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ABSTRACT

On the Way of EMU Enlargement towards CEECs: What is the Appropriate Exchange Rate Regime?*

Focusing on a very rich panel of exchange rate regimes in transition countries, this Paper asks the question of the appropriate exchange rate regime for countries aiming at joining the EU, that is, subsequently, the EMU. Four arguments plead in favour of the adoption of a fixed exchange rate regime: (i) countries sharing the same currency inside a Currency Union (CU hereafter) trade well above the average, because of lower transaction costs; (ii) emerging countries are not able to manage counter-cyclical policies; (iii) in a world of increasing financial instability, only corner solutions are feasible; (iv) last, but not least, fixing CEECs' currencies could be a necessary step in a global strategy of entering the EU, that is, subsequently, the EMU.

This Paper examines the first of these four arguments, that is, the fostering of trade, and provides evidence that the extra trade implied by fixing the currency is in fact close to nil, as in Padko and Wall (2000). One corollary is that the benefit from membership into the EMU, if any, cannot be explained by the transaction cost argument only. Besides fixed effects, the explanation of the level of trade integration is to be found in the external constraint. The latter is affected by trade (positively if intra-industry trade dominates), and by monetary and fiscal policy. Increasing government spending and manipulating the exchange rate or moving towards more floating regimes might make business cycles more symmetric, relax the external constraint, and finally favour further trade integration.

Given that the co-variation of East-West business cycles is already dominated by intra-industry trade, one can conclude that joining the EU, and two years later, the EMU, is realistic and compatible with any exchange rate regime. Empirical evidence from transition countries shows that the exchange rate regime is not correlated with any fundamentals – better macro-economic performance, higher growth, or deeper trade integration – and should not allow for discrimination between candidate countries for entering the EU (as for other nominal criteria).

JEL Classification: E32, F30 and F42
Keywords: business cycle, EU enlargement, gravity equation and transition

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Introduction

A set of alternative conditions must be fulfilled for a Currency Union (CU hereafter) to be sustainable: labor mobility must be high, wage and prices flexible, or budgetary transfers must be able to re-distribute wealth in case of asymmetric shocks. In the case of an enlarged Europe including Eastern countries, labor mobility is as low as within EU core countries, prices are supposed to be rigid, and fiscal transfers limited in the framework of the Maastricht Treaty. Last but not least, the degree of symmetry of shocks, which is already low enough among EU member countries, is even lower between East-West countries[3]. Nevertheless, low today does not imply low tomorrow, after achieving monetary unification. The structural break following the enforcement of monetary unification is at the core of the well-known Lucas critic, which argues that the way the criteria are fulfilled is likely to be modified after achieving the CU. In other words, one cannot assess *ex ante* the Optimal Currency Area (OCA) criteria, because the mere fact of entering a monetary union influences the way those criteria are satisfied.

A degree of symmetry not large enough might discourage currency unification, while the very existence of a currency union affects the degree of symmetry of shocks. There is a large debate, initiated by Frankel and Rose [1998] and Rose [2000], on the issue whether asymmetry fosters trade integration or not, and *vice versa*. Rose [2000] shows that (i) membership in a currency union increases trade by a factor of three, while Frankel and Rose [1998] demonstrate that (ii) the higher the degree of trade integration, whether specialised or intra-sector, the higher the co-variation of economic cycles. If entering a monetary union according to (i) favours trade integration, this in turn according to (ii) makes symmetric shocks more likely, thus reinforcing the very sustainability of the CU. However, these findings are based mainly on empirical grounds, and contradict the argument[4] that specialisation should increase the probability of asymmetric shocks.

Recognising that the focus on the supply side might well have been overemphasised, Flandreau and Maurel [2001] analyse the impact of monetary arrangements on trade integration and business cycle correlation in a more comprehensive framework. Focusing on

[3] See Fidrmuc [2001] for an assessment of labor mobility in Eastern Europe, Bayoumi and Eichengreen [1993], for the low symmetry of EU shocks, and Horvath [2001] for the even lower symmetry of East-West shocks.
[4] See Krugman [1992], Kenen [1969], and Eichengreen [1993].

late 19th century Europe, they formalise the demand forces induced by co-ordination of public policies alongside the specialisation forces. By this means, they are able to isolate the negative impact of trade integration on business cycles via the specialisation channel, but this negative impact is overcompensated by the positive impact of public policy co-ordination. And as a result, the net effect of a CU on trade integration[5] is positive. The emphasis is put on the hypothesis that a monetary union is more than an area of no exchange rate variability[6] and no protection. The Austro-Hungarian Empire was a zone where the tightening of credit conditions was transmitted through the two parts of the Empire extremely rapidly, and where the two parts were tied up by a tacit pact of stability and fiscal discipline. Further, while Austria was specialised in Industry, Hungary was predominantly agricultural, which is not far from the actual pattern we observe between, say, Germany, and Poland, or Romania.

These results are of great interest for the purpose of EU Enlargement, and allow to put forward two hypothesis. The first hypothesis is that a CU is more than an area of no exchange rate variability and fixed exchange rate, and this can be tested directly, using the wide range of exchange rate regimes over the nineties and across European (including Eastern European) countries. The second is that East-West monetary and financial integration, despite the likelyhood of trade being specialised, will be able to increase the symmetry of shocks. Finally, if we replicate the Flandreau and Maurel's paper policy implication to CEECs and conclude that demand forces might be able to compensate the increase in supply shocks, specific to the sector in which countries are specialised, 'this is great news for the purpose of EU enlargement'.

This kind of endogeneity of OCA criteria is key in assessing the optimal exchange rate regime for transition countries, who aim at entering the EU, that is, eventually, the EMU. Koen Shoors [2001] argues that pegging the currency (and eventually adopting the euro) is optimal for two groups of countries: those for whom the benefits from stabilisation largely exceed the cost of loosening their monetary policy; and those for whom the convergence process is sufficiently achieved to bring the degree of symmetry of business cycles close enough to a critical level[7]. At intermediate levels of restructuring, as long as the process of increase in productivity gains continues, CEECs have the option of keeping their own currencies. The

[5] That is the net effect of increased specialisation and increased co-ordination of public policies (simultaneous increase or decrease in public spending and/or the manipulation of exchange rate).
[6] Like the gold standard, the modern equivalent of a currency board.

huge estimate of EU extra trade in Rose (2000) suggests that fixing the currency has a twofold effect: not only does it entail a significant cut-off in transaction costs, but it also significantly increases the degree of market integration while decreasing that of market imperfections. This second consequence stems from the adoption of the monetary component of the *Acquis Communautaire*, that is strictly defined monetary and fiscal rules as well as informal ones (such as the stability pact, or the ECB inflation target). The question of joining the EMU as soon as possible, even for these intermediary countries, is then worth asking.)

The nineties have been characterized by a continuous increase in West-East integration. Catching up of trade flows to levels in line with the gravity potentials are well documented in the literature[8], but what is less known is to what extent monetary integration was achieved: section 1 reviews the various monetary arrangements prevailing in the region up to now, from currency boards for stabilisation purposes, to more flexible exchange rate regimes, floating or crawling pegs and bands. It emphasises the great diversity in exchange rate regimes all over the period, which allows to test, in section 2, whether the channel through which a CU fosters trade integration is simply the cut-off in transaction costs. The answer is negative: we observe that both floating and fixing enhance trade. Section 3 provides an analysis of the causality running from policies aimed at relaxing the external constraint to trade integration. In section 4 we estimate an equation where the degree of symmetry of business cycles is explained by both trade integration (in line with the specialisation argument), and monetary integration, measured through exchange rate variation[9] and/or government spending[10]. The main policy implications regarding the EU enlargement towards East are drawn in the Conclusion. .

Section 1: Eastern monetary arrangements in the transition process

Despite the current diversity in exchange rate regimes among transition countries (see table 1), "in no case the economic fundamentals point unambiguously in one direction as regards the regime choice". CEECs have made considerable progress in establishing fairly low levels of exchange rate variability (insert table 2) and low inflation (insert table 3). Nominal

[7] Above which entering the monetary union gives up benefit.
[8] See Hamilton and Winters [1992], Baldwin [1994], Van Beers and Biessen [1996], Cheikbossian and Maurel [1998].
[9] Which, by making business cycles more symmetric, relax the external constraint, as argued in Brada and Mendez [1988].
[10] Which dampens the negative impact of an adverse (supply) shock

exchange rates are quite stable, and standard deviations accordingly rather low. If we except Romania and Bulgaria[11], in other countries, inflation rates are often two-digit, well above the levels required by the Maastricht criteria, except for the Baltic States, the Slovak republic (to a lesser extent in the recent years), Slovenia, and the Czech republic, where it is one-digit. Furthermore, the trend is that of a decrease in inflation, from 28,2% in 1995 in Hungary, to an estimated 10,1% in 1999. It is worth noticing that while the average inflation in euroland is 1,4% in 1999, and the best three EU countries averaged 0,6%, the figures for the Baltic States reveal very low inflation levels, by historical EU standards (3,3%: Estonia; 2,4%: Latvia; and 0,8% Lithuania). For the years 1998, 1999, and 2000, the European Transition Countries average respectively 8,7%, 5,3% and 6,4%.

Given the willingness of many CEECs of joining euroland, the question of the appropriate exchange rate regime deserves particular attention. Different views are competing. In a recent IMF Policy Discussion Paper, Anne-Marie Gulde et al. [2000] argue that currency board arrangements have favoured low inflation and higher growth. Furthermore, satisfying by definition the Maastricht criteria of no exchange rate variability and low inflation, currency boards may serve the way up to the adoption of the euro. Instead, Robert Corker et al. [2000] emphasise the risk of speculative attacks at the eve of joining the euro area. Any exchange rate regime is feasible, from currency board to any more flexible exchange rate arrangement, but again the condition *sine qua non* is to be credible and sustainable in an environment of likely "large capital inflows and asymmetric shocks". Finally the bipolar view says that in a world where countries have a large access to international markets and where capital moves freely, only two options are sustainable, flexible exchange rate and fixed exchange rate, both meaning a commitment to give up altogether an independent monetary policy. Whether this view is supported by empirical evidence is a matter of controversies. For Paul Masson [2000] there is no statistical evidence that the number of transitions from intermediate exchange rate regimes towards polar ones is increasing over time, and this turns out to be particularly true for Transition Countries over the nineties, where the major (and recent) moves are towards an increasing number of intermediate regimes. Among CEECs (Czech Republic, Estonia, Hungary, Poland, and Slovenia), there is one currency board (in Estonia), and three moves from less flexible exchange rate arrangements towards more flexible ones(in the Czech

[11] In these two countries, stabilisation is far from complete. Inflation mainly reflects the monetary financing of the deficit. For Bulgaria, the data clearly show the 1997 hyperinflation process, which ended up with the

Republic, Hungary, and Poland). Romania and Slovakia moved from tightly managed to relatively free float, while Bulgaria, for stabilisation purposes, implemented a currency board (see table 1). This diversity of exchange rate regimes in Central Eastern Europe is emphasised in a recent work by Agnès Bénassy-Quéré and Benoît Coeuré [2000], who argue that once the regional dimension is accounted for, there are more than two corner solutions. The authors emphasise that the perspective of a monetary union in the long run can make intermediate regime more robust in the meantime, and that these regimes must be managed through co-operation and economic policy co-ordination.

The main challenge for CEECs is to make the strategy of entering the EU compatible with the catching-up process. These two objectives might turn out to be contradictory: joining the EU imposes low inflation and exchange rate variability, while higher than EU average growth implies higher inflation and exchange rate variability. Hence the very restructuring process would justify a monetary policy and exchange rate policy aiming at accommodating the adverse consequences of real appreciation and inflationary pressures[12], and would exclude participating into EMU in a near future (CEECs would have better to wait up to the uncertain date when the process of restructuring is over). A recent paper by Coricelli and Jazbec [2001] provides evidence that this widespread belief is overstated. The real exchange rate behaviour is well influenced by structural reforms[13], at least at the beginning of transition, but this influence diminishes through time, and finally stabilises around the fifth or sixth year. "For several Central and Eastern European countries in the process of accession to the European Union, the dynamics of the real exchange rate can now be assimilated to that of previously acceding countries such as Spain, Portugal, and Greece, with the Harrod-Balassa-Samuelson effect playing a dominant role at later stages of transition".

Another argument bordering on the above Balassa Samuelson effect is that the probability of asymmetric shocks might be still high, requiring the use of an independent monetary and exchange rate policy. But if, following again Coricelli and Jazbec [2001], we assume that the influence of asymmetric shocks imputable to restructuring is over, then the question is to

implementation of a currency board. In Romania, the prices were still regulated until 1996, when liberalisation resulted in a jump in the inflation rate.

[12] Productivity gains in the tradable sector implying inflation in the non tradable sector through the Balassa Samuelson effect.

[13] These are measured by the ratio of the workers employed in manufacture on the number of workers employed in services, and instrumentalised by the well known structural reform index of De Melo, Denizer and Gelb [1996] and total credit to the private sector (EBRD Transition Report, 1999).

know whether the cost of accommodating higher inflation and productivity gains by labour and price flexibility outweighs the benefit of being a member of the EU currency union (the same question was asked for Mediterranean countries when they were candidates). In Boone, Maurel, and Babetski [2001], it is shown that the nineties have been characterised by an increase in the symmetry of supply and demand shocks in the EU and Transition Countries : hence the cost of giving up monetary independence is decreasing. Fidrmuc and Schardax [2000] suggest that the explanation of this increase in the symmetry of shocks lies in the pattern of trade (increasingly intra-industry).

To summarise, the choice of the exchange rate regime does not seem to have been determined by any particular economic situation: the wide range of exchange rate regimes is not correlated with any fundamental[14]. Furthermore, CEECs often tried to manage their currency in order to be in compliance with Maastricht criteria, even if the latter were not formally required for the countries under consideration. A strong argument for explaining this compliance can be found in a recent paper by Gomulka [2001], who recalls that joining EU means subsequently participating into EMU. Therefore once they enter the EU, countries are left with the following three options: fix the currency at the price of an increase in unemployment and painful macro-economic adjustment, let short-run and long-run capital flow in at the risk of increasing financial instability, or join the EMU as soon as possible. It is clear for the author that the benefit from joining a CU far exceeds the cut-off in transaction costs: he clearly states that it comes not only from budgetary transfers from the West, but also from the possibility of facing lower interest rates without raising uncertainty and increasing risk of speculative attacks[15]. In other words, joining EMU would imply avoiding the difficult trade-off between on the one hand low interest rates but increasing financial vulnerability and high interest rates but increase in unemployment on the other.

In the remainder of this paper we focus on another channel: what would joining the EMU imply on the process of trade integration, and on the degree of economic symmetry? In a spirit similar to that of Frankel and Rose [2000], who provide evidence that the beneficial effects of currency unions on output per capita do not come from a commitment to non-inflationary monetary policy, but from the promotion of trade, we show that the benefit from

[14] The only exception is maybe that of currency boards, associated with both higher growth and lower inflation.
[15] The financial gain is that emphasised in Flandreau and Maurel [2001].

a CU would not come from a reduction in transaction costs, but from an increase in both trade integration and business cycle co-variation.

Section 2: Assessing the impact of monetary arrangements on trade intensity

Rose [2000] argues that membership in a monetary union is likely to increase internal trade by a factor of three[16]. This huge amount of extra trade suggests that the benefit from joining the EMU exceeds the one resulting from the mere decrease in exchange rate volatility, thus departing from a long tradition that claimed that the creation of a monetary union is *per se* good for trade because of the mere reduction in transaction costs[17]. For testing the latter, namely that the benefit from a CU goes far beyond the transaction cost reduction, we consider the strict definition of a CU: an area of no exchange rate variability and fixed exchange rate.

Our empirical strategy is based upon the well-known gravity equation. Usually one measures the impact of memberships into EMU through a dummy variable set equal to one when both partners are EMU member countries. But this procedure is likely to overestimate the impact of a CU, by not taking into account non observable variables, like cultural, linguistic, and historical ties. By contrast we rely in this paper upon a rich panel characterised by a very large fluctuation of exchange rate regimes across countries and over the nineties. Therefore, the focus is on changes from one exchange rate regime to another, which, according to the literal transaction cost argument, should translate into more or less trade integration. In other words, using within estimators, we estimate a gravity equation where the impact of a CU is measured through changes in exchange rates regimes and exchange rate volatility, while at the same time the panel structure of the data-set eliminates any bias occurring from omitted (time-invariant) variables and which could "pollute" the exchange rate variables estimators. Our methodology is similar to that of Pakko and Wall [2001], who re-estimate the Rose's equation using the same dataset but running within estimators; the result, in sharp contrast with that of Rose, is that countries entering or leaving a CU do not trade more that other countries in the sample.

[16] This very high figure has been very much debated: see Pakko and Wall [2001], Flandreau and Maurel [2001], and Peerson [2001].
[17] See Flandreau [2000] for a review of the transaction costs argument in the 19th century.

According to the gravity equation, bilateral trade depends upon a variety of "structural" factors, among which are both nations' market size, measured by their national products. The gravity equation provides a natural benchmark to which a number of other explanatory variables can in turn be added. In this paper two sets of additional variables are taken into account. One set is made of monetary variables, whose effect on trade we seek to measure. The second set is made of trade protection, synthetically measured by the *economic freedom* index[18]. In practice the following basic specification is used:

Trade intensity (ij,t) = a1*prot_imp (ij,t)+ a2*prot_exp (ij,t)+ a3*vol(ij,t) + a4* erk(i,t) +a5*erk(j,t) + a6*cons + u(ij) + v(ij,t) (Equation 1)

where bilateral trade intensity (natural logarithm of imports of country i from country j divided by the product of both gdp) depends upon:

prot_imp (*prot_exp*) is a composite index varying from 0 (which corresponds to the highest level of protectionism) to 10 (highest level of freedom). This index comprises 21 components designed to identify the consistency of institutional arrangements and policies with economic freedom in seven major areas: size of government, economic structure and use of market, monetary policy and price stability, freedom to use alternative currencies, legal structure and security of private ownership, freedom to trade with foreigners and freedom of exchange in capital markets[19].

vol, the bilateral exchange rate volatility, calculated as the standard deviation of the logarithm of the rates of change[20]. Exchange rate volatility is not necessarily correlated negatively with trade flows: it can be seen either as an additional transaction cost or as a way of absorbing asymmetric shocks, and the sign of the correlation is a matter of empirics[21].

erk(i,t) is set equal to one (two, three) when the exchange rate regime is fix (intermediate, and floating). We use three indicators, hence k varies from 1 to 3[22].

[18] Data can be found at the following address: http://www.freetheworld.com/
[19] The methodology is described in any Annual Report of Economic Freedom of the World.
[20] We also considered, as an alternative volatility measure, the ratio of the standard deviation of the monthly exchange rate over its yearly average. Results do not vary qualitatively and are available from the author.
[21] See IMF [1984] estimation of 42 gravity equations, where exchange rate volatility has a positive influence on trade in 26 cases (for a total of 42); Brada and Mendez [1988], who assert that the manipulation of exchange rate fluctuations by relaxing the external constraint favors trade; and finally Meissner [2000],who estimates gravity equations in the last century and finds a positive coefficient for a sample of European and non European countries.
[22] These data are available on Rose's web site: http://www.haas.berkeley.edu/~arose/RecRes.htm.

Alternatively we can use two dummy variables, *floati* (*floate*) and *fixi* (*fixe*), set equal to one when according to the currency is floating (fixed).

The sample consists of 15 European countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United-Kingdom) plus the CEECs, the three Baltic States, and Russia, from 1990 to 2000. The large size of the panel (despite some limitations on unobservable bilateral flows) provides a basis for consistent estimation and the inclusion of a large number of explanatory variables. Fixed effects are included as indicated in equation 1, which as a result does not include the traditional distance variable used as a proxy for transaction cost, and excludes as well all time-invariant variables (geography in its broad sense, including distance, adjacency, linguistic and cultural ties, memberships towards EU). Bilateral trade flows, in millions constant dollars[23], come from the FLUBIL dataset. Gdp and exchange rate data come from IMF and OECD datasets.

Table 4: Gravity equation as in Rose [2000]

Specification:	I	II	III	IV
	Inte[a]	Inte2[b]	Inte[a]	Inte2[b]
Prot_imp	0.35***	0.81***	0.31***	0.74***
Prot_exp	0.14***	0.40***	0.15***	0.43***
Vol	-1.18***	-1.73***	-1.23***	-1.99***
Er3i	-0.02**	-0.33		
Er3e	-0.04	0.00		
Fixi			0.048***	0.065
Fixe			0.158***	0.28***
Floati			0.102***	0.18***
Floate			0.053***	0.086**
R2	0.1510	0.1983	0.1220	0.1617
N	5542	5542	6693	6693
F	169	236	116	161

[a]: Inte = bilateral trade divided by importer's and exporter's gdp product, in logarithm
[b]: Inte2 = squared bilateral trade divided by importer's and exporter's gdp product, in logarithm

The results in columns I and II provide very interesting insights. As expected, more freedom implies a higher level of trade intensity: the coefficients of both economic freedom variables are positive. Exchange rate variability influences bilateral trade flows negatively.

More importantly, exchange rate regimes significantly influence trade. The coefficient of *er3i* is negative and significant, which means that moving towards more exchange rate stability tends to increase trade intensity. What is puzzling is that the coefficient is significant

[23] Provided by Le Gallo Françoise (INSEE, France), to whom I am extremely grateful.

only from the importer side, not very robust (it is not significant at the usual 5% level), and its significance disappears if we substitute *er3* by other proxies *erk* for the exchange rate regime.

It could be that both fix and floating currencies are associated with more trade, hence the increase in trade induced by moving towards more stability turns out to be low. We therefore introduce separate dummy variables set equal to one when the importer's (exporter's) exchange rate regime is fixed or when the currency is floating (columns II and IV). Results now contradict the widespread opinion that fixing the currency produces an extra trade, above the sample average. Somehow surprisingly, both (extreme) exchange rate regimes enhance trade.

Explaining this apparent paradox is the aim of the following sub-section. But we can already argue that, from the extreme variety of exchange rate regimes in the sample, one cannot infer that countries that have fixed their currencies recorded a deeper integration with their Western partners. Secondly, memberships into a CU is likely to entail a number of other factors, alongside with the cut-off in transaction costs, which explain the above average trade integration.

Our findings are in sharp contrast with past empirical studies which interpret the link between memberships into a CU and trade as an evidence of the great impact that the simple fact of sharing the same currency would have on trade integration. The most widely quoted is that of Rose [2000], concluding that "two countries sharing the same currency would trade three times as much as they would with different currencies", although this extra trade is not imputable to the mere reduction in the volatility of exchange rate which is controlled for by the procedure. Rose therefore concludes that fixing the currency implies a reduction in transaction costs well above the mere reduction in exchange rate volatility.

Beyond this simple reduction in exchange rate volatility, there are notably the fixed effects, correlated to bilateral trade flows and the monetary union dummy, that imply estimation bias if ignored[24]. Our procedure (within estimators) allows to control for those cultural, geographical, and historical factors, specific for each trading pair, and to properly estimate the effect of any movement from one exchange rate regime to another (more fix), net of these

[24] In other words, OLS mistakenly attribute a correlation between trade and a common currency area to a direct link between the two variables, rather than with the unobserved attributes. One should recognise that for controlling for these time invariant variables Rose introduces several particular factors: common first language, French overseas department, colonies with the same colonizer after 1945, member of a free trade area. But the number of these particular variables stands far below that of fixed effect specific to each trading partner!

specific effects. As in Pakko and Wall's paper [2001], whose advantage is to measure *directly* the effect of entering or leaving a CU, we do not find any evidence that a CU *stricto sensu* (that is defined as an area of no exchange rate volatility and fixed exchange rate) might explain the trade creation effect. The fragility of Pakko and Wall's result is that it relies on a very small number of countries showing a change in common-currency status (of the nearly 23 000 observations, only 7 have a change). Our approach, by considering, in an almost caricatural way, that a CU is simply a set of countries having fixed their currencies, is far from ideal; nevertheless it has the advantage of relying upon more observations.

To summarize, we agree that membership in a currency union (like EMU) is likely to entail a lot of unobserved factors, not only the fact of fixing the currency, which produce a trade above the sample average by a factor of three. These factors include the fixed effects controlled for by the within procedure, but also the fact that CU members external constraint is less binding than for the remainder of the sample. We focus on this latter argument in the following section.

Section 3: the role of the external constraint

The adoption of a more or less fixed exchange rate regime in a country having close ties with its neighbours and increasingly integrated into the world market depends upon a large set of factors, including notably the impact of the external constraint in trade reduction. Suppose that economic growth is higher in one of two trading partners (that is, there is some degree of asymmetry). Then the faster growing country is left with the following options: currency devaluation (in case of fixed exchange rates or peg)[25], or increase in unemployment, which in turn has a negative impact on trade flows, that is on external demand and supply. On the contrary, if economic growth is the same in both countries, then the external constraint does not bind and there is no limit to trade expansion. Hence the degree of symmetry of business cycles can be expected to be positively correlated with bilateral trade.

It is easy to understand that the correlation of business cycles is in turn correlated with the choice of a given exchange rate regime. More "symmetric countries" will tend to fix their currency, and "asymmetric" countries are likely to opt for a floating exchange rate regime. In both cases, the significant estimates of exchange rate dummies in equation 1 mirror the

[25] Or depreciation, in case of floating.

impact of the external constraint on bilateral trade intensity: by floating and/or manipulating their exchange rates, asymmetric countries relax their external constraint, while symmetric countries which do not face this external constraint are *de facto* more trade integrated and can fix their currencies. In both cases, floating and fixing generate an extra trade.

For testing the relevance of this explanation, we augment the gravity equation with *Corr(ij,t)*, which is the correlation between residuals, from regression of log monthly indices of industrial production[26] on a time trend plus constant. Proceeding that way, we are able to properly estimate the effect of the exchange rate regime and that of the exchange rate volatility, if any, *net of that of the external constraint*. Furthermore, the procedure allows to interpret more convincingly exchange rate volatility and exchange rate regime as proxies for transaction costs.

Table 5: Augmented Gravity equation; within estimators

	Number T of months in corr(ij,t): 48				Number T of months in corr(ij,t): 60			
	Inte[a]	Inte2[b]	Inte[a]	Inte2[b]	Inte[a]	Inte2 [b]	Inte[a]	Inte2 [b]
Prot_imp	0.29***	0.71***	0.24***	0.62***	0.30***	0.72***	0.25***	0.62***
Prot_exp	0.18***	0.51***	0.20***	0.55***	0.19***	0.52***	0.20***	0.55***
Vol	-0.86***	-1.51**	-1.17***	-2.20**	-0.55	-0.97	-0.91**	-1.76**
Er3i	-0.03*	-0.06*			-0.02	-0.04		
Er3e	-0.026*	-0.04*			-0.02	-0.03		
Fixi			-0.00	-0.01			0.00	-0.00
Fixe			0.17***	0.30***			0.20***	0.37***
Floati			0.07**	0.12***			0.07**	0.12**
Floate			0.02	0.02			0.027	0.03
Corr	0.14***	0.28***	0.12***	0.19**	0.22***	0.46***	0.19***	0.35***
R2	0.1262	0.1821	0.1327	0.1840	0.1322	0.1870	0.1408	0.1896
N	3314	3314	3610	3610	2977	2977	3273	3273
F	63	98	56	82	61	92	55	79

[a]: Inte = bilateral trade divided by importer's and exporter's gdp product, in logarithm
[b]: Inte2 = squared bilateral trade divided by importer's and exporter's gdp product, in logarithm

Results are reported in table 5. In some cases, the magnitude of the exchange rate volatility estimate (in absolute value) decreases, supporting the assumption that in the equation without *corr(ij,t)* it was biased through the effect of exchange rate manipulations on trade intensity.

Furthermore, the significance of *erk* increases[27], meaning that converging towards a more stable exchange rate regime, by controlling for the external constraint impact on trade, is good for both import and export.

[26] The number N of months (around the year t) takes different values (for sensitivity analysis): 48 and 60, that is respectively four and five years. For a bilateral trade occurring in 1995, we compute the correlation of monthly indices of seasonally adjusted industrial production business cycles from 1993 to 1997: in that case N is set equal to 60.
[27] The significance of *fixi* and *floate* disappears, while that of *fixe* and *floati* remains but decreases.

Last but not least, the degree of symmetry influences trade. Sensitivity tests using different measures of cyclical co-variation (varying the time span) and two different measures of trade integration (inte and inte2) confirm that external constraint matters.

Section 4: Reversing the causality: trade influences symmetry

4.1 Model

Membership into a currency union increases bilateral trade above what would simply induce the reduction in exchange rate uncertainty, and *vice versa* trade integration is not neutral on the degree of symmetry of shocks. Endogeneity implies that entering a monetary union is likely to increase bilateral trade, but monetary unions are more likely to be observed between pairs of countries heavily integrated, in other words between countries for whom the pattern of trade flows is above the gravity sample's average. Technically speaking, endogeneity means that the positive estimate of the currency union dummy in the gravity equation is biased by the causality running from trade integration to the probability of being member of or entering a currency union.

The same applies to our approach: while external constraint (or the choice of a given exchange rate regime) influences trade, the external constraint itself is altered by the degree of trade integration, and more specifically, by the nature of trade. The impact of trade integration on the degree of symmetry of shocks depends upon the nature of trade: positive if intra-industry trade dominate, negative in case of predominant inter industry trade. A specialised trade means that countries outputs are concentrated in different sectors, therefore a sector shock, positive for one country, will be negative for its partner. Intra-industry trade mirrors similar production patterns. Hence similar shocks are more likely to occur between partner countries.

Suppose that business cycles can be represented according to the following decomposition (originally proposed by Frankel and Rose [1998]):

$\Delta y = \sum \alpha_i s_i + d$ (Equation 2)

$\Delta y^* = \sum \alpha_i^* s_i + d^*$ (Equation 2 bis)

Where asterix denote a foreign value. Business cycles are the sum of sector shocks weighted by the respective share of each sector i in both domestic and foreign economy (these shares may differ, but not the shocks themselves), and of demand shocks, like the increase or decrease in public expenditures (fiscal policy), inflationary measures not driven by productivity gains, devaluation aimed at improving short run competitiveness. In case of nominal inertia, these demand shocks might have a long lasting effect (see JCE, 2001).

From equations 2 and 2bis, one can derive the following formula:

$$corr(\Delta y, \Delta y^*) = \sum \alpha_i \alpha_i^* \sigma(s_i) + \sigma(d, d^*) \qquad \text{(Equation 3)}$$

This expression tells that the correlation of business cycles depends on countries specialisation, and on the co-variation of country-specific demand shocks. Countries specialisation can be naturally measured through the level of trade integration: if trade is specialised, meaning that countries productions are concentrated in different sectors, any increase in trade is likely to amplify asymmetry. On the contrary, if trade is intra-industry, countries produce and trade the same commodities, and trade integration may be expected to be positively correlated with the correlation of business cycles.

Turning to the demand side, suppose that economic growth is higher in one partner country (i.e. there is some degree of asymmetry) and that the currency is fixed, so the only way of accommodating the discrepancy in business cycles with the main trading partners is through budgetary and fiscal policy, for instance by varying the level of public expenditures. If the exchange rate regime leaves some room for more autonomy, then countries can face an asymmetric shock by manipulating exchange rates and/or moving towards an even more flexible exchange rate regime. In Flandreau and Maurel [2001], it is shown that ignoring the impact of public policies co-ordination might be wrong, by producing a positive or not significant correlation between trade intensity and co-variation of business cycles. In the more complete specification, initially proposed and validated by the authors (see equations 4 and 4b below), monetary and fiscal co-ordination in the various arrangements are shown to compensate the negative correlation between trade, specialised at the time, and business cycle symmetry[28].

[28] Focusing upon a more recent period of time Rose and Engel [2000] report the counterintuitive result that in a sample of industrial and developing countries, the correlation between trade intensity and symmetry is positive. It is likely that computing the partial correlation, that is adding the demand side variables, would restore the

In practice we estimate the following equations:

Corr(ij,t) = b1 + b2 * Trade intensity (ij,t) + b3* vol(ij,t)+ b4* erk(i,t) + b5*erk(j,t)
+ b6 * dgovi + b7 * dgove + u(ij,t) + v(ij,t) (Eq.4)

Corr(ij,t) = b1 + b2 * Trade intensity (ij,t) + b3* vol(ij,t)+ b4* fixi (i,t) + b5*fixe (j,t)
+ b6 * floati + b7 * floate + b7 * dgovi + b8 * dgove + u(ij,t) + v(ij,t) (Eq.4bis)

Where *dgovi* (*dgove*) denote the first differences in general government consumption (in percent of GDP), and serve as proxy for country specific demand shock.

b2 should be positive (negative) if intra trade dominates (if trade is specialised). It is expected to be be higher in the sub sample of EU countries, and lower for East West trade, whose intra trade share increases over the period but remains under EU average (see table 7).

Regarding monetary and fiscal policy variables (coefficients b3 to b8), one has to distinguish again two sub samples. For EU countries, the process of monetary integration implies that the tools for accommodating asymmetric shocks and addressing current imbalances are quite limited. If there is some room for increasing government spending in the 3% of GDP limits imposed by the Stability Pact, manipulating exchange rates is not at odds with EMU targets and ERM2 functioning. Of course, EU constitutes an already highly integrated market, within which those direct policy channels are largely amplified by at least two mechanisms. The first is the borrowing channel: higher integration capital markets, resulting from monetary integration, reduces credit market imperfections. A region can address asymmetric shocks by obtaining credit more easily from other regions within the currency union. The second channel is asset portfolio diversification: capital market integration enables participating states to diversify idiosyncratic risks. As a result[29], region specific productivity shocks are beneficial to union-wide income, because all other regions may hold claims on that part.

For CEECs, instead, both exchange rate volatility and increases in government spending can be expected to positively influence business cycle symmetry.

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expected negative correlation between a trade which is certainly specialised and a co-variation of business cycles.

[29] See Asdrubali Sorensen and Yosha [1996] as well as Mélitz and Zumer [2000].

4.2 Results

Results are reported in tables 6a and 6b. The impact of trade intensity on business cycles correlation is positive, whatever the sub-sample we are looking at (EU and East West trade flows). Inside the EU, the increase in trade is associated with a much higher increase in economic co-variation (by a factor of 2 up to 4). This reflects the fact that the share of intra-industry trade is predominant in EU trade but is still under EU average in East West trade, as shown in table 7.

Table 7: Intra industry Trade in 1993 (1999), percentage of total trade

	Year	Intra industry Total	Horizontal Intra Industry Trade	Vertical Intra industry Trade
EU-15	1993	51,2	14,0	37,3
	1998	54,7	13,7	41
France	1993	70,7	25,8	44,8
	1998	73,8	24,5	49,4
Poland	1993	22,6	4,8	17,9
	1998	31,9	6,3	25,5
Hungary	1993	28,3	3,6	24,7
	1998	46,4	7,4	39,1
Romania	1993	15,7	2,3	13,3
	1998	19,9	2,3	17,5
Czech Republic	1993	36,2	3,1	33,1
	1998	57,9	10,9	47,0
Greece	1993	14,1	2,1	12
	1998	15,3	3,0	12,3
Estonia	1993	2,5	0,2	2,3
	1998	27,5	5,8	21,6

Source : Vincent Vicard [2001] used the methodology described in Lionel Fontagné and Michael Freudenberg [1997], and computed the shares from data disaggregated at the 6-digit level.

The share of intra-industry trade in East-West flows increases, for example from 28% to 46% in the case of Hungary, which explains that an increase in trade integration mainly due to intra industry trade flows positively influences economic co-variation[30]. It should be recognised that our within estimators are based upon variation over time and disregard cross sectional variation. Hence the positive correlation between the left hand side variable and trade, reflecting that increase in intra industry trade, at the same time is likely to underestimate the impact the still high share of specialised trade in East-West trade flows

[30] Fidrmuc and Schardax [2001] also provide evidence that intra-industry trade explain convergence in business cycles.

might have on economic co-variation[31]. Another argument is that specialisation among integrating regions occurs within the industrial chain (see Fontagné and Freudenberg [1999]).

For EU sub-sample, where currencies are fixed, the only instrument available in case of asymmetric shock is fiscal policy. Indeed *dgov* elasticity turns out to be higher that between Central Eastern European and EU countries, while exchange rate volatility is not significant and floating not correlated with more business cycle co-variation.

By contrast, CEECs and EU countries external constraint is dampened by both increases in government spending and exchange rate volatility. The coefficient of *Vol* in all specifications is highly significant and positive; *dgovi* and *dgove* coefficients are also positive and significant.

[31] Between estimators are five times lower than within estimators; nevertheless they remain positive and significant.

Table 6a and 6b: Trade / monetary integration and symmetry

Number T of months in corr(ij,t): 48; Within estimators

	UE bilateral trade flows				East-West Trade flows				UE bilateral trade flows				East-West Trade flows			
Inte			0.15***	0.17***			0.07***	0.07***			0.16***	0.17***			0.07***	0.058***
Inte2	0.08***	0.09***			0.039***	0.039***			0.08***	0.09***			0.04***	0.028***		
Dogvi	0.014	0.029***	0.01	0.02**	0.001		0.00		0.03***	0.03***	0.03***	0.025**	0.00		0.00	
Dgove	0.033	0.021*	0.03**	0.01*	-0.005*		-0.005**		0.02**	0.02*	0.02*	0.018*	-0.005**		-0.006**	
Vol	0.79		0.42		1.07***	1.06***	1.06***	1.04***	2.41		2.12		1.05***	1.21***	1.04***	1.20***
Er3i	-0.06***		-0.06***		-.00	-0.00	0.00	0.00								
Er3e	0.047**		0.04**		0.01	0.02**	0.01	0.02**								
Fixi									0.02		0.02		0.00	0.02	0.00	0.02
Fixe									0.01		0.01		-0.00	0.00	0.00	0.01
Floati									-0.06**		-0.06**		-0.01	0.03*	-0.1	0.03
Floate									-0.01		-0.02		0.05**	0.05***	0.05**	0.05**
R2	0.0306	0.0179	0.0279	0.01556	0.0469	0.0445	0.0432	0.0406	0.0255	0.0179	0.0236	0.0156	0.0493	0.0342	0.0457	0.0337
N	1295	1295	1295	1295	1782	1782	1782	1782	1295	1295	1295	1295	1782	1946	1782	1946
F	5.7	6.61	5.17	5.72	11.30	16.04	10.35	14.57	3.53	6.61	3.27	5.72	8.91	9.08	8.22	8.94

Number T of months in corr(ij,t): 60; Within estimators

	UE bilateral trade flows				East-West Trade flows				UE bilateral trade flows				East-West Trade flows			
Inte			0.17***	0.20***			0.07***	0.07***			0.20***	0.21***			0.07***	0.05***
Inte2	0.07***	0.09***			0.04***	0.03***			0.08***	0.09***			0.04***	0.02***		
Dogvi	0..04***	0.06***	0.04***	0.06***	0.009***		0.009**		0.059***	0.065***	0.05***	0.06***	0.01***		0.009***	
Dgove	0.01*	0.02**	0.01	0.02**	0.006**		0.005**		0.013	0.021**	0.01	0.02**	0.005**		0.005**	
Vol	-2.55		-2.6		1.19***	1.23***	1.17***	1.21***	-3.45*		-3.52*		1.13***	1.40***	1.12***	1.39***
Er3i	-0.08***		-0.08***		-0.00	-0.01	-0.00	-0.01								
Er3e	-0.012		-0.01		0.00	-0.00	0.00	-0.00								
Fixi									-0.05***		-0.05***		0.01	0.02	0.013	0.02
Fixe									-0.07***		-0.07***		-0.03	-0.01	-0.02	-0.01
Floati									-0.07***		-0.08***		-0.00	0.03	-0.00	0.03*
Floate									-0.010		-0.011		-0.01	-0.01	-0.01	-0.01
R2	0.0823	0.0509	0.0841	0.0523	0.0634	0.0547	0.0573	0.0494	0.0789	0.0509	0.0586	0.0523	0.0649	0.0396	0.0586	0.0387
N	1189	1189	1189	1189	1567	1567	1567	1567	1189	1189	1567	1189	1567	1731	1567	1731
F	14.84	17.82	15.20	18.33	13.96	17.95	12.53	16.10	10.61	17.82	9.61	18.33	10.73	9.64	9.61	9.41

Inte (inte2) = (squared) bilateral trade divided by importer's and exporter's gdp product, in logarithm

4.3 Synthèse

Monetary and fiscal policy affect the degree of commercial integration by increasing the correlation of cycles through a number of "demand" channels. In turn, increased correlation leads to a higher degree of bilateral trade integration by relaxing the current account constraint. This increased integration will then lead to greater or lesser correlation of business cycles, depending on the contentious effect of integration on specialisation. If integration does not promote specialisation, b2 is positive and the net effect of integration (b2 versus bk, k varying from 3 to 8, see equations 4 and 4bis) must be positive[32]. As far as the integration process of CEECs is based on an increasing part of intra-branch trade, and that b2, the within estimator, is positive, it follows that the net effect is positive. In other words, if the probability of asymmetric shocks decreases due to intra-branch trade intensity, it is straightforward to think that the temptation to resort to fiscal or monetary policy to relax the external constraint will be lessened.

Even if residual asymmetric shocks remained, they could well be handled within the fiscal policy framework. The Baltic States, which adopted currency boards very early and thus gave up independent monetary policy, showed that they were able to manage their business cycles through fiscal policy only. Kutan, Ali M. and Pautola-Mol, Niina (2001) show that the deficit grows during recessions and drops in downwards phases of the cycle, without exceeding the limit imposed by the Stability Pact. One can justifiably think that other CEECs, further advanced in their reforms, structurally closer to the EU, and whose intra-branch trade represents, as shown on table 7, a larger share of total trade[33], should not be in a position worse than that of the Baltic States, if they adopted the euro.

They should actually be better, because the euro is much more than a fixed exchange rate regime, in which economic policy is reduced to its fiscal dimension. The euro is also a single market, that is a unified market, in which the difficulties of financing the current balance, often due to market imperfections, are reduced, and in which the market of titles is also unified, thus allowing member countries to diversify the risk that asymmetric national shocks impose on the domestic economy.

[32] But even if b2 is negative, the question of determining what channel dominates remains open. The paper by Flandreau and Maurel [2001] shows that within the austro-hungarian monetary union, trade was specialised (the authors find a negative b2), but that fiscal policy coordination and financial integration compensated the negative effect of specialisation on cycle correlation.

[33] The share of intra-branch trade between the Czech Republic and the EU is twice as large as Estonia's.

Conclusion

Rose's finding [2000] that membership into the EMU produces a very large effect in terms of trade creation is questioned by focusing on the EU enlargement towards CEECs. While the last decade has been characterised by a dramatic increase in East-West trade flows, we observe an extremely wide range of exchange rate regimes, from currency boards to pure floats. Estimating a gravity equation similar to that of Rose we find that fixing the currency would not increase trade. Trade creation from EMU would derive only partially from the reduction in transaction costs, measured through bilateral exchange rate volatility, but not only, in as much as both float and fix exchange rate regimes are associated with higher trade. Following Flandreau and Maurel [2001], the gravity equation is augmented by adding the correlation of business cycles, which measures the impact of the external constraint on trade. If business cycles are correlated, there is no limit to trade expansion. But if economic activity goes in a direction opposite to that of the main trade partners, then the current account imbalance might exert a depressive effect on trade flows. Our results support the view that external constraints matter, and that the process of trade integration within monetary union is accompanied by monetary and fiscal co-ordination.

East-West trade has been characterised by an increase in the share of intra-industry trade. Fidrmuc and Franz [2000] argue that this pattern has favoured the symmetry of business cycles, and decreased the cost which would imply pegging the currencies to the Euro. Our results support that view. Positive within-estimators of the correlation between business cycles and trade integration suggest that countries trade commodities produced in the same sectors (intra-industry trade) and that any increase in trade imply a higher degree of economic co-variation. Symmetry is further enhanced by co-ordination of fiscal policy, manipulation of exchange rate volatility and changes in exchange rate regimes. Moving towards more floating currencies is a tool for addressing the negative impact that an asymmetric shock might have on the process of trade integration; under a fixed exchange rate, synchronising governments spending provides with an alternative way of smoothening business cycles.

Assuming that the share of intra-industry trade will continue to increase over time, and that it will reduce the need for monetary and fiscal policies adjustments, our conclusion is that the cost of pegging the currencies is decreasing over time. Before joining the EU and eventually

the EMU, counter-cyclical exchange rate and fiscal policies relax the external constraint and dampen the effect residual asymmetry might have on trade integration. Under the framework of ERM2 and EMU the room for manipulating exchange rate volatility will be narrowed. Countries will be left with the sole option of fiscal policy and variation of government spending (which is shown to influence the degree of symmetry of business cycles, hence to favour the process of trade integration), although limited by the Stability Pact. Therefore, the higher the degree of trade integration reached at the date of EU entry, the lower the cost of EU membership for candidate countries.

To the extent that the choice of a particular exchange rate regime contributes to foster trade integration, any exchange rate is feasible and desirable. But the poor ability of emerging countries to engage in successful counter-cyclical policies leads to conclude that one should not overemphasise the latter argument. Instead, EU and EMU membership is sought because it provides candidate countries with a deep monetary integration and facilitates a much higher degree of formal and informal insurance channels than such countries may otherwise be able to attain[34].

[34] Even if East West trade were specialised, membership in the EMU would not necessarily be costly. The Austro-Hungarian precedent in Flandreau and Maurel [201] shows that the degree of financial integration reached between countries tied up by a tacit pact of stability and fiscal discipline was large enough to compensate for the loss of separate monetary and fiscal policies.

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Table 1: exchange regimes in the CEEC over the decade

Country	Period	Exchange Rate Regime	Currency Basket / Target Currency	Band
Albania		Independent float	DM-ised in practice	
Bosnia-Herzegovina	20/06/97 - 31/12/98	Currency Board	DM	0%
	01/01/99 - ?	Currency Board	Euro	
Bulgaria	02/91 - 31/06/97	Managed Float		
	01/07/97 - 31/12/98	Currency Board	DM	0%
	01/01/99 - ?	Currency Board	Euro	0%
Croatia		Managed Float	DM target band de facto	
Czech Republic	12/90 - 27/05/97	Peg	DM(65%), USD(35%)	7.5%
	27/05/97 - ?	Managed Float		
Estonia	06/92 - 31/12/98	Currency Board	DM	3%
	31/12/98 – 01/01/99	Currency Board	Euro	
Hungary	03/95 - 31/12/98	Crawling Peg	DM(70%), USD(30%)	2.25%
	01/01/99 - ?	Crawling Peg	Euro(70%), USD(30%)	2.25%
Latvia	02/94 - now	Peg	SDR	
Lithuania	10/92 - 03/94	Independent Float		
	04/94 - ?	Currency Board	USD	0 %
FYR Macedonia		Managed Float	DM target band	
Poland	16/05/95 – 01/01/99	Crawling Peg	USD(45%), DM(35%) BP (10%), FF (5%), SWF (5%)	7%
	01/01/99 - ?	Crawling Peg	Euro(55%), USD(45%)	7%
Romania		Independent Float		
Slovak Republic	July 1995- 31/12/98	Fixed Peg	DM (60%), USD(40%)	7%
	01/01/99 - ?	Independent Float		
Slovenia		Managed Float	DM shadow + real exchange rate rule	
FR Yugoslavia		Fixed Peg	DM	

Sources : Koen Shoors (2001)

Table 2: Exchange rates

CEECs' official exchange rates per DM											
	Averages 90	91	92	93	94	95	96	97	98	99	00
Bulgaria	0,00	0,01	0,01	0,02	0,03	0,05	0,12	0,97	1,00	1,00	1,00
Czech Rep.	na	na	na	17,63	17,74	18,52	18,04	18,28	18,35	18,83	18,18
Hungary	39,12	45,03	50,58	55,61	64,80	87,70	101,44	107,72	121,84	129,18	132,92
Poland	0,59	0,64	0,87	1,10	1,40	1,69	1,79	1,89	1,98	2,16	2,05
Romania	13,88	46,03	197,20	459,71	1020	1419	2050	4134	5044	8352	10226
Slovakia	na	na	na	18,61	19,75	20,73	20,37	19,39	20,02	22,53	21,85
Slovenia	na	na	na	68,49	79,38	82,70	89,96	92,09	94,41	99,01	104,89
Estonia	na	na	na	8,00	8,01	8,00	8,00	8,01	8,00	8,00	7,99
Latvia	na	na	0,47	0,41	0,34	0,37	0,37	0,34	0,34	0,32	0,29
Lithuania	na	na	1,14	2,63	2,45	2,79	2,66	2,31	2,27	2,18	1,88

Source: IMF International Financial Statistics, March 2001

Table 2: Exchange rates (continued)

CEEC's official exchange rates per USD											
	Averages										
	90	91	92	93	94	95	96	97	98	99	00
Bulgaria	0,00	0,02	0,02	0,03	0,05	0,07	0,18	1,68	1,76	1,84	2,12
Czech Rep.	na	na	na	29,15	28,79	26,54	27,14	31,70	32,28	34,57	38,60
Hungary	63,21	74,74	78,99	91,93	105,16	125,68	152,65	186,79	214,40	237,15	282,18
Poland	0,95	1,06	1,36	1,81	2,27	2,42	2,70	3,28	3,48	3,97	4,35
Romania	22,43	76,39	307,95	760,05	1655	2033	3084	7168	8876	15333	21709
Slovakia	na	na	na	30,77	32,04	29,71	30,65	33,62	35,23	41,36	46,40
Slovenia	na	55,56	81,29	113,24	128,81	118,52	135,36	159,69	166,13	181,77	222,66
Estonia	na	na	12,11	13,22	12,99	11,46	12,03	13,88	14,07	14,68	16,97
Latvia	na	na	0,69	0,68	0,56	0,53	0,55	0,58	0,59	0,59	0,61
Lithuania	na	na	3,22	4,34	3,98	4,00	4,00	4,00	4,00	4,00	4,00
	Standard deviations										
Bulgaria	na	0,01	0,00	0,00	0,01	0,00	0,07	0,40	0,06	0,06	0,12
Czech Rep.	na	na	na	0,43	0,94	0,60	0,42	2,39	1,96	1,43	1,92
Hungary	1,68	3,01	1,70	5,25	2,92	8,71	5,80	10,82	5,08	9,02	18,93
Poland	0,00	0,09	0,11	0,17	0,06	0,04	0,11	0,20	0,10	0,18	0,19
Romania	4,92	46,41	101,10	192,85	112,68	184,53	246,35	761,86	533,32	1871	2342
Slovakia	na	na	na	1,83	0,92	0,60	0,44	0,74	0,52	2,12	3,15
Slovenia	na	na	8,78	8,82	4,60	4,30	2,85	7,21	5,59	8,90	16,64
Estonia	na	na	0,45	0,31	0,65	0,39	0,19	0,48	0,51	0,51	0,96
Latvia	na	na	0,11	0,08	0,02	0,01	0,00	0,01	0,01	0,01	0,01
Lithuania	na	na	na	0,45	0,04	0,00	0,00	0,00	0,00	0,00	0,00

Source: IMF International Financial Statistics, March 2001, Monthly average

Table 3: Inflation rates

	(% change, annual averages)										
	90	91	92	93	94	95	96	97	98	99*	00**
Bulgaria	26,3	334	82,0	73,0	96,3	62,0	123	1 082	22,2	0,7	7,0
Czech Rep.	9,7	52,0	11,1	20,8	10,0	9,1	8,8	8,5	10,7	2,1	3,9
Hungary	28,9	35,0	23,0	22,5	18,8	28,2	23,6	18,3	14,3	10,1	9,5
Poland	586	70,3	43,0	35,3	32,2	27,8	19,9	14,9	11,8	7,3	9,9
Romania	5,1	170,0	210,0	256	137	32,3	38,8	154	59,1	45,8	45,0
Slovakia	10,8	61,2	10,0	23,2	13,4	9,9	5,8	6,1	6,7	10,6	11,9
Slovenia	550	118	207	32,9	21,0	13,5	9,9	8,4	8,0	6,1	8,6
Estonia	23,1	211,0	1 076	89,8	47,7	29,0	23,1	11,2	8,2	3,3	3,8
Latvia	10,5	172	951	109	35,9	25,0	17,6	8,4	4,7	2,4	2,9
Lithuania	8,4	225	1 021	410	72,1	39,6	24,6	8,9	5,1	0,8	1,0
CEECs average excl. Romania and Bulgaria	153,4	118,1	417,8	92,9	31,4	22,8	16,7	10,6	8,7	5,3	6,4
Euro area average	4,5	4,7	4,6	4,2	3,4	3,0	2,5	2,0	1,4	1,2	2,2
EU average	5,2	5,6	4,5	4,1	3,3	3,1	2,7	2,1	1,6	1,4	2,1
"3 best EU" av. ****	3,1	3,4	3,6	3,2	2,7	1,8	2,0	1,7	0,8	0,6	1,7
Bulgaria, indices	2,2	9,5	18,2	31,5	61,7	100,0	221,6	2 567	3 046	3 125	3 449
IMF: Index numbers, 1995=100, period averages											

Notes:*) Estimates
**) Projections
***) CEECs: retail/consumer price level
Euro area and EU: private consumption deflator
****) Three "best performing EU countries" with lowest inflation in 1998 and 1999 are Austria, Germany and France

Source: CEECs: EBRD Transition Reports, 2000
EU average: OECD Economic Outlook, December 2000