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IMPLICATIONS OF COUNTRY SIZE AND TRADE OPENNESS FOR EURO AREA ENLARGEMENT

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The EU is a group of economies exhibiting differences in terms of their structural characteristics, as is the euro area which comprises a subset of EU countries. The structural differences between these countries have enabled them to exploit gains from specialisation in production which is at the root of the observed strong trade interactions. Euro area countries, by sharing the same currency (the euro) and thus avoiding risks derived from bilateral exchange fluctuations, have seen trade expand by a somewhat larger proportion.¹

In addition to benefiting from expanded trade flows, countries joining a currency union face the cost of foregoing national monetary stabilisation actions. Analysts have drawn welfare implications at both the monetary union and country levels based on the degree of business cycle synchronisation across participating states. Cross-country structural differences affect the performance of a currency union's monetary stabilisation in other ways. Two key structural characteristics that may play a role in this respect are country size and the trade-off between output and inflation. The latter, which is known to imply a difficult policy choice, is a supply-side feature that is influenced by the degree of openness to international trade. Therefore, the fact that EU economies differ in size and trade openness may have an impact on monetary union stabilisation as well as welfare implications for both actual and prospective euro area countries.

The study of the euro area enlargement process requires detailed consideration of EU countries' structural characteristics and the conduct of monetary union stabilisation. This article presents results in this direction, devoting some attention to the likely welfare consequences of EU countries' differences in size and trade openness.

Country size and trade openness

Table 1 reports data on size and trade openness for the EU, including the euro area's current twelve participating states.² Country size is measured as the respective share in EU's real GDP, while openness is measured as the ratio to real GDP of the average of exports plus imports from outside the respective country or region. The latest information is reported, the year 1991 (the year after German reunification) being used as a reference point.

One first conclusion from Table 1 is that EU countries exhibit considerable differences in both country size and trade openness. Moreover, these two structural parameters do not exhibit a very clear pattern. Although there is some evidence of an inverse relationship between size and openness, the link is subject to many exceptions – in line with existing international comparisons.³ Naturally, every euro area country is both smaller and – in light of significant intra-regional trade – more open to global trade than the region as a whole. Also in line with an inverse relationship between size and openness, the three largest euro area countries, namely, Germany, France and Italy (which altogether account for almost 70 percent of euro area GDP), tend to be relatively more closed – in terms of trade to GDP ratios. Among non-euro area EU countries,



EU countries differ considerably in size and openness

* European Central Bank. This article draws on results in previous work by the author. The views expressed here do not necessarily reflect those of the European Central Bank.

¹ Evidence produced by Rose (2000) and others suggests that currency unions have historically led to a substantial increase in trade. This increase in trade may take place slowly over time, as the more modest increases in trade that have sometimes been attributed to EMU to date would indicate. For a survey on this literature, see Rose and Stanley (2005).

² Slovenia will adopt the euro on 1 January 2007.

³ Alesina et al. (2005) summarise both the evidence and arguments in favour of such inverse link. The evidence is rationalised with the notion that trade openness, by enhancing the magnitude of the market facing a given country, increases the benefits of small size. Conversely, small countries have a strong interest in maintaining access to international markets (including via multilateral and regional means). However, many studies report that there is no simple linear relationship between size and openness, with size in particular being influenced by many other determinants that have not only economic but also historical and socio-cultural roots (see e.g. Alesina and Spolaore, 2003).

Table 1
Country shares in EU real GDP and trade openness

	Share in EU real GDP in %		Trade openness ^{a)} in %	
	1991	2004	1991	2004
<i>EU</i>	100.0	100.0	-	-
<i>Euro area countries</i>	79.6	71.1	8.8	16.6
Austria	2.6	2.4	36.3	48.6
Belgium	3.1	2.8	68.2	82.3
Finland	1.5	1.5	22.4	34.3
France	17.6	15.8	22.2	25.8
Germany	28.1	23.5	26.0	35.5
Greece	1.3	1.4	22.1	25.2
Ireland	0.6	1.1	55.4	72.5
Italy	12.3	10.3	26.2	29.7
Luxembourg	0.2	0.2	102.7	135.4
Netherlands	4.5	4.2	52.7	62.7
Portugal	1.2	1.2	33.6	34.5
Spain	6.6	6.8	17.6	27.5
<i>Non-euro area countries</i>	20.4	28.9	-	-
Cyprus	0.1	0.1	53.0	49.1
Czech Republic	0.3	0.9	33.6	71.4
Denmark	1.7	2.1	34.2	42.9
Estonia	0.0	0.1	29.3	82.6
Hungary	0.4	0.9	35.2	67.6
Latvia	0.2	0.1	14.0	51.6
Lithuania	0.3	0.2	6.0	55.8
Malta	0.0	0.0	95.7	80.6
Poland	1.0	2.2	23.3	38.8
Slovenia	0.2	0.3	33.9	60.7
Slovak Republic	0.4	0.4	13.1	76.1
Sweden	3.1	3.0	26.5	42.1
United Kingdom	12.7	18.6	23.7	26.9

^{a)} Trade openness is defined as the ratio to real GDP of the average of exports plus imports from outside the respective country or region.

Sources: Eurostat, OECD and IMF.

Most of the new member states are small open economies

the UK is likewise the largest and least outward-oriented economy. Examination of EU countries other than the four largest suggests that it is much more difficult to identify a pattern in terms of the relationship between openness and size. On the one hand, the inverse relationship between these two characteristics receives support from many small economies that are also very open to international trade. This is especially the case of the euro area countries Belgium, Ireland and Luxembourg, as well as most of EU's new member states (NMS) with the exception of Poland. For other EU countries, the evidence suggests that the inverse link between size and openness is not so clear. With regard to the two euro area countries of intermediate size, the

Netherlands is rather open to international trade, while Spain instead ranks among the most closed euro area economies. Among the remaining countries, Finland, Greece and Portugal appear not to be so open to trade, while Austria, Denmark, Poland and Sweden exhibit a higher degree of openness.

The wide diversity of situations concerning size and openness implies that different countries may experience different outcomes as a result of adopting the euro. Despite such diversity, it is worth emphasising that most of EU NMS can be safely characterised as a group of small open economies. At present, the smaller of these participate in ERM II and have plans to join the euro area in 2010 at the latest. Moves towards EMU entry appear to proceed at a slower pace in the three largest EU NMS (namely, Czech Republic, Hungary and Poland), which currently aim at fulfilling the convergence criteria (see Table 2). In the following, reference will be made to all EU NMS as a single group in order to help derive the welfare implications involved in euro area enlargement for countries of small size and a high degree of trade openness. The reader

should bear in mind that the relevant time frame for euro adoption varies from case to case.

A simple monetary union framework

There are different ways to analyse the role of structural cross-country differences in monetary union stabilisation. One framework that is very useful for this purpose is the one developed by Sánchez (2006a, 2007). It is arguably the simplest approach that can adequately address the type of problems at hand. The model refers to two heterogeneous countries and distinguishes between two types of exogenous driving forces, namely, aggregate shocks and sectoral productivity shocks. Furthermore, despite the

Table 2
Economic convergence indicators

		Annual HICP inflation (in %)	Long-term interest rate (in p.p.a.)	General government deficit ^{a)} (in % of GDP)	General government gross debt ^{a)} (in % of GDP)
Cyprus	2004	1.9	5.8	- 4.1	71.7
	2005	2.0	5.2	- 2.4	70.3
	2006	2.3	4.2	- 2.1	69.1
Czech Republic	2004	2.6	4.8	- 2.9	30.6
	2005	1.6	3.5	- 2.6	30.5
	2006	2.4	3.7	- 3.2	31.5
Estonia	2004	3.0	-	1.5	5.4
	2005	4.1	-	1.6	4.8
	2006	4.4	-	1.4	3.6
Hungary	2004	6.8	8.2	- 5.4	57.1
	2005	3.5	6.6	- 6.1	58.4
	2006	3.0	6.9	- 6.7	59.9
Latvia	2004	6.2	4.9	- 0.9	14.6
	2005	6.9	3.9	0.2	11.9
	2006	7.0	3.8	- 1.0	11.3
Malta	2004	2.7	4.7	- 5.1	75.5
	2005	2.5	4.6	- 3.3	74.5
	2006	3.1	4.3	- 2.9	74.0
Poland	2004	3.6	6.9	- 3.9	41.8
	2005	2.2	5.2	- 2.4	41.9
	2006	1.3	5.1	- 3.0	45.5
Slovak Republic	2004	7.5	5.0	- 3.0	41.6
	2005	2.8	3.5	- 2.9	34.5
	2006	4.1	4.1	- 2.7	34.3
Sweden	2004	1.0	4.4	1.8	50.5
	2005	0.8	3.4	2.9	50.3
	2006	1.4	3.6	2.2	47.6
Latest reference values		2.8	6.1	- 3	60

Note: No information on the exchange rate criterion is reported. Unless otherwise stated, data for 2006 cover the period up to August only.
^{a)} Country information for 2006 are European Commission forecasts. Reference values are for 2005.
 Deficit is indicated by (-), while surplus is indicated by (+).

Sources: Eurostat and European Commission.

model's simplicity, its key results remain insightful when one allows for a larger number of countries and some additional transmission channels.⁴

More concretely, the simple framework used here includes the following features:

i) An aggregate supply equation links real output to inflation at the country level. The slope of the supply

⁴ Sánchez (2006c) obtains the same conclusions for the aggregate supply shocks in a multi-country approach. Moreover, exogenous factors other than aggregate supply disturbances (such as policy those affecting aggregate demand, risk premia and the inflation objective) are found to play the same role as the present sectoral productivity shock. For an application of such multi-country framework to the analysis of monetary union prospects in East Asia, see Sánchez (2006b).

schedule is normally seen as being positively related to the degree of openness of the economy: for a given real exchange rate depreciation associated with output expansion, the inflationary effect is larger the more open the economy is (see e.g. Romer, 1993). That is, a more open economy displays a steeper supply curve.

ii) Real exchange rates are driven by sectoral productivity shocks. This can be interpreted as a Balassa-Samuelson effect, through which higher productivity growth in tradable goods production compared to non-tradables induces a real appreciation.

iii) Welfare comparisons involve consideration of monetary authorities for both the currency union and a given reference country. Both authorities care about relevant deviations of output and inflation from desired levels. In the union's monetary policy case, what matters are deviations of aggregate output and inflation resulting from using country sizes as weights.⁵ Under monetary autonomy, a country's nominal exchange rate may fluctuate.

iv) Shocks may affect countries in the same way ("common" shocks) or be country-specific. In the latter case, two situations are considered, depending on whether disturbances hit just one country ("idiosyncratic" shocks) or hit both countries in opposite directions ("asymmetric" shocks).

Welfare implications of joining a monetary union

Two types of welfare implications can be drawn from the analysis conducted here. First, the situation of a given economy under currency union participation is

⁵ In the present context, it is convenient to define size as the share of a given participating country in the currency union's economy.

Welfare analysis requires consideration of relevant cross-country structural differences

compared with that under autonomous monetary policy. Second, the single monetary policy's stabilisation properties are also assessed against the monetary autonomy scenario.

Under both welfare analyses, the benchmark is thus given by autonomous monetary policy. This suggests that there is an important difference between aggregate supply and sectoral productivity shocks. National monetary authorities are only concerned with an exogenous shift in aggregate supply, that alters their choice of inflation and output. Their loss function is unaffected by sectoral productivity disturbances. Instead, either shock type influences both monetary union performance and the welfare of participating countries. The reason is that the single monetary policy is not only concerned with aggregate supply shocks, but may also be affected by sectoral productivity shocks potentially entailing an additional inflationary impact.⁶

How are the single monetary authority and member states affected by sectoral productivity shocks?

Unexpected developments in sectoral productivity fail to affect welfare under monetary autonomy. The currency union's policymaker would also be spared if participating countries had the same output-inflation trade-off and/or if they were hit by the same shock. Otherwise, a sectoral shock will worsen the choices available for stabilisation under the currency union. To see this, consider, for example a sectoral shock hitting only one country or both countries in different directions. Any of the two countries would prefer the single monetary policy to remain unchanged. However, the latter must react to partially offset the shock. Therefore, the sectoral disturbance implies that both the monetary union's policymaker and each participating country are outperformed by the alternative of monetary autonomy. The scenarios of country-specific shocks analysed here make the difference, and the currency union is thus dominated by autonomous monetary policy under sectoral productivity disturbances. Welfare considerations are clear-cut in the latter case. In particular, they do not necessitate consideration of parameters such as size and openness which do play a role under aggregate supply shocks.

What is the role of size and openness under aggregate supply shocks?

When economies are hit by aggregate supply shocks, both the currency union and the autonomous policymaker are confronted with a worse choice between output and inflation. If the two countries exhibit the same supply curves, monetary union makes no difference to individual countries. Otherwise, the analysis is somewhat more complex, involving in particular a discussion about size and openness. Let us now turn to these welfare considerations.

Consider first an aggregate supply disturbance of the idiosyncratic or asymmetric type. In either case, the shock facing the currency union's policymaker is of smaller magnitude than under the alternative autonomous monetary arrangement. That is, the latter is outperformed by the union's policy. Of course, the mirror image of this is that countries should adjust to shocks hitting them by more than would be the case with the help of domestic stabilisation tools. In the remaining case of common supply shocks, welfare considerations are not that clear-cut. Which monetary arrangement dominates its alternative depends on the slope of the reference country's supply schedule. If the latter is steep, that is, if the country enjoys an unfavourable output-inflation trade-off, monetary union is the best option.⁷ Monetary autonomy instead outperforms its alternative for countries with flat supply curves. Given that a steep supply curve is associated with high trade openness, one corollary is that currency union performance is enhanced against the alternative of an open economy operating under monetary autonomy.

This discussion suggests that, contrary to the adverse welfare implications of sectoral productivity shocks, monetary union exhibits much better stabilisation properties under aggregate supply disturbances. Instead, both types of shocks entail stabilisation costs for member states. As a result, countries are expected to join a monetary union insofar as the latter entails strong favourable effects, as given for instance by a rise in trade flows and potential credibility gains. In this context, it is worth estimating the likely effect of size and openness on monetary stabilisation costs implied by monetary union membership under aggregate supply shocks. Table 3 presents estimated welfare changes due to an increase in size

⁶ As mentioned above, in a richer model aggregate demand or risk premium shocks would play a comparable role to that played here by sectoral – as opposed to aggregate – supply shocks.

⁷ A steeper supply curve (open economy) is known to entail monetary stabilisation costs since a supply shock makes the deviation of inflation from target larger for a given change in the output gap.

Sectoral productivity shocks pose a challenge for monetary union stabilisation

Table 3
Estimated welfare effects under monetary union participation

	1% larger country size	1% steeper supply curve
Common shock	12.8	6.3
Asymmetric shock	0.0	3.6
Idiosyncratic shock	1.7	2.0

Note: The entries in this Table are percentage changes in welfare relative to autonomous monetary policy in the event of aggregate supply shocks.

and a steeper supply schedule (as induced by a higher degree of trade openness), in both cases evaluated at baseline calibrated values. Both parameter changes appear to alleviate stabilisation costs.⁸ This implies that the assessment of the likely consequences of euro adoption for small open EU NMS economies would be mixed. While their high degree of trade openness reduces stabilisation costs from joining the euro area, small size favours the use of national monetary policy.

Externalities, endogeneity and dynamic considerations

Two externalities involved in currency union enlargement are worth discussing. First, as new countries join, the economic weight of existing member countries declines. The results discussed earlier in this section would point to an across-the-board welfare loss in this case. Second, already participating states may now occupy a different ranking in terms of openness and thus the output-inflation trade-off. Focusing on enlargement to EU NMS, it is worth stressing that a substantial fraction of their trade is with the euro area. This means that, despite EU NMS being very open to trade, the latter's geographic composition implies that their participation need not make the old members' supply curve flatter compared to the enlarged union. Therefore, it is only the first, size-related externality that appears more likely to raise stabilisation costs to former members from ongoing euro area membership. However, the magnitude of such costs would be bounded by the size of the new entrants, with EU NMS altogether amounting to some 7 percent of a hypothetical enlarged euro area real GDP. The effect would naturally be stronger if other economies were to join as well.

⁸ The result that size does not matter under asymmetric shocks simply stems from the latter being defined to exactly offset each other at the union's aggregate level. The magnitude of the shocks in each country thus adjusts to changes in the relative size of both economies, with fully neutral welfare consequences.

Some important economic developments may be endogenous to monetary union, as examined by Frankel and Rose (1998). One such development is the enlargement-induced rise in overall trade. Stronger trade integration has no very clear implications for the distribution of shocks within the union. It could make business cycles more synchronised, but it might as well lead to specialisation and thus

increase the likelihood of country-specific shocks (Kalemli-Ozcan et al., 2001). Neither do overall increased trade interactions have clear implications in terms of the role of openness discussed above. This analysis shows that openness reduces a given country's stabilisation costs from monetary union membership. However, this does not necessarily carry over to the case where all members trade more, which does not by itself translate into a change in any of the countries' output-inflation trade-offs relative to the union's average.

Finally, it is worth looking at some dynamic considerations. EU NMS evolve through a catching-up growth process, their size being projected to rise over time in comparison to other EU countries. For an expanding euro area, changing relative sizes would point to a zero-sum game in which stabilisation costs are redistributed across participating countries. Again, the importance of this effect is constrained by the combined size of catching-up economies joining – the only difference here being that one should factor in these countries' increasing economic weights over time.

Conclusion

This article discusses monetary union stabilisation, with a focus on structural aspects that are expected to exert an influence on the euro area enlargement process. In particular, consideration of (common and country-specific) shocks is combined with the analysis of the likely role of country size and trade openness.

Monetary union performance depends on structural factors, including the type and cross-country distribution of shocks hitting participating states. Sectoral productivity disturbances pose a challenge to the single monetary policy. The latter displays a much bet-

Inclusion of catch-up countries may raise the stabilisation costs facing old members

ter performance under aggregate supply shocks compared to a small open economy operating under monetary autonomy.

Euro area enlargement currently hinges on the entry of new EU member states that are small open economies. These countries' decisions on monetary union participation involve a comparison of favourable trade and credibility considerations with stabilisation costs implied by foregoing monetary autonomy. Size and openness weigh on such stabilisation costs, with the outcome failing to be clear-cut. New member states' small size makes a currency union less appealing as it limits their role in the single monetary policy. In contrast, trade openness lowers costs related to euro adoption indirectly by inducing the domestic output-inflation trade-off to be less favourable. New member states' participation in the euro area would also have an influence on the countries that have already adopted the single currency. Likely trade-enhancing effects could also be accompanied by a number of externalities and dynamic impacts. One such extra effect on current euro area participants would be a reduced share in the enlarged monetary union. The potential stabilisation costs involved by this are, however, constrained by the rather modest size of the new entrants.

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