Monetary Unions, Adjustment Mechanisms and Risk-Sharing: Can Market Forces Replace Fiscal Policy in the European Union?

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A b s t r a c t

We study the issue if fiscal policies are needed to support a single currency in a monetary union or that the regime itself promotes the smoothing of asymmetric shocks through market forces. The issue is discussed from the point of view of economic efficiency. We find that in a world of complete markets and identical probability beliefs over the states of nature across agents, all risk-sharing will be provided by capital markets and fiscal transfers of income across regions, other than those for distribution of wealth, are not required. In the presence of incomplete markets consumption cannot be smoothed by capital markets alone; here, equilibrium allocations need not be Pareto-optimal due to inability of market participants to transfer incomes across all states of nature; hence, risk-sharing will be incomplete, and fiscal transfers of income across regions are needed. Even constrained Pareto-efficiency may require government intervention.

1. Introduction

The discussion on the theory of monetary unions has centered so far on the determination of conditions for optimality of a currency area from the point of view of a single country, and of a given membership, respective (see, for example, Melitz 1995, 1996; Demopoulos and Yannacopoulos, 1999). Both approaches abstract from policy aspects.[1]

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Recent contributions to the debate over monetary unions have cast the argument of transferring funds from region to region in terms of regional insurance against asymmetric shocks (Asdrubali, Sorensen and Yosha, 1966; Sorensen and Yosha, 1998; Melitz and Zumer, 1999; von Hagen, 1998; Kletzer and von Hagen, 2000). A number of authors, as von Hagen, have argued that the EMU should be vested with a fiscal system providing automatic transfers of funds from region to region. According to this literature the feasibility of a monetary union hinges on establishing a federal fiscal system. Others, as Melitz and Zumer, have argued that the members of a monetary union can share risk via cross-ownership of productive assets, and they may smooth their consumption by adjusting the composition of their asset portfolios in response to asymmetric shocks; they conclude that the sacrifice of monetary independence by the members of a monetary union reduces their ability to absorb asymmetric shocks via monetary policy, but the regime itself promotes the smoothing of shocks through market forces. We interpret this to mean that no fiscal policies are needed to support a single currency in a monetary union. In other words, capital markets (free capital mobility) may do the job of channeling funds from regions in prosperity to regions in distress. (see, Section 2).

The issue therefore is whether capital markets (free capital mobility) can replace fiscal policy in a monetary union.

The purpose of this theoretical paper is to discuss this issue from the point of view of economic efficiency. Of course, if capital mobility could accomplish a Pareto-efficient allocation of risk among economic agents and complete risk sharing within a monetary union, then fiscal intervention would be redundant. Indeed, Pareto-efficiency depends on the degree of completeness of capital markets. If capital markets are complete, then one may expect that financial integration could lead to a Pareto-efficient situation. However, it is known from economic theory that the existence of asymmetric information and transaction costs renters capital markets incomplete leading thus to Pareto-inefficient situations. Even constrained equilibria in incomplete markets are generally inefficient (Geanakoplos and Polemarchakis, 1986). Therefore, to move towards constrained Pareto-efficiency may require active government interventions. The importance of the completeness of capital markets as a criterion for government interventions in mentioned by von

Hagen (1998) and von Hagen and Hepp (2000); however, they do not relate it to economic efficiency. This point is emphasized here.

The paper is organized as follows: In Section 2, we discuss the mechanisms for the smoothing of asymmetric shocks proposed by the conventional OCA theory and more recent contributions to the debate. In Section 3, we discuss the conditions under which complete risk-sharing can occur and we argue that markets forces may replace fiscal policy in the context of a monetary union only in a regime of complete markets. In Section 4, we argue that capital markets are not constrained Pareto-efficient (Geanakoplos and Polemarchakis, 1986), and therefore they cannot be relied upon for the efficient allocation of risk. In the final section, we summarize our conclusions.

2.   The smoothing of asymmetric shocks in a monetary union

2.1   *The conventional theory*

A monetary union implies the loss of exchange rate as an instrument of economic policy. Since in the classical economic analysis the purpose of letting the exchange rate to fluctuate is to act as an asymmetric shock absorber, the sacrifice of the exchange rate as a policy instrument poses the following questions (Artis 1994; Melitz, 1995, 1996): (i) How likely are asymmetric shocks to occur? Does increasing integration make them less likely? (ii) Are there alternative asymmetric shocks absorbers?

An answer to the first question is important because asymmetric shock absorbers are needed only if there are asymmetric shocks. According to the received theory, the source of asymmetric shocks is to be found in the difference of economic structure of the member countries. Differences in economic structure refer to differences in tastes, technology and factor endowments, that lead to the specialization of the economies of the members, according to the principle of comparative advantage. The second part of the first question (i.e., whether increasing integration makes asymmetric shocks less likely) is a hotly debate issue. Krugman (1991) argued that integration renders the member countries less

similar and therefore less suitable to form an optimum currency area, implying that asymmetric shocks do not become less likely by higher integration. The European Commission (1990) has expressed the opposite view. Demopoulos and Yannacopoulos (2000) argued that higher integration and increased structural similarity are positively correlated in cases where the Ethier's complementarity theorem holds (Ethier, 1982). Assuming therefore that the member countries are structurally dissimilar, and that higher integration does not make asymmetric shocks less likely, the second question (concerning the alternative asymmetric shock absorbers) becomes relevant.

Conventional OCA theory suggests the mechanisms of factor mobility, wage and price flexibility, and fiscal policy for absorbing asymmetric shocks. Factor mobility and free trade as preconditions for the adoption of a common currency were emphasized by Lerner (1944). Mundel (1961) argued that only regions with high labour mobility should adopt a common currency. His argument runs as follows: Assume two regions called H and F, each specializing in the production of one good (h and f, respectively). These regions are populated by people who consume both goods so that there is an interregional trade. Suppose further that starting from full employment equilibrium output, there is a permanent shift of preferences from good h to good f. If the relative prices do not change (if the real exchange rate remains unchanged), there will be a trade deficit for H, and a trade surplus for F. Equilibrium can be restored at the initial relative prices (at the initial real exchange rate) by moving labour from H to F.

Another way to restore equilibrium is by changing relative prices and wages but not the nominal exchange rate. In the previous example, prices and wages in H have to fall (and in F have to rise). If relative prices and wages adjust immediately, the real exchange rate moves to the new equilibrium level, and therefore the equilibrium is restored.

The third channel of adjustment is providing by fiscal policy. If prices and wages are fixed or their speed of adjustment is low, and labour mobility is also low or non-existent, then asymmetric shocks can be absorbed through fiscal policy. The importance of fiscal policy for a monetary union was emphasized by the McDougal Report (1977), the Delors Report (1989), and eminent economists like

Goodhart (1995) and others, who argued that EMU needs fiscal policy to deal with asymmetric shocks.

2.2 *Recent contributions*

More recent contributions to the debate over the EMU have cast the argument of channeling funds from region to region in terms of regional insurance against asymmetric shocks. A number of authors, see for example, von Hagen (2000), have argued that the EMU should be vested with a fiscal system providing automatic transfers from region to region. Fiscal policies may aim to offset the effects of asymmetric shocks on regional employment or consumption.

These views on the importance of fiscal policy in the context of a monetary union, are not endorsed by all economists. Diba (1992), in discussing the well known paper by Sala-i-Martin and Sachs (1992), stated that he was *"not convinced that the feasibility of the EMU hinges on establishing a federal fiscal system"*. Similarviews have been expressed by Giovannini (1992). To these views we should add an earlier contribution by Melitz and Vori (1992), where they argue against any federal insurance scheme, given those available in the European Union, since the likelihood of asymmetric shocks and the benefits accruing from a federal insurance scheme are too small. Therefore, no fiscal policies are needed to support a single currency. They argue that integrated financial markets would provide the appropriate mechanisms.

In a more recent contribution, Sorensen and Yosha (1998) accept the same line of reasoning although they believe (as far as the EU is concerned) that until the capital markets are sufficiently integrated to carry out this role, as they do in the United States, the member countries of the European Union have to provide greater insurance through their budgets. Melitz and Zumer (1999) observe that EMU lacks of a fiscal mechanism providing automatic transfers from regions enjoying relative prosperity to those in distress. Nonetheless, the members of a monetary union can share risk via cross-ownership of productive assets, and they may smooth their consumption by adjusting the composition of their asset portfolios in response to asymmetric shocks. They conclude that the sacrifice of monetary independence by the members of a monetary union reduces their ability

to absorb asymmetric shocks via monetary policy, but the regime itself increases smoothing of the shocks through market forces (private capital mobility).[2]

The question therefore is if market forces (private capital mobility) can replace fiscal policy in a monetary union. Or, casting the argument in terms of regional insurance against asymmetric shocks, the problem boils down on whether the citizens of the member countries can diversify their risks, so that their consumption patterns are non-stochastic. The conditions under which this could be occurred via financial markets are discussed in the next section.

3. Conditions under which complete risk sharing can occur: theoretical considerations

This question could be answered in the context of a multiperiod economy consisting of L commodities (L=1,2,…,ℓ), H economic agents (H=1,2,..,h) and S states of nature (S=1,2,…,s). The concept of the state of nature is to be understood as a complete description of a possible outcome of *uncertainty*. The meaning of uncertainty is that economic agents do not know the state of nature that will be revealed, although they may have a subjective *probability* of it. Furthermore, it is assumed that information is symmetric across all states of nature, i.e., all agents are able to recognize the occurrence of s. In the context of a monetary union, a state of nature may refer to a future asymmetric shock, as for example, changes in tastes, technologies, etc.

Second, we postulate a system of *sequential* markets, that is a system of reopening spot markets. These spot markets are connected by a system of financial markets. It is assumed that these financial markets are complete, in the sense that there are sufficiently many financial markets so that agents can transfer income across all spot markets without restrictions (i.e., it is assumed that there are no information or physical transaction costs that limit these transfers across spot markets).

More formally, assume that there are,

$$J = LS$$

financial markets, each of which is designed for the delivery of a particular good $\ell \in L$, contingent on a particular state of nature $s \in S$. All these financial markets exist and are ***complete***. Then, it is shown (Arrow, 1953) that the equilibrium allocations of the sequential model coincide with those of the contingent contract model (Arrow-Debreu model), meaning that all trading opportunities are exhausted at the first day and no markets need to reopen later on.

Now, the view that the EMU will promote consumption smoothing via private capital mobility, and that no fiscal intervention in required presupposes the existence of the following two requirements: *First*, capital markets are ***efficient*** (in promoting consumption smoothing) in the sense that all agents cannot simultaneously improve their welfare. This means that the marginal rates of substitutions in consumption across all states of nature are the same in all of them. *Second*, risk sharing is ***complete***. Risk-sharing is complete if agents can transfer wealth across all states of nature so that their consumption levels are identical in all of them.

In the context of the Arrow-Debreu model these two requirements will be met if the following conditions are satisfied:
  (i)   All agents have the same probability beliefs over the states of nature, and
  (ii) Markets are complete in the sense that there is a market for every future event.

The view that consumption smoothing can be achieved via capital mobility alone is valid if conditions (i)-(ii) are satisfied simultaneously (provided that there is no aggregate risk). If one of these conditions is not satisfied, then this view will not be valid. In fact, if we assume complete markets but unequal probability beliefs (i.e., condition (i) does not hold), the allocation of risk is still optimal (Pareto-efficient) but consumption levels in the different states of nature will be different (risk-sharing will not be complete). In this case, the consumption of each representative consumer is higher in the state of nature he thinks comparatively more likely relative to the beliefs of the other representative consumers.

By exploiting the second theorem of welfare economics, we can state that any Pareto-efficient risk allocation can be achieved by setting up complete contingent markets (with the appropriate distribution of wealth) and having them reach

equilibrium. The view that financial markets will promote efficient allocation of risk is, theoretically, supported by this theorem. However, an optimum allocation of risk without the appropriate distribution of wealth may benefit the rich but not the poor who do not hold a well-diversified portfolio of assets (De Grauwe, 2001). It may be concluded, therefore, that even in perfect markets, lump-sum transfers (implemented by fiscal policy) are needed for equity considerations.

There are, however, many reasons to believe that markets are incomplete (i.e., condition (ii) is violated), which means that the second theorem of welfare economics does not hold. The reasons are the following:

(i)   Some agents concerned with markets at future dates are unable to trade today (Dreze, 1991). This applies particularly to labour markets. In fact, asset holders can diversify risks through stock markets. This is not the case for wage earners.

(ii)   *Assymetric information*. The characteristics of all goods are not observable by all agents, and,

(iii)   *Transaction costs* limit the ability of agents to use asset markets to self insure against asymmetric shocks (Heaton and Lucas, 1996; Hammond, 1998).

Within the context of our sequential model this means that the existence of asymmetric information and transaction costs limit the ability of agents to transfer wealth across all spot markets. In other words, financial markets are incomplete (Radner, 1972). If the possibility of transferring assets across states of nature is limited, there may be a welfare loss due to the inability of economic agents to diversify risks to the extend that it would be required. This implies that individuals have to save more in order to insure themselves against the randomness of their consumption streams.

One may conclude therefore that in incomplete markets an equilibrium allocation need not be Pareto-optimal due to the inability of market participants to transfer incomes across all states of nature. This means that the marginal rates of substitution in consumption are not equalized across all states of nature.

4.   Constrained Pareto Optimal

If allocations are not Pareto-optimum, then can be improved by government intervention. It was argued, however, (Geanakoplos and Polemarchakis, 1986, Stiglitz 1987), that in incomplete markets the authority faces the same constraints (created by asymmetric information and transaction costs) as the market participants do. Therefore, a new concept of Pareto-optimality is needed which is appropriate for this situation. This is the concept of *constrained Pareto-optimality*. In order to define this concept, it is necessary to introduce the concept of constrained feasible allocation. A *constrained feasible allocation* is an allocation which is obtained in an incomplete system (i.e., an allocation which is achieved after allowing for the asymmetric information and transaction costs which prevent markets from being complete). A constrained feasible allocation is *constrained Pareto-optimal* if there is no other constrained feasible allocation which is superior to it. We may extend this definition to *financial markets*. A financial market is constrained Pareto-efficient if no planner (who is constrained to use the same incomplete system of markets) could make every consumer better off.

We can now modify our criterion concerning *fiscal intervention* as follows: The view that a monetary union will promote consumption smoothing via financial markets, and that no fiscal intervention is required, is justified when allocations in incomplete markets are *constrained Pareto-optimal*.

The question is then whether allocations in incomplete markets are constrained Pareto-efficient. It can be shown that in an economy (a monetary union) with only one consumption good in the second period and no assets, any equilibrium is a constrained Pareto-optimum. It is a constrained Pareto-optimum because when there is only one good at each date, there are no relative prices at the second date. There is thus a unique relationship between first period decisions and second period allocations, and no possibility of pecuniary externalities. It is a constrained Pareto-optimum because wealth can be transferred across states only by trading the given sets of assets; but in this particular case, assets do not exist (by assumption). Therefore, the welfare authority has no policy instruments to achieve the desired allocation.

It was proved, however, that this is a very special case and it cannot be generalized. In fact, Hart (1975) has shown that in any economy with two goods, two states of nature, and two periods, there are several Radner equilibria, and two of them are Pareto-ordered. As Mas-Colell et al. (1995, p. 712) have observed the consensus emerging in the literature is that failures of restricted Pareto-optimality are not only possible but even typical.

Geanakoplos and Polemarchakis (1986) have shown that in a *two period* pure exchange model with a fixed set of securities denominated in terms of goods, equilibrium is *generally inefficient* in a very strong sense. More precisely, if markets are **incomplete**, and there are more than one goods at each date, then it is possible to make all agents better off by redistributing goods and securities at the first date. With two or more goods, changes in the goods and securities in the first date have an effect on the relative prices in the second date. These changes in prices, which are not taken into account by agents making decisions in the first period, create **pecuniary externalities**. With **complete** markets, pecuniary externalities *do not arise* because marginal rates of substitution are all equalized, but with incomplete markets they *do. This is what makes it possible for all participants to improve their welfare position*.

The result of Geanakoplos and Polemarchakis (1986) reinforced by the result of Geanakoplos, Magill, Quinzii and Dreze (1990) who extend the constrained inefficiency result to firms "…seem to make a strong case for government intervention" (Geanakoplos, 1990, p. 27).

5.   Concluding remarks

The following conclusions may be drawn from this paper:

In a world of complete markets and identical probability beliefs over the states of nature across agents, all risk-sharing will be provided by capital markets. Fiscal transfers of income across regions are not required. Nonetheless, even in this case, fiscal transfers are needed for distributive purposes. The risk-sharing mechanism provided by the capital markets may benefit the rich but not the poor who do not hold a well-diversified portfolio of assets (De Grauwe, 2001).

In all other cases (and in particular when markets are incomplete) consumption cannot be smoothed by capital markets alone. In incomplete markets an equilibrium allocation need not be Pareto-optimal due to the inability of market participants to transfer incomes across *all* states of nature. That is, the marginal rates of substitution in consumption are not equalized across all states of nature. Hence, if risk-sharing is left to the market forces alone, the allocation or risk will not be optimal, and the risk-sharing will be incomplete. Since incomplete financial markets are inefficient, fiscal transfers of income across regions are needed for the survival of a monetary union. The introduction of the concept of the constrained Pareto-optimality does not solve the problem, since as it was proved (Geanakoplos and Polemarchakis, 1986) incomplete markets are in general constrained inefficient.

Acknowledgements

Notes

[1] Policy questions are discussed extensively in, for example, De Grauwe (2000), Goodhart (1995), and Tavlas (1993).

[2] This work is reviewed in De Grauwe (2000).

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