EMU Enlargement and Central Bank Independence: Which Concept of Convergence to Apply?*

Rozszerzenie Unii Gospodarczej i Walutowej i niezależność banku centralnego. Jaką zastosować koncepcję konwergencji?

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Abstract

EMU enlargement not only depends on the individual state of convergence of the accession candidates, but also on their political situation. Therefore, we argue that institutional convergence, in particular monetary policy binding, is equally – if not more – important for successful monetary policy in Euroland than nominal and real convergence. Based on a constitutional political economy framework, we assess the degree of central bank independence (CBI) in CEE using different measures. It can be shown that the degree of central bank independence in CEE countries is considerably high; however, there is a (decreasing) gap to the ECB's independence with respect to external aspects of CBI.

Keywords: convergence, central bank independence, EMU enlargement

JEL: D70, E42

Streszczenie

Rozszerzenie Unii Gospodarczej i Walutowej nie zależy jedynie od indywidualnego zaawansowania procesu konwergencji kandydatów przystępujących do UGW, ale także od ich sytuacji politycznej. Twierdzimy zatem, że konwergencja instytucjonalna, w szczególności wiążąca politykę pieniężną, jest równie (jeśli nie bardziej) istotna dla prowadzenia pomyślnej polityki monetarnej w eurolandzie niż konwergencja nominalna i realna. Zgodnie z konstytucyjnymi ramami ekonomii politycznej oceniamy za pomocą różnych miar stopień niezależności banku centralnego (CBI) w krajach Środkowej i Wschodniej Europy. Można wykazać, że stopień niezależności banku centralnego w tych krajach jest znaczny. Istnieje jednak (zmniejszająca się) różnica w stosunku do niezależności EBC w zakresie zewnętrznych aspektów niezależności.

Słowa kluczowe: konwergencja, niezależność banku centralnego, rozszerzenie UGW

1. Introduction

The EU-enlargement in January 2007 is an official marking of the end of the transition period to a market economy for another two countries in Central and Eastern Europe (CEE), namely Bulgaria and Romania. Of all new EU member states however, Slovenia is the only one to join the European Monetary and Economic Union (EMU). Others are still to follow. Indeed almost all CEE countries are preparing themselves to finally become a member of EMU. Despite these efforts, there are still significant differences with respect to convergence towards the EU average.

Convergence can be defined in different ways. The Maastricht criteria demand nominal convergence of public debt, public deficit, inflation, interest rates and a fixed and stable exchange rate between the accession candidate's currency and the euro. In contrast to this requirement, many observers claim that real convergence, e.g. the development of productivity, is the issue that truly matters. This issue has gained relevance throughout the last ten years as politicians in both current member countries and accession countries have explicitly expressed and realised their desire for more flexible arrangements, an example being the reform of the Stability and Growth Pact in 2003.

This reform has probably had a negative effect on fiscal discipline in Euroland and candidates for membership. Hungary for instance has increased the annual public budget deficit once again up to 10.1 per cent of GDP. In this paper, we argue that this evidence makes institutional convergence equally – if not more – important as other forms of convergence for a successful common monetary policy in Euroland. Institutional convergence can be defined as the adjustment of policy rules in the new member countries from CEE towards standards in the core Euroland members, in our context mainly with respect to monetary policy. First, it is likely that accession of new members to EMU finally becomes a political rather than an economic issue – regardless of the state of nominal convergence. The institutional arrangement then provides a "line of defence". The stronger monetary policy rules restrict politicians, the less severe *ceteris paribus* is a deviation of new EMU members from the Maastricht criteria with respect to future inflation. Second, a proper institutional arrangement is a precondition for stability and growth, i.e. nominal and real convergence. The state of institutional convergence reveals the individual accession country's attitude towards commitment and the appropriate policy assignment. Institutional convergence in this context implies the adoption of the EU's formal (and informal) rules including the *acquis communautaire* by the accession countries, in particular central bank independence (CBI). The Treaty of Maastricht requires the introduction of CBI for potential EMU members.

Nevertheless, differences in detail between countries, which may lead to potential and significant conflicts in the future, are likely. These differences can be overlooked, if the definition and measure of CBI applied neglects some aspects of monetary commitment.

The paper starts with an assessment of the state of convergence of CEE countries in nominal and real terms (section II). In the third section, we set the theoretical framework for the introduction of CBI and introduce some measures of CBI. We then assess the degree of central bank independence in CEE by referring to the literature and to own calculations. We apply a measure of monetary commitment, which includes both internal and external criteria such as convertibility and exchange rate regimes. It turns out that the degree of central bank independence in CEE countries is considerably high; however, there is still a gap to the ECB's independence with respect to external aspects of CBI in some countries and concerning the strictness of limitations to government borrowing from the central bank in others. This gap will be analysed against the background of the theoretical framework. The paper ends with policy conclusions for a future enlarged EMU.

2. Nominal and real convergence of CEECs

The debate on convergence of the CEE countries to the EMU member countries has become quiet after it shifted from nominal convergence to real convergence and the potential policy dilemma when striving for both (e.g. Padoa-Schioppa 2003). As for nominal convergence, for entrants to the EMU the Maastricht Treaty requires to stay below exactly defined thresholds for public debt, annual public budget deficits, interest rates and inflation as well as the stability of the nominal exchange rate for a minimum of two years prior to EMU accession.[1] On the basis of these criteria the European Council decides whether or not a country is mature enough to join EMU. In addition, the Stability and Growth Pact (SGP) requires the member countries to meet the fiscal criteria also during membership.[2] Currently, of the transition countries in CEE only Hungary struggles with the fiscal criterion on debt, some others have difficulties to meet the budget criterion (Table 1). Consequently, in the literature about enlargement, the SGP currently does

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[1] The exact thresholds are: stock of public debt no bigger than 60 per cent of GDP, annual public deficit no bigger than 3 per cent of GDP, inflation rate not higher than 1.5 per cent above the average of the best three performing countries, interest rates not higher than 2 per cent above the average of the best three performing countries and no exchange rate realignment within the last two years before accession to EMU.

[2] In case of an excessive deficit, the European Commission is enabled to demand appropriate steps to reduce this deficit. If these steps are not taken, a deposit of 0.2–0.5 per cent of GDP may be charged, which can be converted into a fine (EEAG 2003, p. 53f). However, the amendments made after 23 November, 2003, make it more difficult to identify an excessive budget deficit. For critique at the SGP and reform proposals see e.g. Eichengreen (2003) and Eijffinger (2003).

Table 1. *Nominal and real convergence in accession countries in 2006*

	HICP, annual change in %	Annual public budget balance in % of GDP	Stock of public debt in % of GDP	GDP per capita (EU-25 = 100) in 2005	Unemployment	Current account deficit in % of GDP
Bulgaria	7.3	2.3	31.9*	33	10.1*	12.4
Czech Republic	2.1	-3.5	30.9	74	7.3	1.9
Estonia	4.4	2.5	4.0	60	5.2	12.0
Hungary	4.0	-10.1	67.6	63	7.4	9.1
Latvia	6.6	-1.0	11.1	48	7.3	14.0
Lithuania	3.8	-1.3*	48.9*	52	5.7	7.5
Poland	1.3	-2.2	42.4	50	14.9	1.7
Romania	6.6	-1.0**	22.4**	34	7.7*	10.9
Slovakia	4.3	-3.4	33.0	57	13.7	7.7
Slovenia	2.5	-0.1**	29.5**	82	6.3	2.0

*:2005; ** 2004

Sources: IMF (2006a; 2006b; 2006c; 2007a; 2007b); ECB (2006); Eurostat.

not play a significant role, in particular not after the amendment.

Rather, the likely effects of fast real convergence on the real exchange rate and consequently on the inflation rates have been discussed widely. Szapáry (2000) was the first to argue that countries may feel tempted to repress economic growth for one year or even longer prior to accession in order to meet the inflation criterion (*weighing-in syndrome*). After the very country has become a member, inflation will be spurred via extensive productivity growth beyond the established member countries. Szapáry – and others[3] – therefore suggests skipping that criterion. Empirical evidence of this effect, the so-called Balassa-Samuelson effect, is somewhat mixed. Only about 0 to 2 percentage points of the average inflation differential between accession candidates and the established EMU members can be explained by the effect (Mihaljek 2003).[4] Other explanations for the high inflation differential include changes of administrative prices (MacDonald, Wojcik 2002) as well as (foreign) investment demand (Fischer 2002; EEAG 2004, p. 133f), not to mention different monetary policy. The latter has been a decreasing problem for transition economies in the second half of the 1990s.

However, this mixed evidence does not imply that future problems with the inflation criterion are not to be expected. Besides the causes mentioned above, there are also other potential causes for higher inflation in accession countries than in established member countries, particularly after EU accession. One cause can be the high inflow of structural funds into the new member countries from 2004 on. These can add purchasing power in the country of up to an official threshold of 4 per cent of GDP, potentially leading to an increase in the prices for non-tradables. Similarly, a potential increase in capital inflows after EU accession

due to improved investment opportunity will also cause purchasing power in the very country to rise. Spain has made this experience in the late 1980s after the southern enlargement. A surge in capital inflows increased the inflation rate in the European Monetary System (EMS) (Dluhosch et al. 1996, p. 199–204; EEAG 2004, p. 133f). In both cases, the responsibility for the real appreciation (via the price increase of non-tradables) and the subsequent increase in inflation is not with the accession countries. It is not necessary that macroeconomic policy is unsound to produce these results. Consequently, inflation might not be the most adequate criterion to measure the readiness of new member states to join the EMU.

Table 1 gives evidence about the state of nominal (columns 1 through 3) and real (columns 4 through 6) convergence of CEE accession candidates. It reveals that some countries still have a substantially higher inflation rate (HICP) than Euroland (2.7 per cent on average in 2006). On the other hand, the Czech Republic, Lithuania and Poland (plus Slovenia) would pass this criterion. In contrast, fiscal policy can be regarded as having been considerably solid for many years in most countries, except for the four bigger ones, where the annual deficit has remained substantially high since 2003. Finally, the debt stock is not a problem so far for any of the CEE countries under scrutiny, except for Hungary. To the contrary, some countries, in particular Estonia and its Baltic neighbours, show a remarkable fiscal discipline.[5] It is fair to say that the accession candidates have made good progress with respect to inflation and fiscal policy. Their fiscal position seems to be even better than the position of the EMU-12 countries in 1997 when the decision about the EMU's founding members were taken.

Whereas policymakers in the European Union leave no doubt that the Maastricht criteria are exclusively

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[3] E.g. Buiter and Grafe (2002, p. 23) argue that "To make inflation a convergence criterion for monetary union is putting the cart in front of the horse".

[4] See Égert (2002) for a differentiated analysis of major accession countries.

[5] In Estonia, the government is by law prohibited to run a permanent public deficit (Ennuste 2001, p. 352).

relevant for the assessment of CEE countries' maturity and ability to join the EMU,[6] policymakers in the accession countries and economists started to discuss the issue and to refer to real convergence. Columns 4 through 6 in Table 1 show the degree of real convergence. The real GDP per capita varies from about 33 per cent of EMU average in Bulgaria to 82 per cent in Slovenia. It is noticeable that the bigger transition countries, which were catching up faster in the past, have had more difficulties to close the gap since 2002. The catching up process gained speed in comparison with the late 1990s. The same holds for the decreasing rate of unemployment.

At the same time, there is obviously much potential for future productivity gains plus real appreciation. This can also be seen when analysing the current account balances in the accession countries. The current account deficits imply a considerable capital inflow in 2006, which has been considerably high since 2002. If these capital flows will continue in 2007, and 2008 and the years to follow, there will also be an upward pressure on the real exchange rate. If the EU enlargement results in the expected positive consequences for the new members (see above), this scenario will be highly likely. The data support the theoretical considerations about the probability that accession candidates miss the nominal convergence criteria.

However, it cannot be desirable to repress economic activity and to accept a recession for a year or more in order to meet the criteria, as feared by Szapáry (2000). So there obviously is a trade-off between the objective to accelerate growth and the objective to meet the Maastricht criteria, in particular the inflation criterion. As this discrepancy seems so clear, one cannot be sure that the European Council will not take it into account when deciding about the enlargement in 2007 or later. The acknowledgement of this trade-off and the accession countries' efforts to foster both real and nominal convergence may well lead to the decision that countries join the monetary union regardless of the missed inflation criterion.[7] This political rather than economic decision making process could be observed in 1998 when 11 countries joined the European Union, although formally only three (Finland, France and Luxembourg) met all criteria. As the evidence also shows, the fact that the majority did not meet the criteria completely does not inevitably imply unsound monetary policy for the future. In addition, it is fair to assume that in a situation as described the well-known argument will be employed that the criteria are not justified economically but rather arbitrarily chosen.

Therefore, another safeguard mechanism is necessary to protect the EMU from countries with sustained unsound macroeconomic policy joining the monetary union, namely institutional convergence. The literature on rules vs. discretion has made a case for a strong monetary commitment to avoid surprise inflation. Indeed, it seems to be more important to create an institutional setting, which prevents an inflationary bias and sets the highest possible standards in monetary policy than to at any rate avoid an increase in inflation due to the Balassa-Samuelson effect.

Institutional convergence has several dimensions, parts of which are of fiscal nature. Here, nominal and institutional convergence coincide, if fiscal rules exist, which is the case in some EMU member countries and is not in others. The criteria expressed in the Maastricht Treaty reflect current behaviour. However, the core of the argument presented here is not about results, but about rules. Rules are introduced to restrict public and private actors. In the context of the European Monetary Union, monetary rules are decisive. A high degree of monetary commitment is first and foremost a signal that accession countries are willing and able to meet the high standards of the EMU and to actively participate in EMU's stability oriented policy. This is particularly important as the planned voting rules for an enlarged EMU give representatives from smaller countries more weight than hitherto. In addition, it becomes increasingly necessary, if fiscal rules are too weak or non-existing. A good example illustrating the necessity to restrict politicians' influence on central banks is the latest attempts of the French President Nicolas Sarkozy to force the ECB into a depreciation of the Euro and to neglect the Stability and Growth Pact in June 2007. They make clear why rule bound monetary policy is so important. If the ECB had positively responded, the inflationary potential would have been increased.

Thus, appropriate institutions that reduce discretionary leeways for short-term oriented politicians are a precondition for a positive economic development. In other words, they can help with both price stability and economic growth; put yet differently: nominal and real convergence in Central and Eastern Europe positively depend on institutional convergence.

3. CBI as constitutional rule: Theoretical considerations

Monetary policy in Euroland is rule bound. The European Central Bank (ECB) has to follow a clearly defined policy objective, namely price stability. It also is required to follow other objectives, if this does not endanger price stability. However, the Bank interprets this according to a neo-classical economic policy assignment: the best way to meet economic policy objectives is to provide stable

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[6] Maier and Hendrikx (2003) argue in addition that social convergence is important to avoid future conflicts about appropriate monetary policy in an enlarged EMU.

[7] This seems to be particularly probable, if small countries such as e.g. the Baltic countries meet all criteria and bigger ones such as Hungary or Poland do not.

money (De Grauwe 2002, p. 694).[8] The European Central Bank is according to its statute legally very independent from day-to-day politics and has proven its ability to resist pressures from politics very well. In particular, the opportunities of national governments to exert pressure on the ECB are rather low. In order to qualify for EMU membership, the CEE accession countries also have had to introduce CBI as part of the "acquis communautaire". This requirement is theoretically justified by the political nature of inflation processes. There is a theoretical case and solid empirical evidence that inflation, in particular high and hyperinflation is caused by the inability (or unwillingness) of governments to meet other policy objectives such as employment or fiscal needs with other means than the money press.[9] There is also evidence that inflation occurs mainly in the absence of adequate monetary policy rules, in other words monetary commitment is negatively correlated with inflation (Berger et al. 2001; Freytag 2002b; Freytag, Schneider 2007).

The economic reason for a strict legal monetary commitment is that ex-ante the citizens prefer price stability over inflation; they know that the distributional effects of inflation are very uncertain and arbitrary. In general, the government is willing to follow this objective as well. However, under certain circumstances, such as a recession with increasing unemployment, the government's preferences switch, and it would like to deviate from the objective of price stability in order to meet other policy objectives with the help of monetary policy. In such a situation, a majority even might be in favour of a lax monetary policy, deviating from the objective of price stability although there can be no serious doubt that neither price stability nor the other goal is sustainably met with this deviation. Thus, it makes sense for the society to protect itself from the government's discretion and from own insecurities. This is done in a "constitutional decision".[10] The society opts for a rule based monetary policy, aiming at price stability as the only or primary goal (see discussion above). To raise the political costs of discretionary policy, commitment has to be strong. Monetary commitment is commitment of governments (Brennan, Buchanan 1981). It is the government that promises to stick to a stability oriented monetary regime.[11] The regime defines rules and responsibilities with a focus on price

stability. There are several ways to define the regime, of which we discuss contracts for central bankers and central bank independence.

To begin with, a government can conclude a contract with the members of the central bank's board, which foresees a punishment once a certain inflation rate is missed (Walsh 1995). However, it has to be noted that the underlying principal-agent-problem is not described appropriately by this setting, as it assumes that the government is the principal and the central bankers are agents. Surely, this problem exists. Nevertheless, this model does not consider the governmental self-interest appropriately by assuming that the government is only representing the citizens. It seems more adequate to assume the public being the principal and the government being the agent, trying to benefit from hidden information.[12] Contracts for central bankers do not solve this principal-agent-problem (McCallum 1997; Wood 1997). Government and central bankers might be prone to renege commonly. This problem of contracts becomes even more difficult to tackle in a monetary union such as EMU. The principal-agent-relation is not easy to sort out, the information being distributed even more asymmetrically between government and common central bank on the one hand and the European public on the other. Therefore, it cannot be excluded that the EMU member governments agree on a cartel-like behaviour opposing the general preference for low inflation. If the ECB had a contract with the European Council instead of granted independence, in domestic discussions each government would be able to use the argument that it was forced to less stability by a majority of members.[13] The political costs of inflation would be low with a contract between the European Council and the ECB's board of governors.

Therefore, it is necessary to find an arrangement of strong monetary policy rules that avoids governmental arbitrariness in monetary policy. Central bank independence with a clearly defined policy objective, namely price stability, with clear rules about the board members and prohibition of central bank lending to the government, as laid down in the Maastricht Treaty, seems to be the adequate answer to the principal-agent-problem. This problem is best solved by granting instrument independence, but not goal independence to the central bank (Debelle, Fischer 1995). This implies that the central bank is granted the independence from daily politics with respect to the instrument it uses to meet a politically given policy objective. In such a setting, the independent central bankers cannot impose their preferences on society if they stick to price stability in a recession and reject demands for additional money

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[8] De Grauwe (2002, p. 694-702) criticises the ECB for this interpretation. Thereby, he implicitly assumes that economic policy is pursued by benevolent policymakers. This view does not stand a political economy perspective.

[9] See e.g. Cukierman (1992, chapters 3 through 5), Fischer et al. (2002) and Freytag (2002a).

[10] A "constitutional decision" is not restricted to the country's constitution; it rather reflects the idea that it is a decision about the rules of the game. These can be laid down in a law, a statute or (as in the case of EMU) in an international treaty. Following Hetzel (1997, p. 50f), the monetary rule should have constitutional quality, albeit spelled with a small 'c' rather than a capital 'C'.

[11] For methodical reasons, we analyse de jure commitment. De facto commitment is difficult to separate from credibility as it includes all attempts to cheat the public. Indeed, it seems even misspelled to name it commitment.

[12] At least this is a relevant principal-agent problem, as both problems exist paralelly.

[13] This is a 'perverse' application of the dirty work hypothesis, put forward by Vaubel (1991).

supply to stimulate the economy, as it is sometimes argued (e.g. Fischer 1995, p. 202). This argument is indeed misleading as the "constitutional decision" can only be reversed by another one. In particular, it is not the task of the central bankers to reinterpret their policy objective upon political demand. Independent central bankers only impose society's preferences on society.[14]

There is, however, one shortcoming in the usual interpretation of CBI. Central bank independence as interpreted in politics and defined in the literature[15] is restricted to domestic monetary policy issues such as lending restrictions, policy formulation and relations between government and central bank. The relatively low correlation of de jure CBI and inflation (Berger et al. 2001, see also below) has led to an increasing critical attitude towards the benefits of CBI. Hayo and Hefeker (2002) claim that CBI is neither a necessary nor a sufficient condition for price stability. They argue that there are alternatives to CBI, e.g. the already discussed contracts or exchange rate based stabilisation. The latter arrangement is also a monetary commitment, directed at external aspects and neglecting internal components of the regime. A foreign currency is used as a nominal anchor to achieve price stability. However, the criticism of low correlation between commitment and inflation also holds for exchange rate policy; it is even more difficult to identify a significant correlation between price stability and exchange rate fixing as an alternative to CBI (Kuttner, Posen 2001; Freytag 2002b).

We, therefore, argue that monetary commitment is not restricted to either internal or external aspects of monetary policy. It is a rather comprehensive concept consisting of internal and external components, which both are important for monetary stability. This can be easily seen with respect to the exchange rate regime, which affects price stability to a great deal. Interpreting external elements of the monetary regime – such as the responsibility for the exchange rate regime, convertibility, the opportunity to conduct business in forex etc. – as constitutive part of the monetary regime, is sensible as it reflects the government's determination to pursue their monetary (and other macroeconomic) policy in a competitive international environment. This requirement seems to be particularly important in a dynamic setting: only a comprehensive and consistent policy assignment will allow a newly installed independent central bank in transition countries to become credible (Wagner 1998). Summarising, only a comprehensive view on monetary commitment allows identifying the government's sincerity to guarantee stability of the currency (Freytag

2001). With a view on an enlarged EMU, this sincerity is truly important.

To be sure that all EMU members use the same institutional setting, the Maastricht Treaty prescribes a high degree of CBI for the national central banks of all member countries. In the meantime, CBI has been granted to almost all accession candidates from CEE. Nevertheless, granting legal independence and introducing the correct incentives for governments and central banks takes time. Therefore, one cannot expect that monetary commitment in transition will be fixed once and never changed. Indeed, a number of countries have completely reshaped their central bank legislation at least twice after 1989, e.g. Poland, Bulgaria, Lithuania, Hungary and Slovenia, not to mention numerous amendments in almost all countries. If one adds exchange rate policy to this picture, institutional changes took place even more frequently. So there seems to be a convergence process with respect to the monetary regime in CEE, the result of which can be seen in Table 3. In the remainder of this section we introduce different measures of CBI and monetary commitment, which have been used to assess the degree of CBI in the CEE countries (see section IV).

Legal CBI is generally measured by assessing the central bank law with respect to the ability of the central bankers to pursue a stability oriented monetary policy free of political influence. Thus certain criteria are introduced and given numerical values, which will be either added up (GMT-method) or averaged weighted or unweighted (Cukierman-method). The measures of CBI in general have similar components, which can be distinguished into five groups. Not all measures consider all aspects mentioned in the following. In Table 2, some of the indicators, namely those recently used to calculate CBI in CEE countries, are presented and compared with respect to these five groups.

First, independence of central banks is related to their CEOs, in particular their expertise, appointment and dismissal rules as well as number and length of terms. It is also of interest who appoints the CEO and board members and whether or not board members are allowed to hold other offices. Finally, one criterion is whether or not government members are on the board. A second group is related to policy formulation. In particular the question of whether or not the government is permitted to exert influence on monetary policy is of importance. It is analysed who sets discount rates, who sets the budget etc. Another element in this category is financial supervision, i.e. the question of whether it takes place at all and the question of who is responsible for banking regulation and supervision.[16] Finally, it has to be analysed how the central bank is accountable (de Haan et al. 1998;

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[14] This would be different, if only the preferences of potential central bankers were considered in the appointment process, e.g. if conservative or dry central bankers were appointed (Rogoff 1985, Vickers 1986). It may make sense to appoint conservative central bankers as a complement to monetary commitment, but not as alternative. Therefore, this option is not discussed in this section.

[15] See e.g. Arnone et al. (2006a; 2006b), Cukierman (1992), Eijffinger, de Haan (1996), Wagner (1998), Berger et al. (2001) for an introduction and overview.

[16] There is a growing interest in financial supervision. See e.g. Eijffinger, de Haan (1996) and Masciandaro (2004), who discusses the question of why governments decide to choose a certain regulatory regime for financial markets. See also Freytag, Masciandaro (2007) for a discussion of the relation between CBI and financial supervision.

Table 2. *Measures of monetary commitment: methods and components*

	GMT (Maliszewski 2000) (CBI)	Cukierman et al. (2002) (CBI)	Freytag (2001) (monetary commitment)
Method	**adding up (0–16)**	**average (0–1)**	**average (0–1)**
Groups			
CEO	– term length – who appoints CEO? – dismissal – who appoints board members? – governmental board member? *31.25 per cent*	– term lengths – who appoints? – dismissal – other offices *20 per cent*	– expertise – dismissal *10 per cent*
Policy formulation	– governmental approval – responsibility for policy – dispute settlement – discount rate – accountability – bank regulation *37.5 per cent*	– who formulates? – final authority – CB budget *15 per cent*	– final authority – accountability – bank regulation *20 per cent*
Policy objective	n.a.	– objective *15 per cent*	- objective - constitutional level *20 per cent*
Lending restrictions	– direct credit facility (4 components) – primary market *31.25 per cent*	– advances – securitised lending – who decides? – circle of borrowers – types of limit – maturity of loans – interest rates – primary market *50 per cent*	– direct loans – primary market *20 per cent*
External aspects	n.a.	n.a.	– ER regime – convertibility – multiple ER? – currency competition *30 per cent*

The percentages show the weights given to the group.
Sources: Cukierman (1992); Maliszewski (2000); Dvorsky (2000); Freytag (2001). See also Annex 1.

2005). Third, policy objectives are important. Central bank independence is assumed to be high, if price stability is the only or at least the primary objective of the central bank.

The most relevant aspect of CBI is the ability of the government to borrow from the central bank, as inflation in history has been a by-product of central bank lending to the government. If the bank is obliged to lend money to the government, independence can be regarded as being low. Different components can be distinguished, as the detailed categorising by Cukierman et al. (2002) shows. An important distinction is between direct lending and the bank's participation in the primary market. It makes a difference, whether central banks are obliged to give direct loans or permitted to buy government bonds on the market. Finally, external monetary relations play a major role. These include the exchange rate arrangement and capital controls, as the latter indicate if and to what extent the government grants its citizens a free choice of how to spend their money.

The index constructed by Grilli et al. (GMT 1991) and further developed by Maliszewski (2000) is distinguished into political and economic independence. The measure is based on a set of questions (see Table 2 without the distinction into economic and political independence), which are answered by yes and no (0 or 1 respectively). The higher, the score, the higher is CBI. No weighting takes place. An alternative method has been developed by Cukierman (1992). It is applied by Cukierman et al. (2002), Dvorsky (2000) and Freytag (2001). CBI (monetary commitment) is measured by 16 (Cukierman) and 13 (Freytag) components, which are normed between 0 and 1 with equidistant codings (see Cukierman 1992, p. 373-376 and Annex 2 of this paper).[17] The weighted average (index LVAW in Cukierman 1992) is calculated, resulting in an index between 0 and 1. The higher the value, the higher the CBI is. The advantage of the latter

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[17] For an economic justification of the used criteria see Freytag (2001).

method is that the outcome is more differentiated than with the GMT method. The main difference between the Cukierman index and the Freytag index is the different importance assigned to limitations to lending on the one hand (Cukierman over 50 per cent, Freytag 20 per cent) and external aspects on the other hand (Cukierman 0 per cent, Freytag 30 per cent). Apart from these differences, one also finds significant differences in the interpretation of central bank laws, as Table 3, columns 2 and 3, show. Although Dvorsky (2000) and Cukierman et al. (2002) use exactly the same index, their CBI values differ a lot. Even the ranking is not equal.

Besides legal commitment, i.e. de jure CBI, sometimes measures for actual commitment, i.e. de facto CBI, in particular turnover rates of CEOs are calculated. The reason for this procedure is that the expected negative correlation between legal CBI and inflation cannot be confirmed in empirical estimations for developing and transition countries (Berger et al. 2001; Freytag 2002a, p. 42f; Hayo, Voigt 2005). Turnover rates significantly correlate with inflation in high inflation countries (Dvorsky 2000, p. 26f). However, this result does not prove the superiority of indicators of actual CBI, as both high inflation and fast CEO turnover may well be caused by a common determinant, e.g. the inability of the government to solve the policy assignment problem. Moreover, it is not adequate for the assessment of institutional convergence, which is the convergence of formal and informal rules rather than of current behaviour. Thus, the calculation of turnover rates is not conducted in this paper.

At this stage, it seems adequate to make some remarks on the empirical evidence. In general, in advanced countries such as the core EU members, monetary commitment and central bank independence respectively is negatively correlated with inflation. However, the evidence is shaky, e.g. econometric tests we did for the sample shown in Table 3 do not provide robust evidence for the negative correlation. Therefore, we do not present this evidence here.[18] This rather loose relationship between commitment and inflation is due to the fact that monetary commitment is only one aspect of the policy assignment problem. If fiscal problems persist, the government might be tempted to solve them with monetary policy means. In particular, a dynamic perspective shows that an increasing degree of monetary commitment reduces inflation, if and only if other policy areas are also kept in order (Freytag 2002a; EEAG 2004, p. 130-133; Freytag, Schneider 2007). Although the precise effect a certain degree of commitment has on inflation is unclear, one can argue that monetary commitment with the objective of price stability makes it easier to achieve low inflation.

Consequently, measures of monetary commitment are not meant to serve the function of a norm for economic policy. Rather, the indices are designed to cover the whole possible range of central bank independence, i.e. as positive analytical tools. This implies that the highest score reflects the highest possible degree of independence. So far, no central bank has ever obtained the full score of e.g. the Cukierman index. Nevertheless, there can be a second function of an index, if it has been established well and is constructed with clearly defined and easily understandable criteria, which indeed set the frame for possible policy outcomes. In this sense, it can be seen as a benchmark. The question then would be: does the central bank law of a country meet the maximum requirements defined by the index of CBI or not?[19]

4. CBI in CEE: Empirical evidence

This section is dedicated to the calculation and discussion of CBI in Central and Eastern Europe. For a comparison, we add the figures for Bosnia Herzegovina and the ECB. The latter serves the function of a benchmark, indicating to what extent the accession candidates have already adopted the Maastricht Treaty. Interestingly, Bosnia currently seems to have the most independent central bank in Europe. We compare calculations based on the three approaches introduced above. Columns 1 through 4 of Table 3 display the calculations of these indices. Columns 5 and 6, are different, they exclusively calculate internal criteria and external aspects of monetary commitment respectively (see Annex 2 for weights). These figures are presented to show the significant differences in CBI with and without the consideration of external components of monetary commitment.

Obviously, all calculations presented here relate to individual national central bank laws enacted at a certain point in time. Thus a convergence path is difficult to see. However, as Cukierman et al. (2002, p. 242) show, CBI in transition countries has increased in those countries enacting two central bank laws in the 1990s to a great extent. Some of the figures in Table 3 also refer to elder central bank laws with a number of amendments (see below). The difference between two laws can implicitly be seen by a comparison of the figures for Bulgaria and Romania before the reform in the elder publications by Maliszewski (2000) and Cukierman et al. (2002) with our calculations (taking into account the reforms in new central laws in these countries).[20] In addition, it is self-evident that the countries in question have experienced a convergence process, as none of these had a functioning central bank before the transition period.

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[18] Admittedly, the sample is pretty small.

[19] See Dvorsky (2000, p. 23) for an interpretation of the Cukierman index along these lines, when she argues that the Maastricht Treaty has less strict requirements than the Cukierman index.

[20] The year of current central bank legislation is given in brackets behind the country in Table 3.

Table 3. *CBI in CEE*

	Maliszewski (GMT)	Dvorsky (LVAW)	Cukier-man et al. (LVAW)	Freytag[2]	Freytag internal[2]	Freytag external[2]
Bosnia (2000)	n.a.	n.a.	n.a.	0.92	0.94	0.92
Bulgaria (1997/2006)	15	n.a.	0.55[1]	0.82	0.87	0.58
Czech Republic (1991/2007)	13	0.69	0.73	0.74	0.84	0.73
Estonia (1992/2006)	13	n.a.	0.78	0.91	0.94	0.83
Hungary (2001)	10	0.78	0.67	0.71	0.65	0.89
Latvia (1992/2006)	12	n.a.	0.49	0.77	0.76	0.81
Lithuania (2006)	15	n.a.	0.78	0.74	0.67	0.83
Poland (1997/2004)	14	0.91	0.89	0.61	0.76	0.48
Romania (2004)	71	n.a.	0.34	0.61	0.59	0.54
Slovakia (1992/2005)	11	0.68	0.62	0.54	0.53	0.48
Slovenia (2002)	11	0.60	0.63	0.55	0.48	0.48
ECB (1991)	n.a.	n.a.	n.a.	0.87	0.87	0.73

The first date in paranthesis refers to the introduction of the central bank law, the second to the date of the most recent amendments). However, these amendments did only rarely change the substance of the law.

[1] based on central bank law of 1991; [2] for weights see Annex 2.

Sources: Maliszewski (2000, p. 757) ; Dvorsky (2000, p. 10) ; Cukierman et al. (2002, p. 242); own calculations based on Freytag (2001). See also Annex 1.

Many countries such as Bulgaria, Estonia, Lithuania, Poland and Romania made severe mistakes in monetary policy at the beginning of transition, suffered from huge inflation rates and finally reversed their policies (see e.g. Freytag 2002a, p. 103-112). Therefore, we use the evidence provided by the measures of CBI to assess the current state of convergence with respect to the future monetary policy in Euroland. We do not make assessments of the path so far.

Nevertheless, several conclusions can be drawn from Table 3 with respect to the state of institutional convergence. To start with a general statement, the accession candidates have made their central banks independent according to the Maastricht Treaty. Institutional convergence in a formal sense has been reached, which can also be seen by comparing the results with the degree of CBI in Euroland. Bosnia and Estonia have even made their central banks more independent than the ECB is. To summarise: the EMU-accession candidates, but also Bosnia, have adopted appropriate central bank legislation. This general result holds independently of some significant differences between the countries, which can be seen with a look at the details.

In addition, the overall picture is similar regardless of the measures applied. With respect to a ranking, the currency boards in Bosnia, Bulgaria, Estonia and Lithuania have the highest degree of CBI (with the exception of Poland in column 3 and Latvia in column 4). This common high ranking is due to the fact that the externalisation of the money creating process in a currency board arrangement provides severe constraints for the governments (e.g. Baliño, Enoch 1997; Bennett 1993). This holds concerning both limitations to lending (Cukierman et al. 2002, p. 257 and Annex 2 of this paper) and external obligations. The importance of both requirements is documented in columns 4 to 6, as the difference between internal and external commitment

(and consequently to overall CBI in column 4) is rather low, implying that both restrictions are working. Nevertheless, in this group only Bosnia and Estonia receive the maximum score with respect to limitations to lending. Lithuania and Bulgaria both allow their central bank to buy and sell government assets on the primary market.[21] In addition, there is another common property of all measures: Romania, Slovakia and Slovenia are at the lower end of the ranking, displaying the lowest degree of CBI of all CEE countries.[22] These countries do not impose severe restrictions with respect to the central bank's lending facilities to the government; the central bank is not strictly prohibited to lend money to the government, even after the introduction of new central bank legislation in 2002 (Slovenia) and 2004 (Romania). These results are encouraging in that they show that different approaches with both different methods and weighting due to economic reasoning produce generally similar results.

However, there are also striking differences.[23] The Cukierman index (column 3) assigns the major Central European countries, namely the Czech Republic, Hungary and Poland (as well as Slovakia and Slovenia) a higher degree of CBI than our own calculations (column 4), at least in comparison with the Baltics. Moreover, the difference between the "laggards" Slovakia and Slovenia with the other countries is much lower in column 3 than in our calculations. One reason for these differences lies in components with respect to the CEO and the board. Whereas Freytag (2001) focuses on the CEO's expertise, Cukierman et al. (2002) put emphasis on the term length, other offices and the question of who appoints board members. High scores in this area on which

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[21] In Bulgaria, this reflects the fact that the currency board is not an orthodox one (Nenowsky, Hristow 2002).

[22] The results for Romania in column 1 and Bulgaria in column 3 reflect out-dated central bank legislation.

[23] We restrict the following paragraphs to columns 3 and 4.

Table 4a. *Convertibility restrictions in selected current members and accession countries in 2006*

	A	F	P	Esp	Bu	Ee	Pol	Ro	SR	Slo
Controls on payments for transfers and sinvisibles					*		*		*	
Controls on export proceeds					*					
Controls on capital transactions										
– market securities	*	*	*	*			*		*	
– money market instruments	*	*	*	*			*	*		
– collective instruments securities	*	*	*	*			*		*	*
– derivatives	*		*	*			*	*		
– commercial credits										
– financial credits	*		*	*	*		*			
– guarantees					*		*			
– FDI	*	*	*	*	*		*		*	*
– liquidations of FDI										
– real estate transactions	*		*	*	*	*	*	*	*	*
– personal capital transactions					*	*	*			
Provisions on capital transactions	*		*	*	*	*	*	*	*	*
– commercial banks	*	*	*	*	*	*	*		*	*

A = Austria, F = France, P = Portugal, Esp = Spain, Bu = Bulgaria, Ee = Estonia, Pol = Poland, Ro = Romania, SR = Slovakia, Slo = Slovenia.
Source: IMF (2006).

countries placed so much emphasis in their central bank laws, cause the Cukierman index to be higher.[24]

Similarly, the higher weight (50 per cent) given to limitations on lending by Cukierman et al. (2002) raises the overall figures, as long as the limitations to lending are reasonably strict. This is the case in the major countries, with the currency boards naturally following much stricter rules. An extreme case is Poland, which has introduced an Article in its Constitution, prohibiting public budget financing through the National Bank of Poland.[25] This setting is unique and has lead to a full score of half of the index (only 20 per cent of the index in our calculations). The differences in weighting individual components are visualised in columns 2, 3 and 4 of Table 3. However, columns 5 and 6 (internal and external aspects of our index of commitment) reveal that the deviation of the two measures are mainly due to one major difference in the construction of the index, namely that the Cukierman index does not include international monetary relations, whereas our calculation does. If one considers only internal aspects of our index, the deviations are rather small (columns 3, 4 and 5). The interpretation of the central bank legislation in accession countries is similar. This changes slightly when external aspects are taken into account.

In the remainder of the section, we discuss the general role of external aspects by comparing the external components of the index of commitment of the accession candidates with the EMU members. The mainly positive assessment of CBI in accession countries is slightly qualified by this exercise. One has to look at single members, as external aspects are not harmonised in Euroland. Thereby, we want to analyse whether the striking progress CEE countries have made concerning CBI, is still prevalent once external aspects are also included. We start with a short discussion of the components chosen (see Annex 1). The component *extern* shows the exchange rate regime. A higher score implies higher commitment, which reflects the function of fixed exchange rates as nominal anchor in transition countries. However, it has to be emphasised that this component is most important for countries

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[24] This may indeed partly reflect some influence on legislators by the Cukierman index. See section 3, last paragraph.

[25] Poland had some difficulties to finance the public budget until the late 1990s.

Table 4b. *Convertibility restrictions in selected current members and accession countries in 2002*

	A	F	P	Esp	Bu	Ee	Pol	Ro	SR	Slo
Controls on payments for transfers and invisibles					*		*	*	*	
Controls on export proceeds					*		*	*	*	
Controls on capital transactions										
– market securities		*	*		*		*	*	*	*
– money market instrments		*	*		*		*	*	*	*
– collective instruments securities		*			*		*	*	*	*
– derivatives				*	*		*	*	*	*
– commercial credits				*			*	*		
– financial credits					*		*	*		
– guarantees					*		*	*		
– FDI	*	*	*	*	*	*	*		*	*
– liquidations of FDI				*						
– real estate transactions	*			*	*	*	*	*	*	*
– personal capital transactions					*	*	*	*		
Provisions on capital transactions										
– commercial banks	*		*	*	*	*	*	*	*	*
– institutional investors	*	*	*	*		*	*			*

A = Austria, F = France, P = Portugal, Esp = Spain, Bu = Bulgaria, Ee = Estonia, Pol = Poland, Ro = Romania, SR = Slovakia, Slo = Slovenia.
Source: IMF (2002).

with a long tradition of inflation, not so much for industrialised countries with a stability record, such as Euroland or the US. It is also no longer important for EMU accession candidates, except for being a nominal criterion. Therefore, and as it is impossible to decide the question of whether or not an exchange rate fix is better or worse for achieving price stability than flexible exchange rates without a closer look at the respective economy (Freytag 2002b),[26] the weight of the exchange rate regime in column 6 is low (10 per cent).

The main component is *conv*, reflecting convertibility restrictions (50 per cent in column 6). The third component is *comp*, showing if and to what extent governments allow their citizens to use foreign currencies. A high grade signals that the government is considering stability as desirable, even at the expense of a seigniorage loss, if foreign currency replaces the domestic currency. All accession (and EMU member) countries with the exception of Hungary and Bosnia allow their citizens to hold foreign currency in cash and on accounts. Only the two exceptions allow that foreign currencies are also used as means of payments. Finally, *mult* is indicating whether or not multiple exchange rates are used. None of the countries in question today applies multiple exchange rates.[27]

Comparing columns 4, 5 and 6 in Table 3, reveals that in countries that run a currency board the differences between the outcomes are the smallest. A currency board requires a nominal anchor (plus 100 per cent coverage of the monetary basis by forex) and full convertibility to be workable. The only exception is Bulgaria, which runs a heterodox currency board with some flexibility for monetary policy left (Nenowsky, Hristow 2002). Poland, Romania, Slovakia and Slovenia have set up convertibility restrictions, which the latter two countries have reduced significantly since 2002 (Tables 4a and 4b). In particular in case of Poland the deviation from internal components is huge and explains why Dvorsky (2000) as well as Cukierman et al. (2002) assign a much higher degree of CBI to the country than our calculations do. In addition, these countries have a flexible exchange rate regime, which at least can be interpreted as the perceived need for more flexibility (discretion) than under fixed exchange rates. The inclusion of external aspects indeed shows that there are differences with respect to convertibility, which may be overlooked by a concentration on domestic aspects of CBI. The

[26] See also the general discussion of this issue in Buiter, Grafe (2002).

[27] Again, this component is added to the index to cover a wider range of monetary regimes, today it seems to be unnecessary to look for multiple exchange rates in Europe.

convertibility restrictions are further analysed in comparison with EMU member countries.

The coding chosen for this component does not consider and differentiate all possible restrictions one can think of. Thus, we will also refer to IMF categories (IMF 2002; 2006).[28] In Tables 4a and 4b we use this categorising to compare convertibility restrictions of selected current and potential EMU member countries over time, namely between 2002 and 2006. We do not consider those countries that do not or at least virtually do not restrict convertibility and a few of the others.

There are a number of convertibility restrictions shown in the tables. Almost all accession countries as well as the EMU members in Tables 4a and 4b restricted foreign direct investment (FDI) and real estate purchases by foreigners in 2002 more than in 2006.

Some countries restrict portfolio investments, and some even control payments related to the current account (Bulgaria and Slovakia). This was not the case in Euroland, but changed in the countries in question. The evidence presented in Tables 4a and 4b shows a convergence process. It also shows that some established members introduced controls, which in the case of Austria are mainly a reaction on the blurring effect of financial markets (Masciandaro 2004). It thirdly shows that this convergence process is not happening in all countries. Particularly Poland still does not match the EMU average. This holds even when considering the fact that in comparison to the year of the Euro introduction in 2002, many of the convertibility restrictions have been removed (IMF 2002; 2006). This assessment remains also valid, if one takes into account that the restrictions documented by an asterisk often imply weaker controls such as requirements for authorisation. Still, it is a fact that one major accession candidate, namely Poland, has set up a higher than average number of restrictions and approval requirements.

This evidence can be interpreted as follows: most of the accession candidates have made a huge progress with respect to institutional convergence both internally and externally. However, some still have to change their monetary regime in order to fully qualify for EMU in a substantial and material sense. Even if the formal requirements of the Maastricht Treaty are met, part of the policy assignment is not appropriate to foster real and nominal convergence. The most striking example is Poland, where on the one hand limitations to lending are perfectly incorporated into the legal structure; on the other hand convertibility is restricted rather heavily. It has to be mentioned that Tables 4a and 4b covers less than half of the CEE accession countries. At the same time, the majority of them already have introduced full current account and capital account convertibility.

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[28] The index of commitment is constructed more generally to generate data for as many countries as possible within a huge time span. However, it is based on the IMF (2002) data.

5. Conclusions: CEE close to institutional convergence

The paper shows that the accession candidates from Central and Eastern Europe have made significant progress in their ambitions to qualify for EMU accession in recent years. This holds very much with respect to nominal convergence, in particular if one recalls the considerable stability problems most of these countries had less than a decade ago. The most demanding problem in these countries was inflation, e.g. in the Baltic countries inflation rates hit 1,000 per cent in the early 1990s and was at least on a two-digit level until the late 1990s. Inflation rates in CEE since have been (sustainably) reduced to one-digit figures. The fiscal criteria probably will be met by almost all countries; only recently the Czech Republic, Hungary and Poland considerably missed the deficit criterion (Table 1). With respect to real convergence, especially the catching up in per capita GDP, progress can be observed, albeit a smaller one. This is unsurprising; given the low level the countries had reached in the early 1990s. Nevertheless, most countries are above 50 per cent of EU average. Others such as Bulgaria and Romania still have some way to go to reach this level.

Both nominal and real convergence of the CEE accession candidates are under close scrutiny. The Maastricht Treaty seems to be strict regarding EMU entry – only after the Council has decided that a country has met the nominal criteria, it will join EMU. Nevertheless, it cannot be excluded that the decision, which country will join and which will remain a pre-in will not only be driven by the formal criteria. Imagine that at some point in the future only one or two smaller countries meet the nominal convergence criteria, whereas bigger ones (slightly) miss them. Some years ago, the Baltic states indeed performed best with respect to nominal convergence. Experience with the nominal convergence of the founding members in 1998 suggests that under political pressure the decision about EMU membership will be biased towards more countries joining the Union than those strictly meeting the criteria.

In addition, the Balassa-Samuelson effect plus a likely real appreciation of new EU members due to previously unexperienced capital inflows and transfers from structural funds may give perverse incentives for governments to restrict economic growth hoping that this leads to lower inflation. Such a *weighing-in* behaviour will cause economic costs, which should be avoided. Again, there may be political pressure to ease EMU accession.

Therefore, we advocate considering a third type of convergence, namely institutional convergence. The Maastricht Treaty has also set clear rules for central bank independence. The economic reason for the importance of institutional convergence is that it helps to foster the

other two types of convergence. It also gives evidence about the governments' ability to organise a stability oriented economic policymaking process. This will be important, if the decision about EMU accession is made independent of the criteria. If institutional convergence is high, such a deviation does not necessarily imply the danger of growing instability in Euroland, as the countries attitude towards policy making is similar.

There is widespread agreement in the literature that CBI in Central and Eastern Europe is high. The results cited in this paper as well as those calculated here, support this view (Table 3). Apart from two accession candidates and Slovenia, were the relations between government and central bank with respect to central bank loans to the government are not well-defined, all candidates plus Bosnia-Herzegovina have made their central banks very independent. It remains to be seen whether the lack of limitations to lending in Slovenia provide a disadvantage for EMU.

Despite the good institutional performance of accession candidates, there is one caveat, namely that the external monetary relations are not covered by most measures of CBI. We add components that consider these relations with a focus on convertibility restrictions and the role of foreign currencies in the country (Table 2) and calculate an index of monetary commitment. The degree of monetary commitment in three accession countries and Bulgaria and Romania slightly changes to the worse, when convertibility restrictions (Tables 4a and 4b) are considered. The conclusion of this evidence is straightforward: besides nominal (and real) convergence, economic policy should also be directed at institutional convergence, in particular at a dismantling of convertibility restrictions prior to EMU accession.

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Annex 1. *Index of monetary commitment*

Criterion	Component	Explanation	Numerical codings
Stated objectives of monetary policy	*obj*	1. Price stability only goal	1.00
		2. Other objectives mentioned	0.66
		3. Other objectives equally important	0.33
		4. No goals for monetary policy	0.00
Locus of legal commitment	*const*	1. Constitution	1.00
		2. Central bank law	0.66
		3. Decree	0.33
		4. Not fixed at all	0.00
Discretionary power belonging to the government	*gov*	1. No power left to the government	1.00
		2. Exchange rate only issue to be consulted between government and monetary authority	0.66
		3. Exchange rate regime completely left to government	0.33
		4. Government may override central bank as regards monetary policy	0.00
Conditions of appointment and dismissal of monetary CEO	*ceo*	1. CEO must be a reputed expert	1.00
		2. No expertise demanded	0.00
	diss	1. Appointment with fixed term and dismissal only after criminal offenses and bad performance	1.00
		2. No rules for dismissal	0.50
		3. Dismissal unconditioned or linked to resignation of governments and ministers	0.00
Conditions of lending to the government	*limcred*	1. No central bank credit allowed	1.00
		2. Central bank credit allowed conditionally	0.50
		3. Central bank credit allowed unconditionally	0.00
	limprim	1. Central bank is not allowed to purchase public bonds on the primary market	1.00
		2. Central bank is allowed to purchase public bonds in hard currency on the primary market	0.66
		3. Central bank is allowed to purchase public bonds in any currency on the primary market	0.33
		4. No limitations on credit activities	0.00
Supervision and regulation of the financial system by the central bank	*reg*	1. Supervision and regulation is assigned to a separated body	1.00
		2. Supervision and regulation is assigned to central bank	0.50
		3. No supervision and regulation	0.00
Accountability of the central bank	*acc*	1. Obligation to inform the public	1.00
		2. Obligation to inform the parliament in public hearings	0.66
		3 Obligation to inform the government without publicity	0.33
		4. No accountability	0.00
External pledges of the government	*extern*	1. Exchange rate fixed to a hard currency and money base fully backed with foreign reserves	1.00
		2. Exchange rate fixed	0.75
		3. Crawling peg	0.50
		4. Managed floating	0.25
		5. Free floating	0.00

Convertibility restrictions	conv	1. Full convertibility	1.00
		2. Partial convertibility	0.75
		3. Convertibility for current account transactions only	0.50
		4. Convertibility for capital account transactions only	0.25
		5. No convertibility	0.00
	mult	1. One exchange rate	1.00
		2. Multiple exchange rate	0.00
Interactions with other currencies	comp	1. A hard currency can be used for all transactions	1.00
		2. A hard currency can be used for some transactions, others excluded	0.66
		3. A hard currency may be held	0.33
		4. No holdings or transactions in hard currencies allowed	0.00

Source: Freytag (2001, p. 198-199), own changes.

Annex 2. *CBI in CEECS: components (Freytag) in detail*

	obj	con	gov	ceo	diss	lim1	lim2	reg	acc	ext	conv	com	mul	Index
	Internal aspects							External aspects						
Bosnia	1.00	0.66	1.00	1.00	1.00	1.00	1.00	0.50	1.00	1.00	1.00	0.66	1.00	0.9240
Bulgaria	1.00	0.66	1.00	1.00	1.00	1.00	0.66	0.50	1.00	1.00	0,50	0.33	1.00	0.8235
Czech Republic	0.66	0.66	0.66	1.00	1.00	1.00	1.00	0.50	1.00	0.00	1.00	0.33	1.00	0.7395
Estonia	1.00	0.66	1.00	1.00	1.00	1.00	1.00	0.50	1.00	1.00	1.00	0.33	1.00	0.9075
Hungary	0.66	0.66	0.66	0.00	1.00	1.00	0.33	1.00	0.33	0.75	1.00	0.66	1.00	0.7055
Latvia	1.00	0.66	1.00	0.00	1.00	1.00	0.33	0.50	1.00	0.75	1.00	0.33	1.00	0.7655
Lithuania	0.66	0.66	1.00	0.00	1.00	1.00	0.33	0.50	0.66	1.00	1.00	0.33	1.00	0.7395
Poland	0.66	0.66	0.33	0.00	1.00	1.00	1.00	0.50	1.00	0.00	0.50	0.33	1.00	0.6065
Romania	1.00	0.66	1.00	0.00	1.00	0.50	0.00	0.50	1.00	0.50	0.50	0.33	1.00	0.6075
Slovakia	0.66	0.66	0.66	1.00	1.00	0.50	0.00	0.50	1.00	0.00	0.50	0.33	1.00	0.5395
Slovenia	0.66	0.66	1.00	0.00	0.50	0.50	0.33	0.50	0.66	0.00	0.50	0.33	1.00	0.5145
ECB	0.66	1.00	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.33	1.00	0.8655
Weights	0.1	0.1	0.1	0.05	0.05	0.1	0.1	0.05	0.05	0.1	0.1	0.05	0.05	1
Weigths – internal	0.2	0.1	0.1	0.05	0.05	0.2	0.2	0.05	0.05					1
Weights – external										0.1	0.5	0.15	0.25	1

Source: IMF (2002), components based on Annex 1.