has also an irresolvable weakness. In fact, the analysis conducted in the second scheme is the typical ground for the application of the Lucas critique. The new (different) institutional framework could alter the economic system, providing no robustness for our result. If this will happen is not certain. In any case, we believe that the analysis represents still a functional tool to compare the two institutional architectures and provide useful indications of political economy.

---

[9] Furceri D. (2002)
[10] Sachs J. – Sala-I-Matin X. (1991)

Fig-1.Variance reduction in the two frameworks.
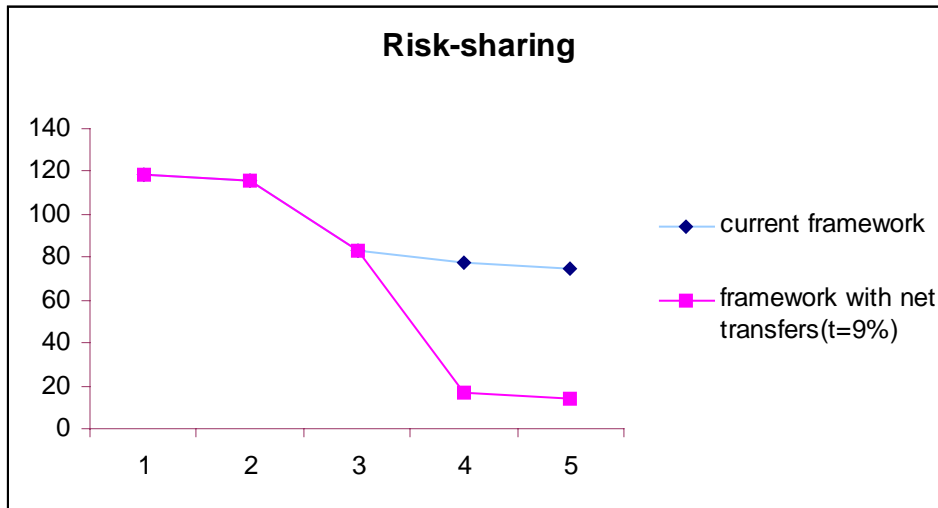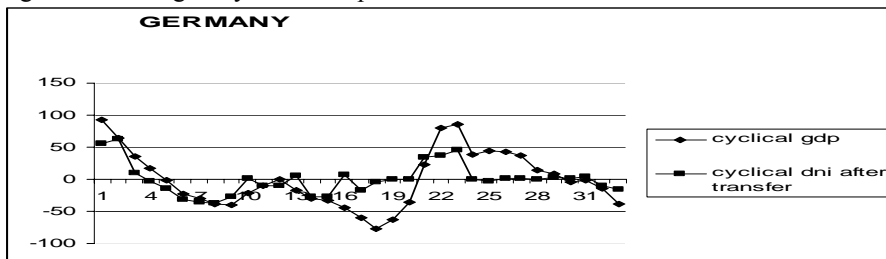

Fig-2. Smoothing of cyclical component.
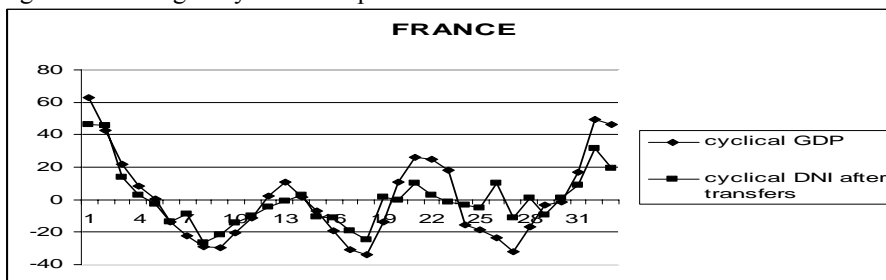

Fig-3. Smoothing of cyclical component

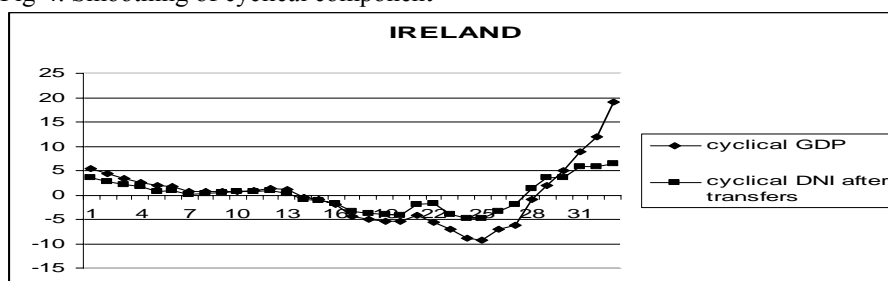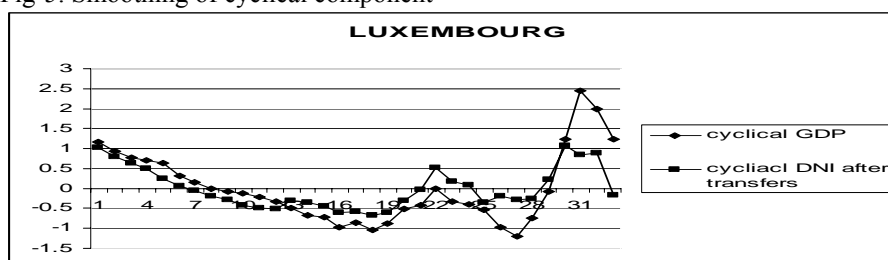Fig-4. Smoothing of cyclical component

Fig-5. Smoothing of cyclical component

5. Conclusions

The three basic functions of fiscal policy are: allocation, redistribution and stabilization. In most of the existing monetary unions, these three functions are carried out mainly by the central governments.

In the EMU, with no central fiscal authority, the entire budget is administered to *allocative* and (partially) to *redistributive* purposes. The main problem with this framework of Political Economy is the inability of the economic system to manage symmetric and asymmetric shocks, i.e. to conduct effective stabilization policies.

In a situation of symmetric shocks, the only instrument that could provide insurance is the common monetary policy. However, although the ECB could act to smooth aggregate shocks, the different transmission mechanisms among the EMU member States will likely produce a situation where shocks persist differentially. Thus, stabilization is mainly assigned to the fiscal policy of the single member States.

If they maintain their budget balanced in the medium term then automatic stabilizers could fulfill this task. However, the data on deficit-GDP ratio show that

the reference value of the 3% represents a serious limit for the largest countries, determining little room for stabilizing fiscal policies. Moreover, the wideness of the automatic stabilizers will probably diminish in the following years in the entire union.

The results of this paper confirm these findings. In fact, they show that in the current framework, after a shock, the amount of it that is not smoothed is the 62.7% and that the only factor that provides risk-sharing is the capital depreciation. These results reflect, on one side the constraints of the Maastricht Treaty and of the SGP and on the other side, the low mobility of labor and the high wage rigidity characterizing the economies of the EMU countries.

In this situation the creation of a central fiscal authority or of a transfer mechanism, supported by an increase of the fiscal budget of the EMU, could be necessary. In particular, we found that, in presence of a transfer mechanism, an increase of the amount of budget at central level up to the 9% of the GNP of the entire union is able to face asymmetric and symmetric shocks.

Another appealing feature of this mechanism is that, although it was not designed to *redistributive* purposes, it helps to reduce up to 18% of DNI inequalities among the member countries.

Appendix A

Following Hodrick and Prescott (1997) we decompose the GDP time series y_t in two terms, the cyclical component c_t and growth component g_t

$$y_t = g_t + c_t \qquad\qquad\qquad \text{for } t=1.......T$$

The c_t are the deviations of y_t from g_t and are assumed equal to zero over a long period of time.

The c_t are calculated using the Hodrick-Prescott filter with a parameter of smoothness equal to 40. The criterion of choosing λ (the smoothness parameter) equal to 40, is to determine a cyclical component that varies moderately (less that 2%). For example, in correspondence of this value, Hodrick and Prescott have found that the standard deviation of the cyclical component of U.S. GNP is only the 1.56%. By this way, we stabilize only moderate shocks.
Greater shocks ($\geq$ 2%) permit to single member States to overcome the limit on the 3% on the ratio Deficit/GDP.

In order to guarantee that the components that we have found are serially uncorrelated we regress c_t for each i against its lagged terms. We use three periods as delay.

$$c_t = \alpha + \beta c_{t-1} + \gamma c_{t-2} + \delta c_{t-3} + \zeta_t$$

Where ζ_t is the error tem distributed as a White Noise

The residual from this regression ε_t are transitory and not significantly serially correlated.

Bibliography

ANDERSEN T. R., «Fiscal Policy Stabilization in a Monetary Union with Inflation Targeting », *CEPR Discussion Papers,* n. 3232, 2002.

ARDEN R.- COOK S.- HOLLY S. - TURNER P., «The Asymmetric Effects of Monetary Policy: Some Results from a Macroeconometric Model», *The Manchester School,* vol. 68, n. 4, 2000, pp. 419-441.

ARELLANO M.- BOND S., «Some Tests of Specification for Panel data: Monte Carlo Evidence and an Application to Employment Equations», *Review of Economic Studies,* vol. 58, 1991, pp. 277-297.

ASDRUBALI P. - SORENSEN B.E. - YOSHA O., «Channels of Interstate Risk-sharing: US 1963-1990», *The Quarterly Journal of Economics,* vol.144, 1996, pp. 108181-1110.

BAYOUMI T. - PRASAD E., «Currency Unions, Economic Fluctuatios, and Adjustement: Some New Empirical Evidence», *IMF Staff Papers,* vol. 44, n. 1, 1997, pp. 36-57.

BERRETTA E. - OMICCIOLI M. - TORRINI R., «Segmentazione Territoriale dei Mercati Bancari e Trasmissione degli Shock Economici Attraverso il Canale Creditizio», *Politica Economica*, 2000, pp. 1-25.

BREUSS F. - WEBER A., «Economic Policy Coordination in The EMU: Implications for The Stability and Growth Pact?», *EUI Working Papers,* n. 26 , 1999.

CANZONERI M.B. - CUMBY R.E. - DIDA B.T., «The Need for International Policy Coordination: What's Old, What's New, What's Yet to Come?», *NBER Working Paper*, n. 8765, 2002.

CHOI W.G., «Asymmetric Monetary Effects on Interest Rates Across Monetary Policy Stances», *Journal of Money, Credit, and Banking,* vol. 31, n. 3, 1999, pp. 386-416.

CRUCINI M.J. - HESS G.D., «International and Intranational Risk Sharing», in HESS G.D.- VAN WINCOOP E. (eds.), *Intranational Macroeconomics*, Cambridge University Press, 2000, pp. 37-59.

FATÀS A., «EMU: Countries or Regions? Lessons from The EMS Experience», *CEPR Discussion Papers,* n. 1558, 1997.

FURCERI D., «Risk-sharing and Institutional Architecture of Stabilization Policies in the EMU: Methodological Aspects and Empirical Evidence», *Rivista di Politca Economica,* Nov-Dec, 2002.

GALÍ J. – PEROTTI R., «Fiscal Policy and Monetary Integration in Europe», *CEPR Discussion Papers,* n. 3933, 2003.

GUISO L. - KASHYAP A. K. - PANETTA F. - TERLIZZESE D., «Will A Common European Monetary Policy Have Asymmetric Effects?», *Economic Perspectives of Federal Reserve Bank of Chicago*, 2000, pp. 56-75.

HAMMOND J. - VON HAGEN J., «Regional Insurance Against Asymmetric Shocks: An Empirical Study for The European Community» , *The Manchester School,* vol. 66, n. 3, 1995, pp. 331-353.

LAYARD R. - NICKELL S. - JACKMAN R., *«Unemployment, Macroeconomic Performance and the Labour Market* », Oxford, Oxford Economic Press, 1991.

MADDALA G. , «The use of Variance Components Model in pooling Cross Section and Time Series Data *»,Economometrica,*n.39,1971,pp.341-358.

MELITZ J. - ZUMER F., «Regional Redistribution and Stabilization by The Central Governement in Canada, France, The UK and The US: A Reassessment and New Tests», London, *CEPR Discussion Paper*, n. 1829, 2000.

MELTZER A.H., «Monetary, Credit Trasmission Process: A Monetarist Perspective», *Journal of Economic Perspectives,* vol. 9, 1995, pp. 49-72.

MISHKIN F.S., «The Channel of Trasmission: Lessons for Monetary Policy », Cambridge, *NBER Working Paper,* n. 5644, 1996.

OATES W., «The Theory of Public Finance in Federal System», *Canadian Journal of Economics,* n.1, pp.37-54.

RAMASWAMI R. - SLOK T., «The Real Effects of Monetary Policy in The European Union: What Are The Difference?», *IMF Staff Papers,* vol. 45, n. 2, 1998, pp. 374 -396.

SACHS J. - SALA-I-MARTIN X., «Fiscal Federalism and Optimum Currency Areas: Evidence for Europe from The US», Cambridge, *NBER Working Paper,* n. 3885, 1991.

SORENSEN B. E. - YOSHA O., «International Risk-sharing and European Monetary Unification», *Journal of International Economics,* vol. 45, 1998, pp. 211-238.

VAN WINCOOP E., «Regional Risksharing», *European Economic Review*, vol. 37, 1995, pp. 1545-1567.

VINALS J. - JIMENO J., «Monetary Union and European Unemployment», London, *CEPR Discussion Paper*, n. 1485, 1996.

VON HAGEN J., «Fiscal Policy and Intranational Risksharing», *CEPR Discussion Paper*, 1998, pp. 1-26.

VON HAGEN J. BRÜCKNER M. , «Monetary and Fiscal Policy in The European Monetary Union»,*Monetary and Economic Studies (Special Edition)*, December 2002.

VON HAGEN J. - MUNDSCHENK S., «The Functionning of Economic Policy Coordination», *ZEI Working Paper,* B 08, 2001.