Strategic Aspects of Exchange Rate Regime Choice for the Accession Countries[∇]

JAN FIDRMUC[*]

ECARES, UNIVERSITÉ LIBRE DE BRUXELLES;
CENTER FOR EUROPEAN INTEGRATION STUDIES (ZEI), UNIVERSITY OF BONN;
CEPR, LONDON; AND WILLIAM DAVIDSON INSTITUTE, MICHIGAN.

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Abstract:

This paper surveys the literature on economic benefits and costs of adopting the euro by the countries that will be included in the next round of EU enlargement. The emphasis is on implications of common currency as identified by the theory of optimum currency areas. In particular, I discuss correlation of output shocks between the candidate countries and the EMU core and effectiveness of mechanisms for absorbing adverse effects of asymmetric shocks. Then, I offer suggestions on the optimal path towards full EMU membership.

Keywords: currency union, asymmetric shocks, migration, risk sharing, option value of waiting, European Union.

JEL Categories:

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1 Introduction

Within a few years, the EU will admit up to ten new members[1], including eight formerly socialist economies. With the process of EU enlargement to the East now apparently (and hopefully) firmly on track, the obvious next question is that of adoption of the euro and full EMU membership (as is discussed below, these two decisions are not necessarily conjoint). It is envisaged that the new member countries will join the EMU in due course after acceding to the EU. In fact, one of the obligations of membership that the candidate countries are obliged to take on is adherence to the aims of political, economic and monetary union. In other words, unlike Denmark and the UK, the new members will not be given the option to opt out from EMU membership. There is, nevertheless, substantial latitude with respect to the paths the new member countries can pursue. On the one hand, the new members may seek full EMU membership shortly after accession. As the Maastricht criterion of exchange-rate stability requires that the EMU hopefuls spend two years in the new Exchange Rate Mechanism (ERM2) without realignment, the earliest date of full EMU membership is 2006-07 (assuming that EU enlargement will take place in 2004-05 and that the new members meet the other Maastricht criteria). Even more rapid strategy is *unilateral euroization*, as suggested recently by several analysts (see Schoors, 1999; Bratkowski and Rostowski, 2000; Coricelli, 2000; Nuti, 2000) whereby a country adopts the euro as legal tender (either parallel to or replacing the domestic currency) even before EU accession (or instead of seeking EU/EMU membership at all). On the other hand, the new members could also follow the example of Sweden and postpone EMU membership almost indefinitely by deliberately failing to meet some of the Maastricht criteria (for example by not entering the ERM2).[2] Hence, the euro-zone can expand Eastwards in as little as four or five years from now, but it can also remain easily unchanged for a decade or more.

In this article, I review the growing literature on optimality of EMU membership from the point of view of the new members. Should they seek full EMU membership as soon as possible? Or would their economic interest be better served by adopting a gradual wait-and-see approach? I start, in Section 2, by discussing the arguments put forward by the theory of optimum currency areas and their implications for the candidates for membership. Then, I

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[1] Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.
[2] In theory, the Commission might try to force the new members to make good on their pre-accession commitments with respect to full EMU membership once they are deemed ready. However, the leverage of even small member countries on EU decision making is such that the Commission would never risk a deadlock by, for instance, proclaiming a member country fit for the EMU without unequivocal consent of the country in question.

proceed by discussing recent empirical evidence on the various aspects of EMU membership. In section 3, I show that the candidate countries continue to encounter shocks that are largely uncorrelated with those affecting the core EMU countries. In section 4, I argue that labor mobility has been low and falling despite rising regional disparities in earnings and unemployment. Even more importantly, migration does not appear very effective as a mechanism for absorbing adverse effects of asymmetric shocks – even when the relationship between migration and local economic conditions appears statistically significant, the potential impact of migration on smoothing inter-regional disparities is economically small. In section 5, I point out the lack of mutual insurance through fiscal transfers in the EU. In section 6, finally, I discuss some strategic considerations related to the candidate countrie s' path towards full EMU membership. Adopting the euro is a costly and largely irreversible decision with an uncertain payoff. Therefore, postponing (in the short to medium term) EMU membership implies that the prospective members retain an option not to enter or enter later, possibly under different and more favorable conditions. Similarly, proceeding gradually, for example by implementing first a currency board or another rigid regime but staying short of full membership, helps reveal partial information about the eventual outcome of adopting the euro without incurring the full cost of membership. Because of the underlying uncertainty, the option value of waiting or proceeding gradually is positive and may outweigh the costs of delaying the expected benefit of EMU membership. Hence, the available evidence as well as strategic considerations weigh in strongly in favor of a gradual approach rather than early EMU membership.

2 Benefits and Costs of Common Currency[3]

Benefits

The literature has identified several important channels through which common currency benefits economic development. Being able to use the same money across national borders reduces transaction costs and eliminates exchange rate volatility vis-à-vis union partners. Lower transaction costs and lower uncertainty in turn encourage trade flows between

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[3] Unless specifically referring to the EMU, this section deals with the benefits and costs of participation in a currency union in general. In this context, a *currency union* can take several forms, such as a monetary union, a country using another country's currency, or a bilateral or multilateral agreement establishing fixed and irrevocable parity between the member countries' currencies.

currency-union members. Frankel and Rose (2000) and Rose (2000) use the gravity model to assess the impact of common currency on trade. They find that countries using the same currency on average trade three times more with each other compared to otherwise similar countries that use different currencies. This finding obtains after controlling for other factors that can potentially enhance bilateral trade such as adjacency, common language, preferential trade areas or colonial heritage. They also argue that higher trade directly translates into higher economic growth. According to their estimates, every one percentage point increase in trade-to-GDP ratio raises GDP per capita by 1/3 percentage point over 20 years. Thus, participation in the EMU should, over the long term, lead to higher trade and, more importantly, higher welfare (of course, the actual effect of EMU membership will not necessarily by a factor of three, as Frankel and Rose's finding is an average over dozens of quite different currency unions). Moreover, this gain will be in addition to the positive stimulus to trade of participation in the EU customs union – most studies tend to find that EU membership raises bilateral trade approximately by 40-50 % (see, for example, Fidrmuc and Fidrmuc, 2003).

Another important gain from EMU membership that is particularly relevant for the formerly socialist economies is that it introduces an external policy constraint (see Cukierman, 1995). Membership in a currency union can be a way of importing low inflation and prudent monetary policy. In addition, the Growth and Stability Pact imposes explicit rules on member countries' conduct of fiscal policy. All formerly socialist economies experienced periods of high inflation, especially during the early stages of transition. In a high inflation environment (or in one with recent history of high inflation), an external anchor such as a rigid exchange-rate peg provides an effective stabilization tool (see Végh, 1993, Sahay and Végh, 1996). In that respect, adoption of another currency is the ultimate external anchor. Indeed, yielding the conduct of monetary policy to the ECB and submitting to strict rules on fiscal prudence (and external monitoring) is likely to deliver policy outcomes that would not have been attainable otherwise (especially in countries that already have a record of failed stabilizations and where home-grown attempts at reigning in inflation might not be credible).

A powerful argument in favor of euroization and even more so of full EMU membership is that investors will perceive candidate countries' assets as less risky. There are several reasons why the risk premium should fall in the wake of EU/EMU membership or euroization. Firstly, the perceived risk of devaluation may be lower for euro-denominated assets (and vanishes completely for investors located in another EMU country) than for assets denominated in the original currencies. Second, the markets may perceive EU/EMU

membership as a guarantee of political stability, rule of law and sound economic policies. Third, investment in candidate countries may be deemed more attractive because it will give access to the entire EU market.

Currently, interest rates in the candidate countries and considerably higher than those prevailing in the EMU. Lower risk premium makes interest rates drop, which in turn results in higher investment (both domestic as well as foreign). Greater capital accumulation then brings about higher economic growth. Baldwin, Francois and Portes (1997) use a computable general equilibrium model to assess, *inter alia*, the impact of a lower risk premium on candidate countries' income levels. They find that a reduction in risk premiums on candidate countries' assets to the level of Portugal will result in a long-term income gain of 18.8%, compared to 1.5% in the baseline scenario without the risk-premium effect. More recently, Bris, Koskinen and Nilsson (2002) indeed find that large firms in ten EMU countries (leaving out Greece and Luxembourg) saw the value of their equity (measured by Tobin's Q) rise by more than those in the three EU countries that stayed out of the EMU (Denmark, Sweden and the UK), and Norway and Switzerland. Moreover, they find that the gains were more profound in the countries that experienced currency crises in the past (and in those countries, the valuation of small firms increased as well).

Among other benefits of adopting a common currency are the following: Membership in a currency union fixes the value of foreign debt denominated in the union currency, thus reducing the uncertainty about the future costs of servicing foreign debt (clearly, this argument can also go against EMU membership, if the bulk of the candidate countries' debt is denominated in US dollar or other currencies). Membership in a larger currency union reduces vulnerability to currency crises. Finally, membership in the EMU may be favored for political reasons. Currency is perceived as an important symbol of national sovereignty, just as a national flag, anthem, language or a soccer team. In as much as fostering political integration in Europe is in the candidate countries' long term interest, adoption of the euro may be pursued as a stepping stone to a closer political union.

Costs

Just as there are benefits, membership in a currency union also brings about certain costs. The loss of policy independence is among the most important of them. Members of a currency union relinquish autonomous monetary policy and instead are subject to policy decision of the union's monetary authority. Depending on institutional design, the participating countries may

or may not have much influence on common monetary policy. In the EMU, as most candidate countries are relatively small, it is likely that their interests will not weigh in heavily in ECB's decision making. Without an independent monetary policy, the member countries' ability to respond to idiosyncratic economic developments is reduced. Moreover, the limits on public deficits and debt imposed by the Growth and Stability Pact constrain also the independent conduct of fiscal policy, thus further restricting the ability to respond to asymmetric shocks. Both of these constraints are discussed in greater detail below.

The Balassa-Samuelson effect is another potentially negative implication of currency-union membership. Countries at a lower level of development tend to experience higher inflation than developed countries. This disparity obtains because high productivity growth in tradable sectors drives wage growth in both tradable and non-tradable sectors (e.g. services) despite typically lower productivity growth in the latter. Higher inflation in turn leads to real appreciation and eventually deterioration of competitiveness. Countries can counter this development by allowing their currencies to depreciate – this option, however, is not available in a currency union. Therefore, monetary integration involving countries at different levels of economic development may result in persistent inflation differentials and entail non-negligible cost in terms of deteriorating competitiveness for the less developed members.

Euroization (unlike full EMU membership) also entails additional costs due to loss of lender of last resort and loss of seigniorage revenue.[4] Nevertheless, as far as the former is concerned, this is likely to be largely alleviated by the ongoing privatization of the banking sector in the candidate countries, with the bulk of domestic banks being sold to foreign investors, often to large European banks.

The Theory of Optimum Currency Areas

A commonly used framework for assessing the economic optimality of membership in currency unions is the theory of optimum currency areas (OCA), originally formulated by Mundell (1961).[5] The fundamental question posed by the OCA literature is whether the country of region in question is better off with its own currency or whether its economic interests would be better served by participating in a wider currency area. An *optimum currency area* then is a geographical area within which exchange rates should be fixed

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[4] See Horvath (2002c) for more detailed discussion of these two factors.
[5] Horvath (2002a) presents a survey of the ensuing literature.

irrevocably but whose rates should fluctuate vis-à-vis the outside world. Two types of criteria are used to assess the optimality of currency unions. First, countries that are exposed to symmetric output shocks tend to have more synchronized business cycles and thus similar policy preferences. Therefore, yielding the conduct of monetary policy to a common monetary authority will not be associated with excessive costs. Second, even if shocks are largely asymmetric, currency-union membership may still be optimal if the countries possess effective mechanisms for absorbing adverse effects of the shocks. Such absorption mechanisms can be the mobility of labor and capital, price flexibility, or a system of fiscal risk sharing by means of intra-union transfers. The absorption mechanisms in effect facilitate spillovers of shocks to the rest of the union and thus ensure that their effects are mitigated and short-lived.

To illustrate the argument, consider the implications of a negative demand shock. A country with a flexible exchange rate could counter rising unemployment and falling real incomes by allowing its currency to depreciate, thus altering the relative prices and stimulating foreign demand. This option, however, is not available in a currency union, unless the shock is shared by the other union members. Nevertheless, rising unemployment and falling wages may induce an outflow of labor and/or an inflow of capital into the country. Alternatively, prices and wages may fall sufficiently for demand to pick up. Finally, the union may mitigate adverse effects of the shock by channeling additional funds into the country. If none of these absorption mechanisms is effective, the effects of the shock will persist and, in the extreme case, may eventually induce the country to withdraw from the union.

It is important to note that the two OCA criteria do not have to be fulfilled simultaneously. Either symmetry of output shocks or availability of effective absorption mechanisms is sufficient to ensure optimality of a currency union. Also, the arguments of the OCA theory have had no bearing on the criteria that the EU chose for deciding on which countries are fit for EMU membership (the so-called Maastricht criteria). The OCA theory is concerned with the economic desirability of membership in a currency union. Maastricht criteria, on the other hand, were set to ensure fiscal prudence and convergence in inflation rates and to prevent individual member countries from upsetting the union's monetary stability.

Finally, the OCA theory does not necessarily require that only countries that have sufficiently synchronized business cycles can successfully form a currency union. In fact, pooling economically diverse countries in a currency union may be advantageous, as long as

they all have a say in policy making. In that case, neither member country will be able to exert dominant influence on the single monetary policy. Thus, as in an investment portfolio, country-specific risks will be diversified away and monetary policy will respond largely to common and global shocks. From that point of view, the EMU is a substantial improvement over the previous arrangement, where a number of Western European countries pegged their exchange rates to the D-mark and effectively were subject to German monetary policy. Also, this argument goes strongly in favor of the UK entering the EMU so as to provide a counter-weight to the current core formed by Germany, France, Austria and the Benelux countries.[6]

3 Empirical Evidence on Symmetry of Shocks between the Candidate Countries and the EMU

A number of studies estimate correlations of shocks between the candidate countries and various EMU members or the EMU as a whole (see Frenkel, Nickel and Schmidt, 1999; Boone and Maurel, 1999; Jarko Fidrmuc and Korhonen, 2001; Babetski, Boone and Maurel, 2002; and Horvath, 2002b). They build on similar analyses carried out during the early and mid 1990s assessing the desirability of EMU. Although the methodologies used differ, the most common approach follows Bayoumi and Eichengreen (1993) in using the bivariate VAR methodology to identify and measure correlations of demand and supply shocks.[7] The objective of these studies is to assess to what extent the candidate countries are subject to shocks that are similar to those prevailing in the EMU core. If the shocks are by and large positively correlated, then early adoption of the euro is not likely to pose substantial economic problems. If, on the other hand, the shocks are largely asymmetric, then as discussed in the preceding Section the accession countries had better possess effective absorption mechanism, otherwise EMU membership or euroization can potentially lead to divergent policy needs and persistent economic disparities between the new and old members.

Table 1 reproduces the main results of Horvath (2002b) who measures correlations of demand and supply shocks between eight candidate countries that likely to be included in the next wave of EU enlargement and four large EU member countries (Germany, France, Italy and the UK). For comparison, Table 2 presents similar results of Jarko Fidrmuc and Korhonen

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[6] I am grateful to Boyan Tonkov for suggesting this implication.

[7] This terminology is based on the standard aggregate demand – aggregate supply framework, which Bayoumi and Eichengreen used to motivate their analysis. Supply shocks are those that result in permanent changes in output whereas demand shocks affect output only temporarily.

(2001) with correlations of shocks between the candidate countries (as well as the current EU members) and the EMU as a whole. Both studies use quarterly GDP data, although for slightly different time periods.

The common pattern in both sets of estimates is that the correlation of shocks between the accession countries and the core EMU members or the EMU as a whole is very low Essentially no candidate country, with the possible exception of Hungary, encounters shocks that are positively correlated with those prevailing in the EMU as a whole, or with at least two of the core EMU members. Most of the estimated correlation coefficients are very close to zero and for the rest negative figures appear almost as often as positive ones. This contrasts quite sharply with the evidence for majority of EMU member countries, including the smaller ones (Austria, Belgium or the Netherlands). Nonetheless, some of the more peripheral EMU countries, in particular Greece and Ireland, show correlation coefficients that are similarly low as those obtained for the accession countries.

Some studies argue that the OCA criterion of symmetry of shocks should not be considered in a static manner because it is in fact endogenous in the degree of economic integration. However, there is no consensus on how the intensity of integration affects the pattern of shocks. On the one hand, Frankel and Rose (1998) argue that the correlation of shocks between a pair of countries is positively related to the intensity of trade between them. Accordingly, increasing trade and financial integration fosters greater exposure to common shocks as well as wider spillovers of idiosyncratic shocks. Past figures then are not necessarily a good indication of current and future nature of shocks – a country that fails to meet the OCA criterion for EMU membership *ex ante* still may meet it *ex post*, after entering. In contrast, Krugman (1993) argues in favor of the opposite – as transaction costs fall and trade between union members becomes easier and cheaper, countries or regions tend to specialize in those products for which they possess comparative advantage, and thus become more vulnerable to idiosyncratic shocks. Therefore, if membership in the EMU does not appear optimal *ex ante*, it will be even less optimal *ex post*.

Babetski, Boone and Maurel (2002) consider the possibility that the correlation of shocks may change over time and estimate time-varying correlation coefficients of demand and supply shocks. Indeed, given the relative isolation of Eastern Europe under communism and the ongoing reform process, it is not all that surprising that the correlation coefficients estimated over the 1990s are low. Their findings indicate that demand shocks have indeed become more similar over time whereas supply shocks have in fact diverged and become less

correlated (the latter pattern may be due to reform-specific shocks that the candidate countries encounter).

In summary, according to the available evidence, the candidate countries are exposed to shocks that are largely uncorrelated with those prevailing in the EMU. Moreover, the evidence is mixed with respect to shocks becoming more similar over time – while this pattern indeed holds for demand shocks, the opposite is true for supply shocks. Nevertheless, this does not necessarily mean that the adoption of the euro will not be optimal for the candidate countries. Rather, the evidence stresses the importance of adjustment mechanisms in case of EMU membership. Without effective mechanisms for absorbing and mitigating idiosyncratic shocks, however, accession to the EMU or euroization may be costly.

4 Adjustment to Shocks through Migration

If shocks affecting the candidate countries are largely uncorrelated with those prevailing in the EMU core, this increases the need for other adjustment mechanisms such as migration to smooth away the effects of shocks. If migration responds readily to changes in regional economic conditions, idiosyncratic shocks will not bring about long-term differentials in unemployment and wages but instead will result in flows of labor from depressed areas those with more favorable labor-market realizations. This ensures that none of the regions or countries participating in the EMU has preferences for policies that are dramatically different from those implemented by the ECB.

Countries often differ in the way their labor markets adjust in the wake of idiosyncratic shocks. Blanchard and Katz (1992) find that in the US, employment shocks are absorbed primarily through labor mobility instead of causing changes in unemployment or participation rates. In contrast, Decressin and Fatas (1995) find that in Western Europe, the impact of employment shocks on participation rates is much stronger, largely due to low response of migration. Thus, instead of moving and seeking jobs elsewhere, European workers tend to drop out of labor force. This low mobility of European labor is frequently cited as a factor undermining the stability of the EMU.

Given the important role played by migration in facilitating regional adjustment, it is therefore important to assess how effective is migration in this respect in the candidate countries. Huber (2002 a,b) points out that migration rates in five candidate countries (Czech Republic, Hungary, Poland, Slovakia and Slovenia) are lower than in EU countries.

Moreover, migration has been declining in the course of transition despite rising regional disparities (ibid, see also Fidrmuc, 2002).

At the outset of transition, the candidate countries had essentially no (official) unemployment and very egalitarian wage distribution. The transition subsequently brought about rapidly rising unemployment and widening regional disparities in unemployment and especially wages. This implies that the potential gains from moving have increased – but the data suggest that there is actually less rather than more migration. In Fidrmuc (2002), I analyze the effectiveness of migration in facilitating regional adjustment in the Czech Republic, Hungary, Poland and Slovakia and compare it with the pattern obtained for Italy, Spain and Portugal. The analysis relates gross and net migration rates (total immigration and emigration to/from each district, and net immigration, divided by the district's population) to the average wage (normalized by dividing by the national average wage of that year) and unemployment rate prevailing in the district (both lagged by one year) and population density. The analysis is based on inter-regional rather than international migration. Clearly, the latter would be more relevant for an assessment of the candidate countries' adjustment capability in the wake of EMU membership. However, migration between the candidate countries and the EU is currently subject to strict restrictions that will be eventually removed in the wake of EU enlargement. Therefore, any model estimated with past data on international migration would be of little relevance for assessing the potential for post-enlargement migration – the removal of barriers to migration after accession will constitute a structural break in the model.

Table 3 presents the main results of that analysis. The question of interest here is how regional wages and unemployment affect migration flows, and especially whether migration is effective in facilitating regional adjustment to idiosyncratic shocks. Note that in order for migration to effectively absorb region-specific shocks, high wages and low unemployment should be associated with lower gross emigration and higher gross immigration – and thus high net immigration into the district. This, however, is not the pattern obtained for the candidate countries. In fact, high wages apparently encourage both higher immigration as well as emigration whereas unemployment does not appear to affect gross migration in a statistically significant way. Net migration, on the other hand, does respond to regional economic conditions more-or-less as expected: unemployment reduces net immigration whereas high wages encourage it (although the latter effect is not always significant).

This might suggest that most migration flows are between relatively prosperous regions and thus do not lead to a net flow of labor from depressed areas to those with better economic

realizations. Moreover, the effect of net migration on regional disparities is economically very small – relatively sizeable differentials in unemployment rates and wages give rise only to very small net migration flows. It is difficult to pin down the reasons for the low labor mobility in the candidate countries and for the low net migration from poor to rich regions. The list of plausible explanations includes high fixed costs of migration and liquidity constraints that prevent low-wage earners from moving, and a tight and inflexible housing market.

Comparing the candidate countries with Southern EU countries, Italy is the only country that stands out – both unemployment and average wages affect gross migration flows in the expected way, although the impact of wages is not statistically significant. The patterns of migration in Spain and Portugal, on the other hand, are again rather disappointing. In summary, migration in the candidate countries appears little effective in absorbing adverse effects of idiosyncratic shocks. Therefore, once the candidate countries adopt the euro, asymmetric shocks are likely to have highly persistent effects – unless they can be absorbed by other channels.

5 Fiscal Risk Sharing in the EMU

If as the evidence presented in the previous section indicates labor mobility largely fails to facilitate regional adjustment, there will be greater need for other absorption mechanisms such as fiscal risk sharing. Countries often have formalized programs facilitating fiscal transfers between regions. These programs may fulfill one of the following two (or both) objectives: redistribution and risk sharing. The former refers to fiscal redistribution from rich to poor regions regardless of the current phase of the business cycle so as to encourage convergence in per capita incomes. The latter makes fiscal transfers conditional on business cycle developments so that regions hit by favorable shocks are net contributors and those hit by adverse shocks are net benefactors. The risk-sharing objective thus may be in conflict with the redistribution motive as fiscal insurance may also require that poor regions make transfers to rich ones.

The interest in the use of fiscal policy as a mechanism for absorbing adverse effects of idiosyncratic shocks has been spurred by the findings of Sachs and Sala-i-Martin (1992) who find that in the US, changes in States' contributions to and transfer receipts from the federal budget absorb approximately 40 % of state-specific variations in personal income. Although later studies indicate lower extent of shock absorption, they clearly show that inter-regional risk sharing is an important aspect of fiscal policy in developed countries (Bayoumi and

Masson, 1995; von Hagen, 1998; von Hagen and Hepp, 2001) For example, Mélitz and Zumer (2002) find that national/federal fiscal policy absorbs around 20 % of shock-induced changes in personal income in France, the UK and the US and 10-14 % in Canada (their methodology is such so as to measure risk sharing but not redistribution).

Although the EU budget provides for sizeable fiscal transfers, the objective is exclusively redistribution – from rich and industrial areas to poor and agricultural regions. Indeed, the very idea that, for instance, Greece or Portugal should ever have to make transfers to Germany or Sweden seems unthinkable given the current practice. This absence of an EMU-wide stabilization policy tool has been pointed out as a factor potentially undermining the stability of the monetary union (see Fatás, 1998, and the studies cited above). The same argument holds for the candidate countries' strive towards EMU membership – if a country is hit by a large asymmetric shock, its fiscal obligations towards and receipts from the EU will remain largely unchanged. Therefore, the countries will have to rely on national policy tools to deal with the effects of the shock. Yet, their ability to do so by counter-cyclical conduct of national fiscal policy will be constrained by the Growth and Stability Pact, which imposes limits on public deficit and debt levels. Clearly, countries that, under normal economic conditions, have low debt-to-GDP ratio and surplus public finances will enjoy sufficient leeway in their conduct of fiscal policy. But for those countries already close to violating the debt and deficit limits, the Growth and Stability Pact introduces a pro-cyclical bias into national fiscal policy.

6 Strategic Considerations

The adoption of the euro either through full EMU membership or euroization will be a costly and largely irreversible step (in fact, EU treaties and regulations formalize procedures for entering the EMU but present no provisions for exiting). As the previous sections show, the outcome of this step is highly uncertain. It is conceivable that the new members will encounter no major asymmetric disturbances and, with intensifying economic integration, their business cycles will become increasingly synchronized with those in the EMU core. It is, however, also possible that, given the currently low degree of correlation of shocks, they will continue to experience largely idiosyncratic economic developments. With the straightjacket of single monetary policy along with restrictions on counter-cyclical conduct of fiscal policy and low labor mobility, they will find themselves unable to deal with these shocks effectively. Therefore, the decision to adopt the euro may result in substantial economic costs.

The choice whether or not a country should adopt the euro is therefore analogous to an investment decision. A potential member country can decide whether or not it desires to enter the EMU and has considerable flexibility in choosing the timing of its entry. Once it enters, however, the decision is irreversible and the eventual payoff is uncertain. These types of decisions can be analyzed using options theory. By postponing the entry, candidate countries retain the *option* not to enter, and/or enter under different, more advantageous conditions (for example, with a more favorable conversion rate for their currency). It can be shown analytically, that the value of this option is unequivocally positive (see Pindyck, 1991; and Dixit, 1992, 1993). This is so because waiting brings the benefit of obtaining additional information about the eventual outcome (in this particular case, for example, about realizations of future shocks and the degree of synchronization of business cycles between the EMU and the candidate countries). By procrastinating, the country avoids incurring the (irrecoverable) costs of a decision that in the future may turn out not to be optimal. On the other hand, the cost of waiting is that the payoff from adopting the euro is delayed. Because of the underlying uncertainty, postponing EMU entry may therefore be preferable to early membership. The candidate countries can also benefit from proceeding gradually – instead of adopting the euro as soon as possible, they may be better off by implementing a relatively rigid fixed exchange-rate regime or a currency board and proceeding with full EMU membership or eurization only later. Adopting an exchange-rate regime that is close to, but stops short of, full EMU membership, reveals additional information about the eventual outcome of this step, while the country still retains the option of not entering and avoids incurring the full cost. Again, the cost of such an approach is that the country does not receive the full benefit of adopting the euro straight away. But given the irreversibility of the decision and uncertainty about its outcome, the positive option value of waiting may more than outweigh this cost (Dewatripont and Roland, 1995, formulate this argument in the context of choosing between adopting a big bang and a gradual reform). Moreover, the higher is the uncertainty and/or the higher is the cost of reversing the decision, the higher is the option value of waiting. Hence, the optimal length of *procrastination* may differ from country to country, depending on their specific conditions (such as the degree of similarity of output shocks and/or availability of effective absorption mechanisms).

7 Conclusions

The evidence reviewed in this paper indicates that the candidate countries currentlyt encounter shocks that are largely uncorrelated with those in the EMU core. After EMU entry, the set of tools available to deal with asymmetric shocks will be reduced – members will all be subject to the same monetary policy and their ability to engage in counter-cyclical stabilization through fiscal policy will be constrained by the requirements of the Growth and Stability Pact. The available evidence also suggests that migration is not an effective channel of regional adjustment to idiosyncratic shocks. Moreover, the EU will impose transitional barriers to international migration following EU enlargement, which will further restrict the candidate countries' adjustment capability. Finally, there is essentially no fiscal risk sharing among the EU or EMU countries. There is certainly little doubt that EMU membership is desirable and beneficial in the long term. Nevertheless, a rapid entry to the EMU does not seem to be the optimal strategy in the short to medium term. Rather, the candidate countries can benefit from postponing the entry or proceeding gradually. The value of the option entailed in such a strategy is likely to outweigh the costs of delaying the benefits of membership.

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Table 1 Correlation of Supply and Demand Shocks between Candidate Countries and Four Large EU Countries

Supply Shocks				
	Germany	**France**	**UK**	**Italy**
Czech Rep.	-0.05	-0.06	-0.14	0.26
Slovakia	-0.04	0.26	-0.03	0.12
Poland	0.00	0.07	0.17	0.03
Hungary	**0.28**	-0.02	-0.30	-0.06
Slovenia	0.02	**0.28**	**0.28**	0.09
Estonia	0.08	-0.05	-0.15	0.02
Latvia	-0.07	0.18	0.16	0.04
Lithuania	-0.16	-0.31	-0.04	-0.03
Demand Shocks				
	Germany	**France**	**UK**	**Italy**
Czech Rep.	0.10	0.09	0.03	0.14
Slovakia	0.04	-0.31	-0.10	0.18
Poland	0.14	0.07	0.23	0.24
Hungary	-0.40	0.26	**0.52**	**0.39**
Slovenia	0.03	**0.29**	0.10	-0.02
Estonia	0.05	0.19	0.09	0.06
Latvia	0.11	-0.21	-0.11	0.11
Lithuania	**0.33**	0.18	-0.03	-0.21

Source: Horvath (2002b). Notes: Computed with quarterly GDP data over 1993:1 – 2000:3 (Hungary 1995:1 – 2000:3). Bold figures indicate correlation coefficients that are statistically significant at the 5% level.

Table 2 Correlation of Supply and Demand Shocks between Candidate and Member Countries and the EMU

	Supply Shocks	Demand Shocks		Supply Shocks	Demand Shocks
Austria [(a), SA]	0.38	0.08	Bulgaria [(d)]	-0.03	0.03
Belgium [(a), SA]	0.53	0.00	Croatia [(e)]	0.21	-0.18
Finland [(a)]	0.30	0.06	Czech Rep. [(d)]	0.04	-0.15
France [(a), SA]	0.69	0.30	Estonia [(e)]	0.25	0.12
Germany [(a)]	0.66	0.18	Hungary [(e)]	0.46	0.25
Greece [(a), IP]	0.05	-0.01	Latvia [(e)]	0.30	-0.49
Ireland [(a), IP, SA]	-0.14	0.13	Lithuania [(e)]	-0.11	-0.49
Italy [(a), SA]	0.52	0.57	Poland [(e)]	0.08	0.28
Netherlands [(a)]	0.47	0.04	Romania [(b), IP]	0.02	0.03
Portugal [(a)]	0.45	0.09	Slovakia [(c)]	0.05	-0.05
Spain [(a)]	0.22	0.16	Slovenia [(d)]	0.15	-0.18
Denmark [(a)]	0.18	0.13			
Sweden [(c), SA]	0.24	0.09			
UK [(a), SA]	0.21	-0.13			

Source: Jarko Fidrmuc and Ikka Korhonen (2001).

Notes: Computed with quarterly GDP or industrial production (indicated by superscript IP), for the following periods: (a) 1991-2002; (b) 1992-2000; (c) 1993-2000; (d) 1994-2000; (e) 1995-2000. Data indicated with superscript SA are seasonally adjusted.

Table 3 Determinants of Migration

	Czech Republic, 1992-98, 518 obs.						Slovakia, 1992-96,						Hungary 1994-98, 100 obs	
	IN		OUT		NET		IN		OUT		NET		NET	
Unempl. Rate (lagged)	-0.017	(2.90)	0.002	(0.52)	-0.022	(2.97)	-0.006	(2.08)	0.003	(1.56)	-0.008	(2.75)	-0.024	(3.47)
Wage Ratio (lagged)	0.462	(2.71)	0.469	(4.16)	0.069	(0.32)	0.076	(0.37)	0.054	(0.37)	0.173	(0.82)	0.550	(1.25)
Population Density (log)	-3.864	(5.43)	-0.061	(2.18)	-4.096	(4.65)	0.057	(1.14)	0.057	(1.70)	-0.008	(0.23)	-0.222	(4.54)
Dummy Suburb													1.421	(14.26)
Constant	19.482	(5.67)	1.047	(6.68)	19.781	(4.64)	0.567	(2.12)	0.530	(2.88)	-0.095	(0.46)	0.779	(2.48)
Year Dummies	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
District Fixed Effects	Yes		Yes		Yes		No		No		No		No	
District Random Effects	No		No		No		Yes		Yes		Yes		Yes	
R^2 (within)	0.567		0.780		0.124		0.663		0.865		0.270		0.012	
R^2 (between)	0.047		0.125		0.056		0.115		0.051		0.098		0.948	
R^2 (overall)	0.042		0.325		0.031		0.271		0.514		0.167		0.895	
Breusch-Pagan (p-value)	1022.1	(0.00)	1071.1	(0.00)	290.1	(0.00)	244.52	(0.00)	233.28	(0.00)	98.67	(0.00)	19.25	(0.00)
Hausman (p-value)	48.82	(0.00)	15.90	(0.07)	21.36	(0.01)	4.32	(0.74)	3.21	(0.87)	8.22	(0.31)	4.81	(0.57)

Source: Fidrmuc (2002). T-statistics in parentheses. The dummy for suburbs denotes the district of Pest in Hungary, which completely encircles the capital city of Budapest.

Table 3 Determinants of Migration (continued)

	Poland 1992-93 and 1996-97, 196 obs.						Italy 1984-95, 219 obs.					
	IN		OUT		NET		IN		OUT		NET	
Unempl. Rate (lagged)	0.003	(0.86)	0.003	(0.91)	-0.002	(0.95)	-0.010	(4.83)	0.008	(4.36)	-0.020	(7.55)
Wage Ratio (lagged)	0.669	(4.47)	0.533	(3.52)	-0.045	(0.41)	0.211	(0.93)	-0.222	(0.99)	0.581	(2.39)
Population Density (log)	-0.305	(11.69)	-0.358	(12.94)	0.137	(5.63)	-0.155	(3.62)	-0.024	(0.41)	-0.099	(2.65)
Constant	2.087	(13.04)	2.534	(14.96)	-0.637	(4.43)	1.332	(4.92)	0.900	(2.69)	0.150	(0.57)
Year Dummies	Yes		Yes		Yes		Yes		Yes		Yes	
District Fixed Effects	No		No		No		No		No		No	
District Random Effects	Yes		Yes		Yes		Yes		Yes		Yes	
R^2 (within)	0.418		0.628		0.067		0.401		0.479		0.173	
R^2 (between)	0.810		0.837		0.482		0.406		0.231		0.752	
R^2 (overall)	0.673		0.787		0.446		0.391		0.245		0.657	
Breusch-Pagan (p-value)	8.25	(0.00)	56.68	(0.00)	171.37	(0.00)	751.66	(0.00)	873.80	(0.00)	359.01	(0.00)
Hausman (p-value)	3.77	(0.58)	3.18	(0.67)	11.12	(0.05)	8.70	(0.80)	18.15	(0.15)	12.03	(0.53)

Source: Fidrmuc (2002). T-statistics in parentheses.

Table 3 Determinants of Migration (continued)

	Spain 1984-94, 187 obs.						Portugal 1987-92, 30 obs.					
	IN		OUT		NET		IN		OUT		NET	
Unempl. Rate (lagged)	-0.009	(1.44)	-0.002	(0.34)	-0.006	(1.56)	-0.008	(0.46)	-0.028	(1.41)	0.020	(0.72)
Wage Ratio (lagged)	0.277	(1.25)	0.355	(1.91)	-0.329	(2.31)	2.435	(3.55)	0.773	(1.37)	1.661	(1.80)
Population Density (log)	-0.039	(0.62)	3.797	(3.61)	0.053	(2.94)	-0.247	(4.02)	-0.248	(3.28)	0.001	(0.01)
Constant	0.469	(1.33)	-16.870	(3.70)	0.237	(1.33)	-0.944	(1.82)	0.868	(2.81)	-1.813	(2.37)
Year Dummies	Yes		Yes		Yes		Yes		Yes		Yes	
District Fixed Effects	No		Yes		No		No		No		No	
District Random Effects	Yes		No		No		No		No		No	
R^2 (within)	0.432		0.692		0.072		0.639		0.513		0.366	
R^2 (between)	0.031		0.112									
R^2 (overall)	0.229		0.039									
Breusch-Pagan (p-value)	288.90	(0.00)	364.86	(0.00)	0.45	(0.50)	2.61	(0.11)	0.21	(0.65)	0.70	(0.40)
Hausman (p-value)	4.32	(0.99)	7796.84	(0.00)	11.10	(0.60)						

Source: Fidrmuc (2002). T-statistics in parentheses.