DEUTSCHE
BUNDESBANK
EUROSYSTEM

Do we really know that flexible exchange rates facilitate current account adjustment? Some new empirical evidence for CEE countries

Sabine Herrmann

Discussion Paper
Series 1: Economic Studies
No 22/2009

Deutsche Bundesbank, Wilhelm-Epstein-Strasse 14, 60431 Frankfurt am Main,
Postfach 10 06 02, 60006 Frankfurt am Main

Tel +49 69 9566-0
Telex within Germany 41227, telex from abroad 414431

Please address all orders in writing to: Deutsche Bundesbank,
Press and Public Relations Division, at the above address or via fax +49 69 9566-3077

Internet http://www.bundesbank.de

ISBN 978-3–86558–547–9 (Printversion)
ISBN 978-3–86558–548–6 (Internetversion)

Abstract:

This paper examines the relationship between the exchange rate regime and the pace of current account adjustment. The panel data set we refer to includes 11 catching-up countries from central, eastern and south-eastern Europe between 1994 and 2007. The exchange rate regime is measured by a continuous z-score measure of exchange rate volatility proposed by Gosh, Gulde and Wolf (2003). Based on a basic autoregression estimation, the results indicate that a more flexible exchange rate regime significantly enhances the rate of current account adjustment.

Keywords: Current Account Adjustment, Exchange Rate Regime, Central and Eastern Europe

JEL-Classification: F 32, F 31, O 52

Non technical summary

Deviations of the current account balances from their long-term equilibriums are often regarded as a problem among economists. For instance, according to the IMF, the Chinese peg to the Dollar is said to be a major reason for the existing global imbalances. However, from a theoretic point of view, it cannot be taken for granted that the nominal exchange rate regime has an important bearing on current account balances, as in the long-run the latter should be primarily determined by the real exchange rate. The underlying paper analyses empirically for a sample of central, eastern and south-eastern European economies whether and to what extent a more flexible exchange rate regime promoted the reversion of their current account balances to a long-term steady state. The flexibility of the exchange rate regime is measured by the exchange rate volatility within one year. The analysis suggests that a greater exchange rate volatility decreases the persistency of current account imbalances.

These results hold when additional control variables or indirect influences of the exchange rate regimes, for example via their impact on the real credit growth, are introduced. A dynamic instrumental variable framework also indicates that a more flexible exchange rate regime causes current account imbalances to adjust at a more rapid pace. A vector error correction model confirms that the adjustment process of the current account balance still depends on the exchange rate volatility even if we differentiate explicitly between a long-run structural equation and a short-run adjustment process.

This outcome is in contrast to the findings of Chinn and Wei (2008) who cannot robustly confirm that more flexible de facto exchange rate regimes tend to lead to a more rapid adjustment of current account balances to their long-run equilibriums. A comparison with this study indicates that the different findings are not only an issue of differences in the country sample, rather the methodology used to control for the exchange rate regime seems to matter for the outcome.

Nicht-technische Zusammenfassung

Abweichungen der Leistungsbilanz von ihrem langfristigen Gleichgewicht werden in der wirtschaftspolitischen Diskussion vielfach als Problem beschrieben. In diesem Zusammenhang hat z.B. der IWF die Bindung der chinesischen Währung an den US Dollar als einen wesentlichen Grund für die globalen Ungleichgewichte genannt. Aus theoretischer Sicht ist allerdings nicht selbstverständlich, dass das Wechselkursregime hier eine entscheidende Rolle spielt, da langfristig für die Entwicklung der Leistungsbilanzen vor allem die realen Wechselkurse ausschlaggebend sind. Das vorliegende Papier untersucht empirisch für eine Auswahl von Mittel-, Ost- und Südosteuropäischer Volkswirtschaften, ob und in welchem Ausmaß ein flexibleres Wechselkursregime tatsächlich die Anpassung ihrer Leistungsbilanzen an ein langfristiges Gleichgewicht gefördert hat. Dabei wird als Maß für die Flexibilität eines Regimes die Volatilität der Wechselkurse innerhalb eines Jahres herangezogen. Die Analyse deutet darauf hin, dass die Flexibilität der Wechselkursregime tatsächlich die Persistenz von Leistungsbilanzungleichgewichten vermindert.

Dieses Ergebnis erweist sich als robust, wenn zusätzliche Kontrollvariablen oder indirekte Einflüsse von Wechselkursregimen, d.h. z.B. deren Auswirkungen auf das Kreditwachstum, berücksichtigt werden. Auch im Rahmen eines dynamischen Instrumenten-Variablen-Ansatzes bestätigt sich, dass ein flexibleres Wechselkursregime den Grad der Leistungsanpassung erhöht. Die Schätzung eines Fehler-Korrektur-Modells macht deutlich, dass der Anpassungsprozess der Leistungsbilanz auch dann von der Wechselkursvolatilität beeinflusst wird, wenn zwischen einem langfristigen strukturellen Zusammenhang und einem kurzfristigen Anpassungsprozess differenziert wird.

Das Papier kommt somit zu anderen Ergebnissen als Chinn und Wei (2008), wonach es keine robusten Hinweise darauf gibt, dass de facto flexiblere Wechselkursregime die Leistungsbilanzanpassung beschleunigen. Ein Vergleich mit dieser Studie deutet darauf hin, das die divergierenden Ergebnisse nicht nur eine Folge verschiedener Ländersamples sind, sondern dass die Methode, die zur Klassifizierung der Wechselkursregime herangezogen wird, von großer Bedeutung für die Resultate ist.

Contents

1	Introduction	1
2	Literature Review	4
3	Model Specification	6
4	Empirical Results	9
5	Robustness Checks	12
5.1.	Instrumental Variable Approach	12
5.2.	Exchange Rate Regime Classification Approach	14
5.3.	Vector Error Correction Model	15
6	Conclusion	17
References		18
Data Annex		21

List of Tables

1	Determinants of current account adjustment – FGLS estimation results	10
2	Determinants of current account adjustment – IV estimation results	13
3	Determinants of current account adjustment – VEC estimation results	16

Do we really know that flexible exchange rates facilitate current account adjustment? Some new empirical evidence for CEE countries*

1. Introduction

In recent years, large and persistent current account imbalances emerged on a global scale. The risks attached to these developments have been discussed intensively among economists. So far, there is still no consensus why *global imbalances* increased and whether they are causal for the recent economic and financial turmoil.[1] Irrespective of this discussion, however, deviations of the current account balances from their long-term equilibriums raise important adjustment issues. Greater exchange rate flexibility is often regarded as a means to facilitate the adjustment of current account imbalances over time. Thus, policy recommendations for a more flexible exchange rate regime as a tool to unwind current account imbalances proliferated recently. For example, according to US authorities and the IMF[2], the Chinese peg to the Dollar is said to be a major reason for the persistence of global imbalances. Likewise, a change in the fixed exchange rate regimes is sometimes considered a remedy to alleviate high current account deficits in the Baltic countries.

However, from a theoretic point of view, the issue is not as clear as conventional wisdom suggests. In the long run, standard economic theory does not give any indication that the nominal exchange rate regime should have a bearing on current

* The views expressed in this paper are those of the author and do not necessarily represent those of the Deutsche Bundesbank. The paper has benefited from valuable comments by Jörg Breitung, Menzie Chinn, Ulrich Grosch, Heinz Herrmann, Axel Jochem, Russell Kincaid, Jens Ulbrich, Shang-Jin Wei, Adalbert Winkler as well as participants of a seminar at Deutsche Bundesbank and the CEUS workshop at the WHU Koblenz. Corresponding author: sabine.herrmann@bundesbank.de.

[1] See e.g. Clarida (2005), Bernanke (2005) as well as Dooley, Folkerts-Landau and Garber (2003/2004). For example, one strand of the literature claims that an increasing financial integration may contribute to the build-up of large current account imbalances, especially when underlying convergence forces are at work. Indeed, Blanchard und Giavazzi (2002) found evidence that the link between net capital flows and income levels has strengthened under EMU. In the same spirit, Fagan und Gaspar (2007) have shown that EMU led to major increases in the current account deficits of those members that have been expected to grow relatively quickly for convergence reasons. Furthermore, Abiad, Mody and Leigh (2007) as well as Herrmann and Winkler (2008) confirmed that a higher degree of financial integration leads to a wider dispersion of current account balances within Europe.

[2] IMF Staff report for the 2006 Article IV Consultations.

account balances, instead, the latter are determined by real factors, most notably the real exchange rate. However, with respect to adjustment dynamics, in the short run, the real exchange rate - taking into consideration multiple price rigidities - may depend predominantly on nominal exchange rate movements. As a result, the exchange rate regime could indeed affect current account adjustment.[3]

The recent literature provides little empirical evidence on the relationship between the exchange rate regime and the speed of current account adjustment.[4] One major exception is the paper of Chinn and Wei (2008). Using time series as well as panel estimates, they cannot confirm that more flexible de facto exchange rate regimes tend to lead to more rapid adjustment of current account balances to long-run equilibriums. These results hold regardless of which exchange rate regime classification they use. In line with the work of Chinn and Wei (2008), this paper analyses to what extent a more flexible exchange rate regime would promote the reversion of the current account to its long-term steady state. However, we go beyond the work of Chinn and Wei (2008) in several respects.

First, Chinn and Wei (2008) found some evidence that the results were in accord with the conventional wisdom, but were not robust or at least non-linear. However, these non-linearities may result from the fact that the exchange rate regimes in their paper are measured by dummy variables proxying exchange rate flexibility in a rather aggregated way.[5] Alternatively, according to Arratibel, Furceri and Martin (2008), we introduce a

[3] A flexible exchange rate regime might affect the external side of the economy in two ways, namely via the trade balance as well as via a valuation effect. In case of a nominal depreciation, according to Lane (2008), this might offer a double benefit. The valuation effect holds true if foreign assets are predominantly in foreign currency and external liabilities in domestic currency. For example, Gourinchas and Rey (2007) found a substantial role for the valuation channel in the adjustment dynamics of the US. However, in emerging markets the valuation effect usually is of minor importance or could even be negative. On the other hand, a floating exchange rate might not always attenuate shocks, and, furthermore, may be subject to political manipulation.

[4] By contrast, there are investigations which stick to the level of the current account balance and not to the current account adjustment process. For instance, the findings of Arratibel et al. (2008) suggest that a higher exchange rate volatility is associated with a lower current account deficit. Likewise, Herrmann and Winkler (2008) showed that fixed exchange rate regimes are associated with deteriorating current account balances.

[5] The Levy-Yeyati and Sturzenegger Index (see Levy-Yeyati and Sturzenegger, 2003b) aggregates the regimes from 1 to 5 (Chinn and Wei used a revised index ranging from 0 to 3) and the Reinhart and Rogoff Index (see Reinhart and Rogoff, 2004) ranges from 1 to 14. As a result, in some categories there

continuous variable representing the exchange rate regime, namely the degree of exchange rate volatility[6]. The *z-scores* measure of de facto exchange rate volatility proposed by Gosh, Gulde and Wolf (2003) reflects the actual behaviour of the exchange rate regime more precisely than a discrete variable. Furthermore, we avoid the problems inherent to a dummy variable approach which are insignificant results and an arbitrary classification of the dummies especially for intermediate regimes etc. On the other hand, this approach may increase the endogeneity problem, implying that in periods of rapid current account adjustment, greater exchange rate volatility may be observed. This endogeneity problem has to be checked in the empirical approach.

Second, there is a high degree of heterogeneity in the data used by Chinn and Wei (2008) and standard errors behave differently in several sub-samples. Thus, the underlying paper estimates a more homogeneous sample. As exchange rate considerations are likely to figure more prominently in emerging market economies regardless of the specific policy regime, the paper focuses on emerging economies in central, eastern and south-eastern Europe.[7]

Third, we try to identify indirect effects of the exchange rate regime. For instance, in line with Rahman (2008), we assume that exchange rate regimes differ with respect to their impact on credit growth and that such differences may determine current account dynamics as well.

The analysis suggests that the exchange rate regime significantly influences the pace of current account adjustment, ie greater exchange rate flexibility decreases the persistency of the current account imbalance or increases its rate of reversion to its long-term equilibrium. These results hold true when several robustness checks are performed and are in contrast to the outcome of Chinn and Wei (2008). A closer look at the forces driving the results by these authors reveals that the highly aggregated way in which

---

are only a few observations. Furthermore, especially for "intermediate regimes" classification may be quite challenging.

[6] Arratibel, Furceri and Martin (2008) use this measure in order to estimate the relationship between the de facto exchange rate regime and key macroeconomic variables. Exchange rate volatility is also included in the de facto exchange rate regime indicator of Levy-Yeyati and Sturzenegger (2003b), but transformed into a dummy variable.

exchange rate flexibility is captured in their paper explains to a significant degree the diverging outcomes. Thus, the methodology used to measure the exchange rate regime seems to matter.

The rest of the paper is organised as follows. *Section 2* reviews the most important literature. *Section 3* specifies the model and provides information on the data. *Section 4* summarises the main results of the empirical investigation. *Section 5* presents some robustness checks. *Section 6* concludes.

2. Literature Review

The literature on current account adjustment goes back to the open-economy macroeconomics and the inter-temporal approach of the current account (see e.g. Sachs, 1982). A large empirical body of this literature focus on current account reversals (Milesi-Ferretti and Razin, 1998 as well as Freund, 2000). Generally, they conclude that the current account has a tendency to revert to its means value while the speed of adjustment to this long-run equilibrium being quite heterogeneous across countries.

Some of these studies claim that the size of the current account imbalances matter for the adjustment. Based on econometric evidence, Freund and Warnock (2005) suggest that current account adjustment is non-linear with faster adjustment for larger initial deviations from the equilibrium. In line with theses findings, Clarida, Goretti and Taylor (2007) pointed out that surplus or deficit regimes show different speeds of adjustment to their long-run means. At the same time, they found a significant cross country variation in the size of the estimated thresholds.

Ju and Wei (2007) also control for threshold effects by introducing a threshold autoregressive model (TAR). In addition, they present a micro foundation with a clear focus on domestic labour market institutions. It depends on the mobility of labour whether the economy´s adjustment to a shock goes through an intra-temporal channel (a

[7] See Ho and McCauley (2003).

change in the composition of goods) or an inter-temporal channel (a change in the current account balance). They found that the more rigid the labour market, the slower the speed of adjustment of the current account balances towards its long-run equilibrium.

As far as I know, Chinn and Wei (2008) were the first to examine the relationship between the exchange rate regime and the current account adjustment systematically. They found no significant and robust relationship and concluded that the real exchange rate adjustment is not systematically related to how flexible a country´s nominal exchange rate is. Similarly, Decressin and Stavrev (2009) figured out that there are differences in current account dynamics between euro-area countries and other advanced economies, however, that theses differences do not appear related to different exchange rate dynamics. By contrast, Gosh, Terrones and Zettelmayer (2009) come to the conclusion that large current account reversals very rarely occur under flexible exchange rate regimes and when they happen they involve much lower initial imbalances. Altogether, allowing for threshold effects, they come to the conclusion that exchange rate regimes seem to be highly relevant for current account dynamics.

Thus, the empirical results are quite mixed so far. On the one hand, no significant relationship between the exchange rate regime and current account dynamics could be confirmed. On the other hand, there is some support for the *Friedman Hypothesis* (Friedman, 1953) claiming that flexible exchange rates produces corrective movements before tensions can accumulate and a current account crisis develops. The underlying paper adds to the current literature and tries to provide additional empirical evidence on this issue.

3. Model Specification

In line with Chinn and Wei (2008), we estimate the rate at which current account balances revert to their mean values using a basic autoregression. The expression *reversion* means the adjustment of the current account balance from any default value to a mean value which depends on the underlying equation. It is assumed that this mean value corresponds to the long-run equilibrium. In *Section 5* - within the scope of the robustness checks - it will be verified whether this can be confirmed. So far, the approach implies that there is a long-run equilibrium, however, does not impose the restriction that the long-run value of the current account to GDP ratio will be zero. Furthermore, these long-run values are country specific which is consistent with the outcome of Kray and Ventura (2000).

The sample covers 11 countries in central, eastern and south-eastern Europe, namely the new EU Member States Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia as well as the candidate countries Croatia and Turkey (CEE). The analysis is based on annual data from 1994 to 2007.[8] The empirical investigation refers to the following equation:

$$CAGDP_{it} = \rho_0 + \rho_1 CAGDP_{it-1} + \rho_2 CAGDP_{it-1} * REGIME_{it-1} + \rho_3 REGIME_{it-1} + \rho_4 CAGDP_{it-1} * X_{it} + \rho_5 X_{it} + \varepsilon_{it} \quad (1)$$

where CAGDP is the current account to GDP ratio in percent with ρ_1 the autoregressive coefficient[9], REGIME the exchange rate regime based on an exchange rate volatility measure, X a set of control variables, and ε_{it} the error term. (*For current account developments in the countries under review see the charts in Annex 1*).

As mentioned above, the approach raises the issue of endogeneity. The exchange rate volatility may be largely endogenous, ie a consequence of current account developments, rather than an exogenous variable. As a result, we cannot exclude that the direction of causality may extend from the current account to the degree of exchange

[8] For a detailed description of the estimated variables and data sources, see the Annex.
[9] An autoregressive term of order one seems to be sufficient for the annual data used in the study.

rate volatility and not vice versa.[10] Endogeneity is not an easy problem to deal with. In a first step, we lag the z-scores of the exchange rate volatility variable in all estimated equations. In addition, we take account of the issue in a more technical sense by referring to an IV-estimator according to Anderson and Hsiao, 1981 (*see section 5.1*).

Three different models are estimated.

1. The *basic model* focuses exclusively on the effects of the exchange rate regime on the reversion of the current account balance. The null hypothesis is that a less rigid exchange rate regime - measured by a higher exchange rate volatility[11] - facilitates current account adjustment as nominal exchange rate flexibility dominates the dynamics of the real exchange rate in the short run.[12]

   For the exchange rate volatility measure we refer to the z-score index proposed by Gosh, Gulde and Wolf (2003) which is in line with Arratibel et al. (2008) and De Grauwe and Schnabl (2004).[13] Exchange rate fluctuations around a constant level and around an appreciation or depreciation path are taken into account in the following equation:

$$z_t = \sqrt{\mu_t^2 + \sigma_t^2} \qquad (2)$$

   where μ_t is the arithmetic average of month-to-month percent changes in the nominal exchange rate in year t, and σ_t the standard deviation of the month-to-

[10] According to Friedman (1953) exchange rate volatility is a symptom rather than a cause of economic imbalances. For example, Clarida, Goretti and Taylor (2006) found statistically significant increases in exchange rate volatility during current account deficit adjustment regimes for the US, Japan and Germany and recommend a joint modelling of exchange rates and current account.

[11] It is sometimes argued that the volatility of the exchange rate reflects more of the size of a shock faced by the economy than the nature of the exchange rate regime. However, if the exchange rate volatility is the response of different countries to *one single* shock, it reflects just the parameter we are looking for: the degree of exchange rate flexibility depending on the regime. There might be a problem when different countries are hit by *different* shocks and these different shocks are the reason for the different degrees of exchange rate volatility. However, as the sample comprises a relatively homogeneous group of emerging European countries, it is justifiable to believe that common shocks are prevailing.

[12] Mussa (19986) showed that flexible regimes do indeed display a much higher real exchange rate variability than pegged regimes.

[13] The z- score measures in the different central, eastern and south-eastern European countries and over time fit quite well to the institutional exchange rate regime classifications. In 2008, the exchange rate volatility was lowest in the currency board regimes Bulgaria, Estonia, Latvia and Lithuania and highest in Turkey which is a free-floating regime nowadays.

month percent changes of the nominal exchange rate of the year t. Instead of using the nominal exchange rate vis-à-vis the euro, we refer to a nominal effective exchange rate.[14] (*For the z-score indices in the countries under review see the charts in Annex 2*).

2. In the *Chinn/Wei Model*, in line with Chinn and Wei (2008), we check for other potential determinants of current account adjustment. We introduce TRADE as a trade openness indicator measured by the sum of imports and exports divided by GDP. The idea is that in economies with greater trade openness, trade balances react more quickly to changes in the real exchange rate and, thus, a faster return of the current account balance to its long-term equilibrium can be expected. By contrast, greater openness of the financial account makes a country more vulnerable to external shocks which may result in more frequent current account disequilibriums. We include FINANCE as a measure of financial openness according to the Chinn/Ito index of financial liberalisation (Chinn and Ito, 2008).[15] In addition, in line with Chinn and Wei (2008) we check for the inflation rate (INFLATION) and expect a negative coefficient as higher inflation should go hand in hand with higher price volatility and, thus, less sticky adjustment mechanisms.[16]

3. In an *indirect effects model*, we extend the list of control variables to indicators which seem to be relevant to catch the indirect effects of the exchange rate regime in an emerging market context.[17] In line with Rahman (2008) and Bakker (2008) we check for an indirect relationship between the exchange rate regime and current account dynamics based on the idea that exchange rate regimes differ with respect to their degree of real credit growth (CREDIT). For instance, a pegged

[14] Alternatively, De Grauwe and Schnabl (2004) compute a measure of both euro and dollar pegging as a rough indicator of the nominal effective exchange rate stability in central and eastern Europe.
[15] As for both of these variables a certain degree of endogeneity can not be excluded in advance the lagged values of TRADE as well as FINANCE are introduced in the equation.
[16] Chinn and Wei (2008) introduce the economic size of the country measured by the PPP and the dollar measure of real GDP. However, in contrast to their work, this paper does not include the size of the economy. As the degree of trade openness TRADE is already part of the equation, the negative correlation between the two variables could result in a major multicollinearity problem.
[17] Levy-Yeyati and Sturzenegger (2003a) found that the exchange rate regime is relevant in an emerging market context, but not for industrial countries.

exchange rate regime may lead to a more buoyant credit growth driven by faster convergence to lower euro area interest rates or by the absence of major exchange rate risks.[18] Thus, access to foreign financial markets may be easier for such regimes, and, as a result, borrowing in foreign currencies and in total will increase. In turn, this may create major current account imbalances on the one hand, and on the other hand stabilise the financing of the current account deficits and permit imbalances to be more persistent than in regimes with a lower degree of real credit growth.

4. Empirical Results

The panel model is estimated using a FGLS estimator with fixed effects and panel-corrected standard errors. *Table 1* depicts the results of all three estimated models. The main conclusions are as follows.

First, the *basic model* reveals that a greater degree of exchange rate flexibility goes hand in hand with a significantly faster adjustment of the current account balance. Thus, the autoregressive coefficient depends on the exchange rate volatility and becomes (considering the interaction between the lag of the current account and the exchange rate volatility measure as an additional variable[19]) 0.65 – 0.06* (exchange rate volatility). Thus, a greater exchange rate volatility decreases the persistency of the current account balance. As a result, in a totally fixed exchange rate regime (the exchange rate volatility is equal to zero) the rate of reversion is at its lowest. It amounts to 0.35 (1 - 0.65), which is comparable to the result of Chinn and Wei (2008) who - in one approach - assign a rate of reversion of 0.26 to a fixed exchange rate regime.[20] The

[18] However, there might be an effect in the opposite direction, implying that fixed exchange rate regimes lead to a stronger discipline in monetary policy and, consequently, a lower credit growth. However, as the *real* credit growth is considered in the estimation, this effect should be only temporary in nature. In addition, the empirical evidence shows that fixed exchange rate regimes go hand in hand with a higher credit growth which also supports the assumption that this last effect might be of minor importance (see also footnote 24).

[19] In this context, only the interaction term between the current account balance and the exchange rate regime variable is relevant. As we refer to the adjustment process and not to the level of the current account balance, the exchange rate regime variable itself is not meaningful and should not be interpreted. The variable is basically included for technical econometric reasons.

[20] However, their results were not significant.

adjusted R^2 amounts to 0.6 and the F-test reveals that the variables are jointly significant.[21]

Table 1 Determinants of current account adjustment – FGLS estimation results

	(1) Basic Model	(2) Chinn/Wei Model	(3) Indirect Effects Model
CAGDP (-1)	0.650 (6.04)***	0.525 (1.76)*	0.535 (4.47)***
CAGDP (-1) * REGIME (-1)	-0.058 (-2.48)***	-0.094 (-3.23)***	-0.033 (-1.69)*
REGIME (-1)	0.275 (2.73)***	0.466 (4.09)***	0.157 (1.33)
CAGDP (-1) * TRADE(-1)		0.002 (0.86)	
CAGDP (-1) * FINANCE(-1)		0.013 (0.32)	
CAGDP (-1) * INFLATION		-0.011 (-2.04)**	
CAGDP (-1) * CREDIT			0.005 (2.55)***
CREDIT			-0.014 (-1.82)*
R2	0.6	0.7	0.7
N	143	143	143
Durbin-Watson Statistic	2.0	2.1	2.0

Notes: The control variables enter equation (2) not only in the interaction terms, but also in their levels. However, the levels are removed if they are revealed to be insignificant.

Standard errors in parenthesis.

*** significant 1% level, ** significant 5% level, * significant 10% level

[21] As the number of time periods T is relatively large compared to the number of countries N the resulting Nickell-Bias should not be a major problem in this estimations.

Based on the fact that the exchange rate volatility changes over time, the autoregressive coefficient has a time-varying component.[22] On average, it takes the value of -0.13, implying that the fixed part of the autoregressive coefficient (0.65) is reduced, to a significant, but not very pronounced degree. However, there is a strong variance over time, the figures ranging from - 0.3 to - 0.06 and tend to fall over time in absolute terms. Thus, the overall autoregressive coefficient (fixed and time-varying part) amounts, on average, to 0.52, with the lowest value being 0.35 and the highest value being 0.59. As a result, at the beginning of the observation period the persistency of the current account adjustment is comparatively low, however, tends to increase during the observation period when exchange rate regimes, on average, become more rigid.

Second, the *Chinn/Wei model* - which includes the interactions of several control variables with the lagged current account variable in line with Chinn and Wei (2008) - does not change the fundamental relationship between exchange rate volatility and current account adjustment. Increasing exchange rate volatility still goes hand in hand with a significantly higher rate of reversion of the current account balance. The degree of persistency decreases slightly as the impact of exchange rate volatility on the autoregressive coefficient rises to as much as - 0.09. However, except for INFLATION – where we find that a higher inflation rate increases the rate of reversion, which is in line with our predictions – the included control variables are not significant, which basically confirms the results of Chinn and Wei (2008). The adjusted R^2 increases only marginally compared to the basic model.

Third, the *indirect effects model* reveals that - as expected - a higher real credit growth rate increases the persistency ratio of the current account significantly by (0.005 * credit growth).[23] As a result, a more fixed exchange rate regime – which we assume tends to

[22] The time-varying component is defined as ρ_2 * Regime $_{t-1}$.

[23] It cannot be excluded that the exchange rate regime variable might be to some extent driven by the European integration process. However, as the real credit growth variable might be determined by the stipulated accession of the countries to the European Monetary Union to an even larger extent, the introduction of the real credit growth rate can act as a control variable to consider explicitly the impact of European integration process. As all countries in the sample are going to join EMU at a later stage in time, there is no option to control for the effect in a different way.

be associated with a more pronounced rate of real credit growth[24] – implies a statistically significant lower rate of reversion. The fundamental relationship between exchange rate volatility and current account adjustment remains basically unchanged, ie a more flexible exchange rate regime tends to significantly facilitate the current account reversion.[25]

However, after the introduction of the real credit growth the significance of the exchange rate regime is reduced. This is due to the fact that certain characteristics of the exchange rate regime - which in the former estimations are captured by the exchange rate volatility - are now controlled for by an additional variable.[26] Thus, it is straightforward to expect that the significance of the original variable goes down. As the impact of the exchange rate regime is still significant, however, the characteristics of the exchange rate regime seem to capture more than differences in real credit growth.

5. Robustness Checks

5.1. Instrumental Variable Approach

In a first step, we refer to an instrumental variable (IV) estimator according Anderson and Hsiao (1981). In contrast to the FGLS model, the dynamic IV estimation avoids the Nickell bias and takes into account a possible endogeneity of the right-hand side variables. The constant, the second lags of the endogenous variable, the exogenous variables and their lags as well as the two lags of the predetermined variables are used as instruments. *Table 2* depicts the results of all three estimated models.

The results of the *basic model* and of the *indirect effects model* are comparable to the FGLS estimation. However, with respect to the *Chinn/Wei model*, the advantages of the IV estimator are offset by lower efficiency relative to the FGLS estimation, which may

[24] This assumption seems to hold not only on a theoretical basis rather is also supported by the empirical evidence. A simple correlation analysis shows a correlation coefficient of – 0.7 supporting the stylized fact that a larger exchange rate volatility or a more flexible exchange rate regime tends to go hand in hand with a lower rate of real credit growth.
[25] The adjusted R^2 amounts to 0.7 – again, only a slight increase compared to the basic model.
[26] Furthermore, the limited amount of observations may play a role as well.

primarily reflect the limited amount of observations and relatively large number of variables. As the Nickell bias is unlikely to play a major role in our context (given the relatively small number of cross sections and the relatively large number of time periods) and as we already control for endogeneity issues by introducing the lagged variables, the FGLS estimation results may remain a reliable alternative.

Table 2 Determinants of current account adjustment – Results of the IV estimation

	(1) Basic Model	(2) Chinn/Wei Model	(3) Indirect Effects Model
CAGDP (-1)	0.880 (4.60)***	0.900 (1.87)*	0.604 (3.59)***
CAGDP (-1) * REGIME (-1)	-0,087 (-1.93)**	-0.136 (-1.27)	-0.065 (-1.98)**
REGIME (-1)	0.307 (1.25)	0.169 (0.38)	0.284 (1.50)
CAGDP (-1) * TRADE(-1)		-0.001 (-0.25)	
CAGDP (-1) * FINANCE(-1)		0.078 (1.23)	
CAGDP (-1) * INFLATION		-0.004 (-0.18)	
CAGDP (-1) * CREDIT			0.008 (3.66)***
CREDIT			-0.005 (-0.62)
R2	0.5	0.6	0.6
N	143	143	143
Durbin-Watson Stat.	2.1	1.8	2.1

Notes: The control variables enter equation (2) not only in the interaction terms, but also in their levels. However, the levels are removed if they are revealed to be insignificant.

Standard errors in parenthesis.

*** significant 1% level, ** significant 5% level, * significant 10% level

5.2. Exchange Rate Regime Classification Approach

In order to compare the results more directly to the empirical work carried out by Chinn and Wei (2008), we run the estimations with a dummy variable based on the Reinhart and Rogoff exchange rate regime classification scheme.[27] We consider the index in two different ways. *First*, we refer to the original Reinhart and Rogoff index (RR 14) which ranges from 1 to 14, moving from less to more exchange rate flexibility.[28] *Second*, we stick more closely to Chinn and Wei (2008) who aggregated the series of Reinhart and Rogoff into three categories, namely fixed, intermediate and floating exchange rate regimes. These categories are reversed; as a result, the index (RR 3) ranges from low values (high flexibility) to high values (high fixity).[29]

The results of the *basic model* confirm the significance of the autoregressive term (coefficient: 0.5, significant 10% level), however, show no significant relationship between the exchange rate regime (RR 3) and the speed of current account adjustment. However, this is not at all surprising as the RR 3 index shows very little variation in the data and small changes in the exchange rate regime are not really captured in the dummy variable. By contrast, in the case of the RR 14 index the results showed that a more flexible exchange rate regime decreases the persistency of the current account by 0.04 (significant 10% level), which is comparable to our earlier results.

Altogether, the results indicate that *first*, the RR 14 seems to be more adequate than the RR 3 which is used by Chinn and Wei (2008) to measure the exchange rate regime, *second*, as the RR 14 indicator allows us to confirm our earlier findings, the chosen sample may not be decisive for the outcome, and *third*, the different methodologies used to classify the exchange rate regime may, to a considerable extent, account for the fact that our results are different compared with the outcome of Chinn and Wei (2008).

[27] For a detailed analysis of exchange rate regime classifications see e.g. Tavlas, Dellas and Stockman (2008).
[28] See Reinhart and Rogoff (2004).
[29] The first is floating (managed floating to freely falling), the second is intermediate (from pre announced crawling peg to moving band that is narrower than or equal to +/- 2%); the third is fixed (from no legal tender to de facto peg).

5.3. Vector Error Correction Model

The estimations in *Section 4* neglect major determinants of long-term current account equilibrium positions. As in an emerging market environment imbalances may persist for quite some time during the catching-up process, the structural current account positions are an appropriate benchmark for current account balances to converge to. By referring to a vector error correction (VEC) model we are able to differentiate explicitly between a long-term structural equation and the short-term adjustment process.

The *long-term relationship* is based on a reduced form approach which considers major determinants of current account positions in an emerging market context[30]:

$$CAGDP_{it} = \rho_0 + \rho_1 RELGDP_{it} + \rho_2 FISCAL_{it} + \rho_3 INVEST_{it} + \rho_4 REER_{it} + \varepsilon_{it} \quad (3)$$

where CAGDP is the current account as a percentage of GDP, RELGDP the relative real per capita income of the emerging market economy compared with the average income of the EU 15 countries (log.), FISCAL the fiscal balance in relation to GDP, INVEST the investment ratio, REER the real effective exchange rate (log.), and ε_{it} the error term.

The *short-term adjustment process* is assumed to have the following form:

$$\Delta CAGDP_{it} = \rho_0 + \rho_1 \Delta CAGDP_{it-1} + \rho_2 RES_{it-1} + \rho_3 RES_{it-1} * REGIME_{it-1} + \rho_4 REGIME_{it-1} + \varepsilon_{it} \quad (4)$$

where Δ CAGDP is the current account difference as a percentage of GDP, RES the residuals of the long-term relationship in equation (3), with ρ_2 the vector error correction term, followed by RES * REGIME as the interaction term between the residuals and the exchange rate regime based on an exchange rate volatility measure, and ε_{it} the error term.

The *VEC* estimation results (*see Table 3*) confirm the outcome of the FGLS model. Again, the adjustment process of the current account balance depends on the exchange rate volatility or, more precisely, a greater degree of exchange rate flexibility

significantly boosts the adjustment of the current account balance to the long-term structural equilibrium. After having considered the interaction between the residuals of the long-term estimation and the exchange rate volatility measure as an additional variable, the vector error correction term becomes - 0.44 - 0.11 * (exchange rate volatility).[31] Thus, greater exchange rate volatility increases the negative vector error correction term and significantly enhances the current account rate of reversion.

Table 3 Determinants of current account adjustment – Results of the VEC estimation

	Vec Model
RES (-1)	-0.443 (2.08)**
RES (-1) * REGIME (-1)	-0,115 (-2.52)***
REGIME (-1)	1.114 (2.65)***
D (CAGDP (-1))	1.128 (0.95)
R2	0.4
N	143
Durbin-Watson Stat.	2.1

Standard errors in parenthesis.

*** significant 1% level, ** significant 5% level, * significant 10% level

[30] See Herrmann and Jochem (2005) for further details as well as Ca`Zorzi et al. (2009) for the inherent problems of the structural current account balances approach.
[31] These coefficients are significant at the 5% level.

6. Conclusion

Based on a dataset of 11 countries in central, eastern and south-eastern Europe from 1994 to 2007, the empirical investigation confirms that there is a significant relationship between the exchange rate regime and the adjustment of the current account balance. We conclude that, by rendering the exchange rate regime more flexible, policy makers may – at least in the short run – expect the pace of the current account adjustment process to be increased or the rate of reversion to the equilibrium to be enhanced.

These results hold true if we apply control variables such as the degree of trade and financial openness as well as the inflation rate in line with Chinn and Wei (2008). Checking for the indirect impact of the exchange rate regime via the real credit growth rate also indicates that a more flexible exchange rate regime causes current account balances to adjust at a more rapid pace. These conclusions continue to hold true if we consider endogeneity issues in a more specific way by referring to a dynamic instrumental variable framework. Finally, a vector error correction model confirms that the adjustment process for the current account balance still depends on the exchange rate volatility even if we differentiate explicitly between a long-run structural equation and the short-run adjustment process.

Our results are in contrast to those of Chinn and Wei (2008) who examine the connection between the two variables for 170 countries between 1971 and 2005 based on two familiar de facto exchange rate classification schemes. In line with their work, we estimate a dummy variable approach referring to the Reinhart and Rogoff de facto exchange rate regime index. By comparing the two studies, we assume that the way the exchange rate regime is measured has an important bearing on the outcome.

References

Arratibel, O. et al. 2008. Real Convergence in Central and Eastern European EU Member States - which Role for Exchange Rate Volatility. ECB Working Paper Series 929, European Central Bank, Frankfurt.

Bakker, B. 2008. Current Account Deficits in Eastern Europe – Do Exchange Rate Regimes Matter? IMF Policy Discussion Paper (forthcoming), International Monetary Fund, Washington.

Bernanke, B.S. 2005. The Global Saving Glut and the US Current Account Deficit. Speech Given on March 10, 2005, at the Sandridge Lecture, Virginia Association of Economists, Richmond, Virginia.

Blanchard, O. 2007. Current Account Deficits in Rich Countries. Mundell-Fleming Lecture. IMF Staff Papers, International Monetary Fund, Washington.

Blanchard, O. and F. Giavazzi 2002. Current Account Deficits in the Euro Area: The End of the Feldstein-Horioka Puzzle? Brooking Papers on Economic Activity 2, 147-210.

Ca` Zorzi, M., Chudik, A. and A. Dieppe 2009. Current Account Benchmarks for Central and Eastern Europe - A Desperate Search? Working Paper Series 995. European Central Bank, Frankfurt am Main.

Chinn, M.D. and H. Ito 2008. A new Measure of Financial Openness. J*ournal of Comparative Policy Analysis* 10 (3), 309-322.

Chinn, M.D. and S.-J. Wei 2008. A Faith-based Initiative: Do we really know that a Flexible Exchange Rate Regime Facilitates Current Account Adjustment? Working Paper 14420. National Bureau of Economic Research, Cambridge, MA.

Clarida, R. H. 2005. Japan, China, and the US Current Account Deficit, The Cato Journal, No. 25, 111-114.

Clarida, R. H., Goretti, M. and M.P. Taylor 2007. Are There Thresholds of Current Account Adjustment in the G 7? Working Paper Series 12193. National Bureau of Economic Research, Cambridge, MA.

Clarida, R. H. 2007. G 7 Current Account Imbalances: Sustainability amd Adjustment, Working Paper Series 12194. National Bureau of Economic Research, Cambridge, MA.

Decressin, J. and E. Stavrev 2009. Current Accounts in a Currency Union. Working Paper 09/127, International Monetary Fund, Washington.

De Grauwe, P. and G. Schnabl 2004. Exchange Rate Regimes and Macroeconomic Stability in Central and Eastern Europe. CESifo Working Paper 1182. CESifo, Munich.

Devereux, M.B. and H. Genberg 2006. Currency Appreciation and Current Account Adjustment. HKIMR Working Paper 17. Hong Kong Institute for Monetary Research, Hong Kong.

Dooley, M.P., Folkerts-Landau, D. and P.M. Garber 2003. An Essay on the Revived Bretton Woods System, Working Paper Series 9971. National Bureau of Economic Research, Cambridge, MA.

Dooley, M.P., Folkerts-Landau, D. and P.M. Garber 2004. The US Current Account Deficit and Economic Development: Collateral for a Total Return Swap, Working Paper Series 10727. National Bureau of Economic Research, Cambridge, MA.

Fagan, G. and V. Gaspar 2007. Adjusting to the Euro. Working Paper Series 716. European Central Bank, Frankfurt am Main.

Freund, C. 2000. Current Account Adjustment in Industrialized Countries. International Finance Discussion Papers 692. Board of Governors of the Federal Reserve System. Washington.

Friedman, M. 1953. The Case for Flexible Exchange Rates. Essays in Positive Economics. University of Chicago Press, Chicago. 157-203.

Gosh, A., Gulde, A.M. and H. Wolf 2003. Exchange Rate Regimes: Choices and Consequences. Cambridge, Massachusetts, MIT Press.

Gosh, A., Terrones, M. and J. Zettelmeyer 2009. Exchange Rate Regimes and External Adjustment: New Answers to an Old Debate? Unpublished manuscript.

Gourinchas, P.O. and H. Rey 2007. International Financial Adjustment. *Journal of Political Economy* 115(4), 665-703.

Herrmann, S. and A. Jochem 2005. Determinants of Current Account Developments in the central and eastern European EU Member States – Consequences for the Enlargement of the Euro Area. Working Paper Series 32. Deutsche Bundesbank, Frankfurt am Main.

Herrmann, S. and A. Winkler 2008. Real Convergence, Financial Markets, and the Current Account - Emerging Europe versus Emerging Asia. Occasional Paper Series 88. European Central Bank, Frankfurt am Main.

Ho, C. and R. McCauley 2003. Living with Flexible Exchange Rates: Issues and Recent Experience in Inflation Targeting Emerging Market Economies, Working Paper Series 130. Bank for International Settlements, Basel.

Ju, J. and S.-J. Wei 2003. Current Account Adjustment, Working Paper Series 13388. National Bureau of Economic Research, Cambridge, MA.

Kray, A. and J. Ventura 2000. Current Accounts in Debtor and Creditor Countries. *Quarterly Journal of Economics*, November, 1137-1166.

Lane, P. 2008. EMU and Financial Integration. Paper prepared for the 5th Central Banking Conference on the Euro at Ten: Lessons and Challenges, November 13-14.

Levy-Yeyati, E. and F. Sturzenegger 2003a. To Float or to Fix: Evidence on the Impact of Exchange Rate Regimes on Growth. *American Economic Review* 93 (4).

Levy-Yeyati, E. and F. Sturzenegger 2003b. A de facto Classification of Exchange Rate Regimes: A Methodological Note. *American Economic Review*, web edition.

Milesi-Ferretti, G.M. and A. Razin 1998. Current Account Reversals and Currency Crisis, Working Paper Series 6620. National Bureau of Economic Research, Cambridge, MA.

Mussa, M. 1986. Nominal Exchange Rate Regimes and the Behaviour of the Real Exchange Rates: Evidence and Implications, Carnegie-Rochester Conference Series on Public Policy, Vol. 25, 117-214.

Rahman, J. 2008). Current Account Developments in new Member States of the European Union: Equilibrium, Excess, and EU-Phoria. Working Paper 92. International Monetary Fund, Washington.

Reinhart, C.M. and K. Rogoff 2004. The Modern History of Exchange Rate Arrangements: A Reinterpretation. *Quarterly Journal of Economics* 119 (1), 1-48.

Sachs, J. 1982. The Current Account in the Macroeconomic Adjustment Process. *Scandinavian Journal of Economics* 84, 147-159.

Tavlas, G., Dellas, H. and Stockman, A. C. 2008). The Classification and Performance of Alternative Exchange Rate Systems. *European Economic Review* 52, 941-963.

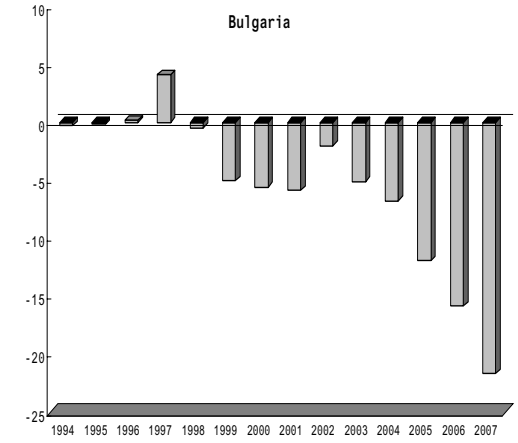
Data Annex

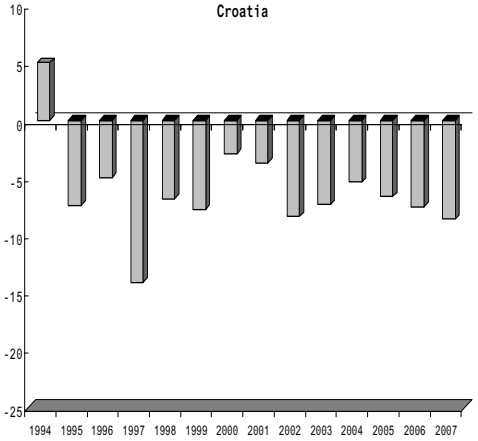
Please find below a listing of mnemonics, sources and descriptions for all the variables included in the empirical investigation.

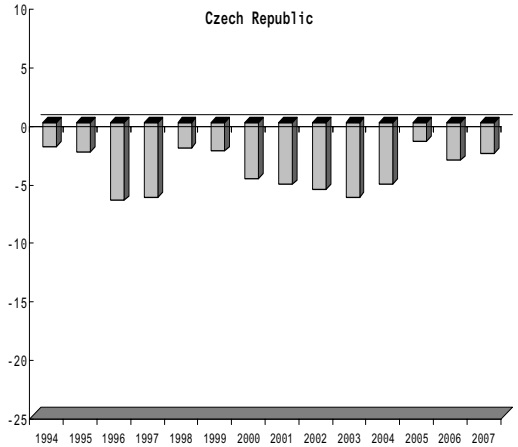
Mnemonic	**Source***	V**ariable description**
CAGDP	WDI	Current account to GDP ratio (in percent)
REGIME	ECB	Exchange rate volatility measure based on the z-score index proposed by Gosh, Gulde and Wolf (2003) referring to the nominal effective exchange rate versus 44 trading partners
TRADE	WDI	Trade openness indicator: sum of imports and exports to GDP ratio
FINANCE	CHINN	Financial openness indicator: Chinn-Ito index of financial liberalisation (KAOPEN)
INFLATION	WDI	Inflation rate, consumer prices, annual
CREDIT	EBRD	Real credit growth rate
RR 14	IRR	Original Reinhart/Rogoff dummy variable for de facto exchange rate regime classification
RR 3	IRR	Aggregated Reinhart/Rogoff dummy variable for de facto exchange rate regime classification (revised by Chinn and Wei, 2008)
RELGDP	EUROSTAT	Real per capita income relative to the EU 15 average, in logarithms
FISCAL	AMECO	Fiscal deficit, net lending /borrowing of general government (ESA 95) as a percentage of GDP at current prices
INVEST	AMECO	Investment ratio, gross capital formation, as a percentage of GDP at current prices
REER	AMECO	Real effective exchange rates, performance relative to 35 industrial countries, 2000=100, in logarithms

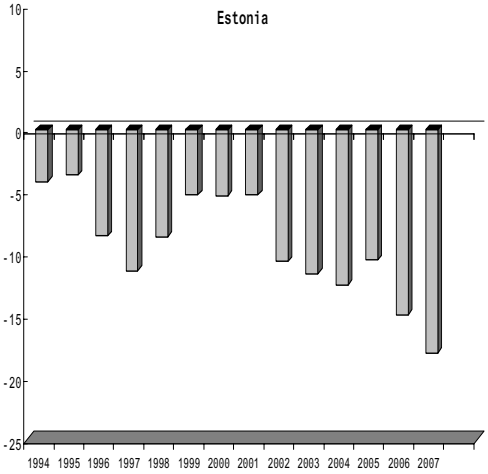
* WDI: World Bank World Development Indicator (2008); ECB: Data Warehouse European Central Bank; CHINN: Chinn/Ito (2008) or http://web.pdx.edu/ito, KAOPEN is the first principal component of four indices, in order to simplify interpretation, this variable is adjusted such that the minimum value is zero, ie it ranges from zero to a positive value; EBRD: EBRD Transition Report 2008; IRR: Dataset for Ilzetzki, Reinhart and Rogoff (2008), annual data, fine classification. See Background material for "Exchange Rate Arrangements Entering the 21st Century: Which Anchor Will Hold?" on http://terpconnect.umd.edu/~creinhar/Papers.html.

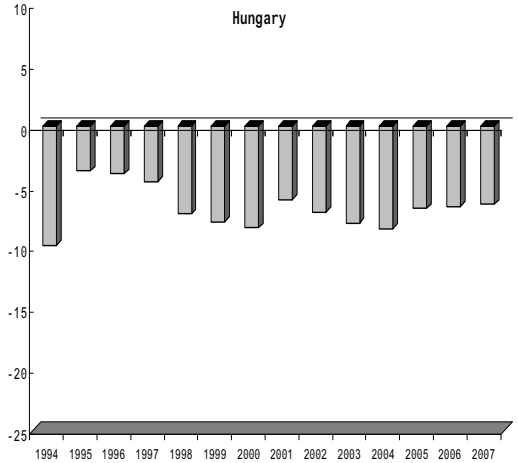
Annex 1: Current Account Balances (in % of GDP), 1994-2007

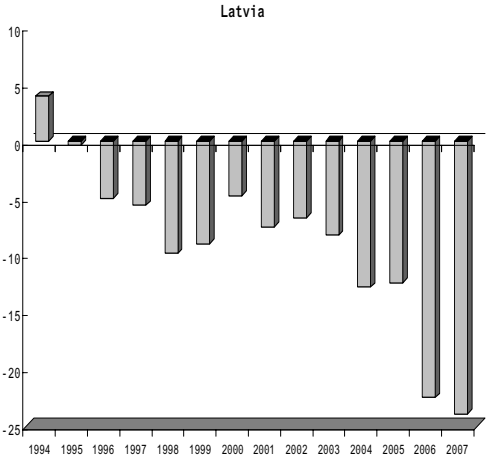


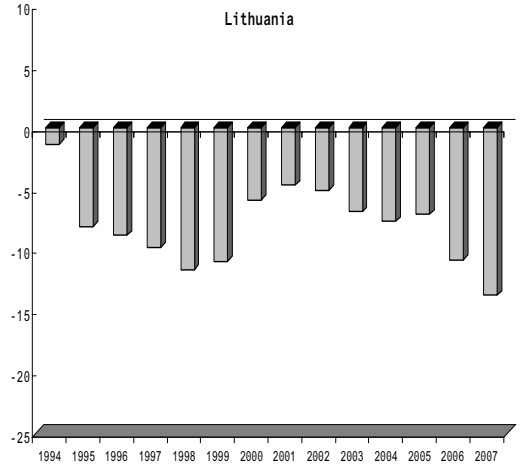


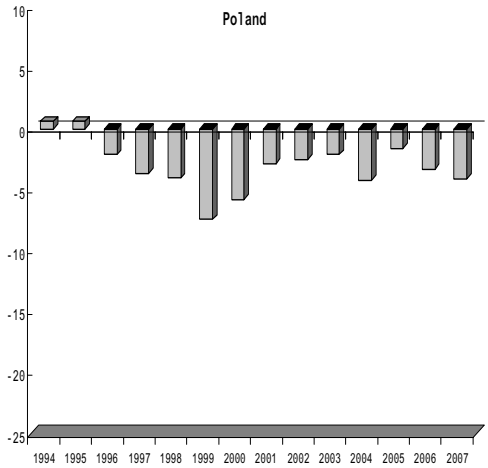


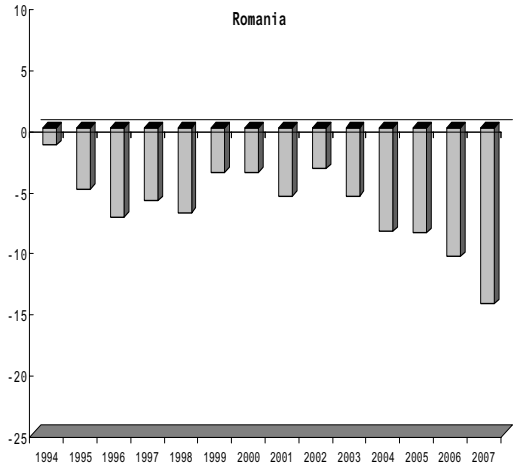


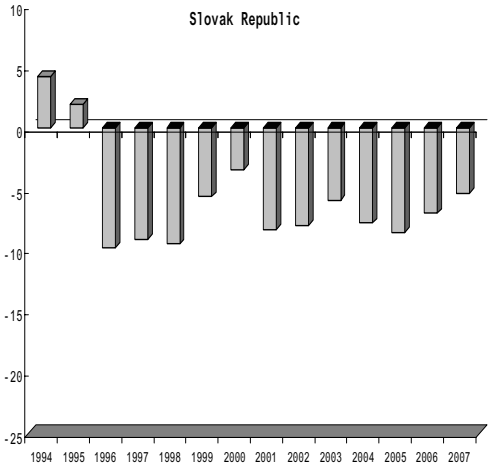


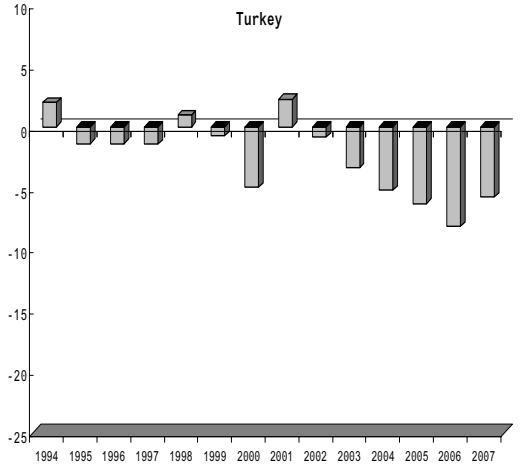



Lithuania
10
5
0
-5
-10
-15
-20
-25
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

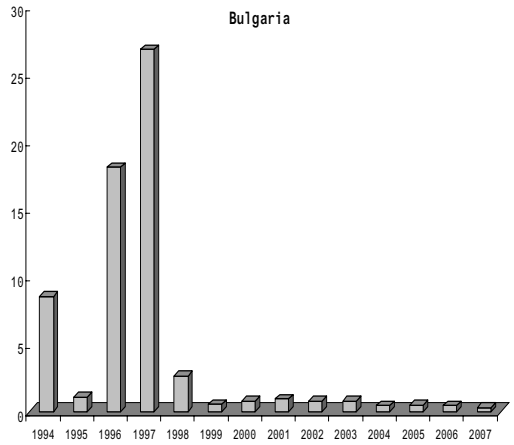

Poland
10
5
0
-5
-10
-15
-20
-25
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

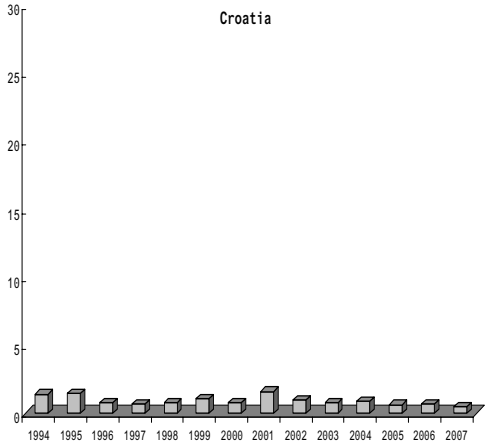

Romania
10
5
0
-5
-10
-15
-20
-25
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

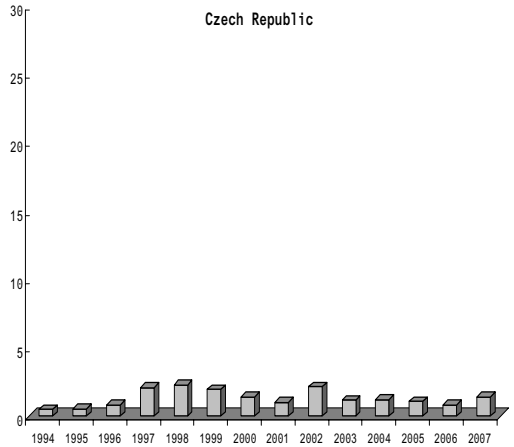

Slovak Republic
10
5
0
-5
-10
-15
-20
-25
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

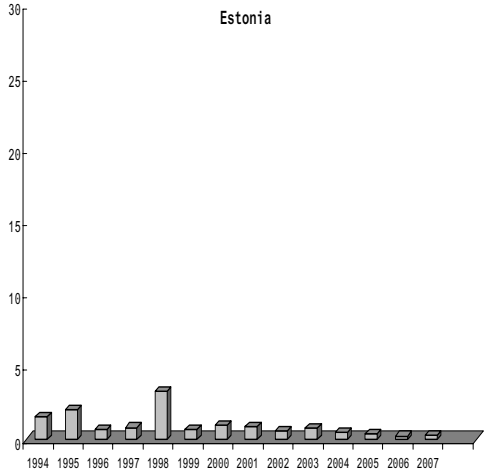

Turkey
10
5
0
-5
-10
-15
-20
-25
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

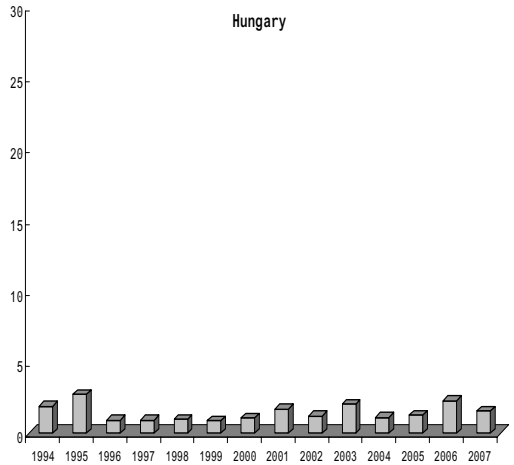
Annex 2: Exchange Rate Volatility (z-score index), 1994-2007

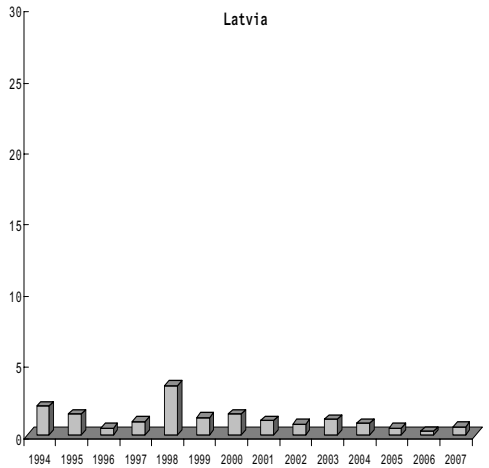


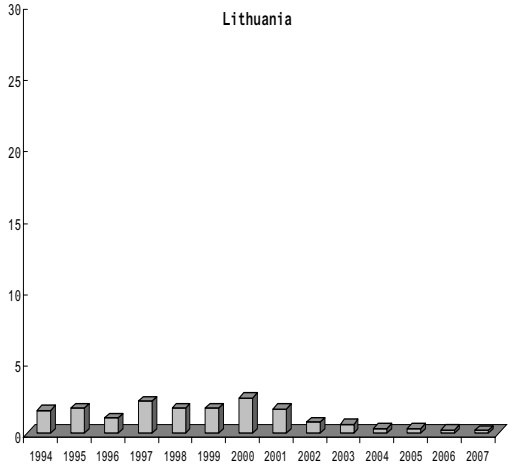


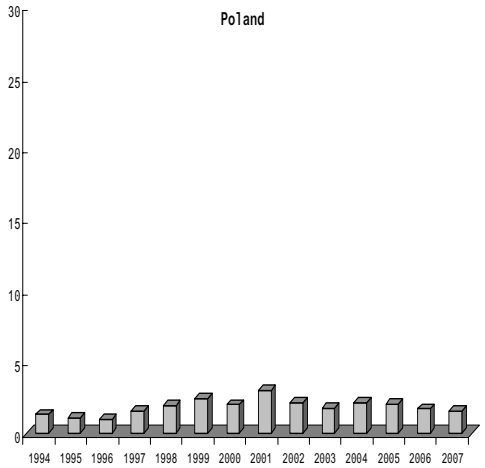


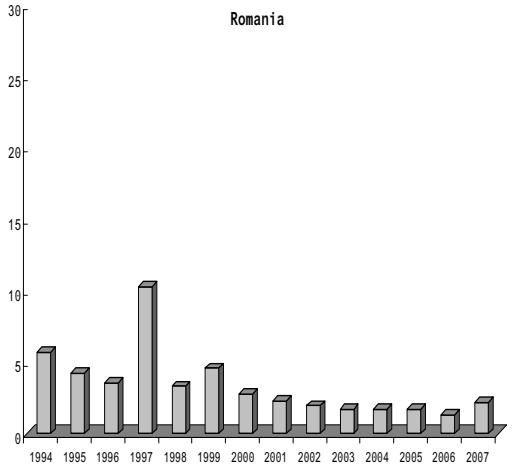


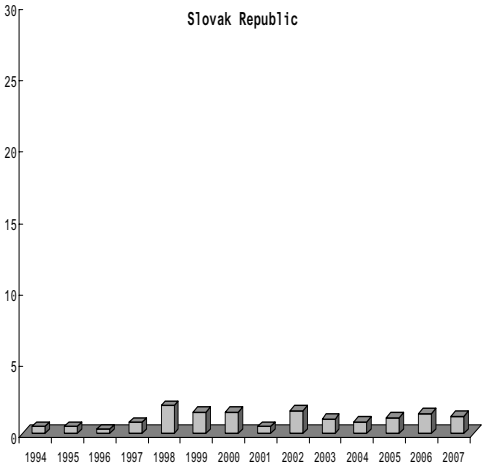


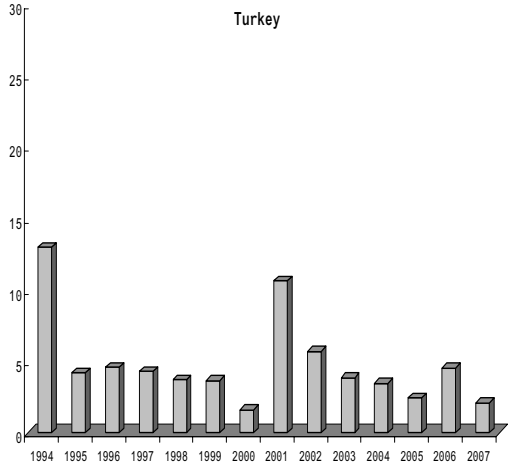



Lithuania
30
25
20
15
10
5
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007


Poland
30
25
20
15
10
5
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007


Romania
30
25
20
15
10
5
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007


Slovak Republic
30
25
20
15
10
5
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007


Turkey
30
25
20
15
10
5
0
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

The following Discussion Papers have been published since 2008:

Series 1: Economic Studies

01	2008	Can capacity constraints explain asymmetries of the business cycle?	Malte Knüppel
02	2008	Communication, decision-making and the optimal degree of transparency of monetary policy committees	Anke Weber
03	2008	The impact of thin-capitalization rules on multinationals' financing and investment decisions	Buettner, Overesch Schreiber, Wamser
04	2008	Comparing the DSGE model with the factor model: an out-of-sample forecasting experiment	Mu-Chun Wang
05	2008	Financial markets and the current account – emerging Europe versus emerging Asia	Sabine Herrmann Adalbert Winkler
06	2008	The German sub-national government bond market: evolution, yields and liquidity	Alexander Schulz Guntram B. Wolff
07	2008	Integration of financial markets and national price levels: the role of exchange rate volatility	Mathias Hoffmann Peter Tillmann
08	2008	Business cycle evidence on firm entry	Vivien Lewis
09	2008	Panel estimation of state dependent adjustment when the target is unobserved	Ulf von Kalckreuth
10	2008	Nonlinear oil price dynamics – a tale of heterogeneous speculators?	Stefan Reitz Ulf Slopek
11	2008	Financing constraints, firm level adjustment of capital and aggregate implications	Ulf von Kalckreuth

12	2008	Sovereign bond market integration: the euro, trading platforms and globalization	Alexander Schulz Guntram B. Wolff
13	2008	Great moderation at the firm level? Unconditional versus conditional output volatility	Claudia M. Buch Jörg Döpke Kerstin Stahn
14	2008	How informative are macroeconomic risk forecasts? An examination of the Bank of England's inflation forecasts	Malte Knüppel Guido Schultefrankenfeld
15	2008	Foreign (in)direct investment and corporate taxation	Georg Wamser
16	2008	The global dimension of inflation – evidence from factor-augmented Phillips curves	Sandra Eickmeier Katharina Moll
17	2008	Global business cycles: convergence or decoupling?	M. Ayhan Kose Christopher Otrok, Ewar Prasad
18	2008	Restrictive immigration policy in Germany: pains and gains foregone?	Gabriel Felbermayr Wido Geis Wilhelm Kohler
19	2008	International portfolios, capital accumulation and foreign assets dynamics	Nicolas Coeurdacier Robert Kollmann Philippe Martin
20	2008	Financial globalization and monetary policy	Michael B. Devereux Alan Sutherland
21	2008	Banking globalization, monetary transmission and the lending channel	Nicola Cetorelli Linda S. Goldberg
22	2008	Financial exchange rates and international currency exposures	Philip R. Lane Jay C. Shambaugh

23	2008	Financial integration, specialization and systemic risk	F. Fecht, H. P. Grüner P. Hartmann
24	2008	Sectoral differences in wage freezes and wage cuts: evidence from a new firm survey	Daniel Radowski Holger Bonin
25	2008	Liquidity and the dynamic pattern of price adjustment: a global view	Ansgar Belke Walter Orth, Ralph Setzer
26	2008	Employment protection and temporary work agencies	Florian Baumann Mario Mechtel, Nikolai Stähler
27	2008	International financial markets' influence on the welfare performance of alternative exchange rate regimes	Mathias Hoffmann
28	2008	Does regional redistribution spur growth?	M. Koetter, M. Wedow
29	2008	International financial competitiveness and incentives to foreign direct investment	Axel Jochem
30	2008	The price of liquidity: bank characteristics and market conditions	Falko Fecht Kjell G. Nyborg, Jörg Rocholl
01	2009	Spillover effects of minimum wages in a two-sector search model	Christoph Moser Nikolai Stähler
02	2009	Who is afraid of political risk? Multinational firms and their choice of capital structure	Iris Kesternich Monika Schnitzer
03	2009	Pooling versus model selection for nowcasting with many predictors: an application to German GDP	Vladimir Kuzin Massimiliano Marcellino Christian Schumacher

04	2009	Fiscal sustainability and policy implications for the euro area	Balassone, Cunha, Langenus Manzke, Pavot, Prammer Tommasino
05	2009	Testing for structural breaks in dynamic factor models	Jörg Breitung Sandra Eickmeier
06	2009	Price convergence in the EMU? Evidence from micro data	Christoph Fischer
07	2009	MIDAS versus mixed-frequency VAR: nowcasting GDP in the euro area	V. Kuzin, M. Marcellino C. Schumacher
08	2009	Time-dependent pricing and New Keynesian Phillips curve	Fang Yao
09	2009	Knowledge sourcing: legitimacy deficits for MNC subsidiaries?	Tobias Schmidt Wolfgang Sofka
10	2009	Factor forecasting using international targeted predictors: the case of German GDP	Christian Schumacher
11	2009	Forecasting national activity using lots of international predictors: an application to New Zealand	Sandra Eickmeier Tim Ng
12	2009	Opting out of the great inflation: German monetary policy after the breakdown of Bretton Woods	Andreas Beyer, Vitor Gaspar Christina Gerberding Otmar Issing
13	2009	Financial intermediation and the role of price discrimination in a two-tier market	Stefan Reitz Markus A. Schmidt, Mark P. Taylor
14	2009	Changes in import pricing behaviour: the case of Germany	Kerstin Stahn

15	2009	Firm-specific productivity risk over the business cycle: facts and aggregate implications	Ruediger Bachmann Christian Bayer
16	2009	The effects of knowledge management on innovative success – an empirical analysis of German firms	Uwe Cantner Kristin Joel Tobias Schmidt
17	2009	The cross-section of firms over the business cycle: new facts and a DSGE exploration	Ruediger Bachmann Christian Bayer
18	2009	Money and monetary policy transmission in the euro area: evidence from FAVAR- and VAR approaches	Barno Blaes
19	2009	Does lowering dividend tax rates increase dividends repatriated? Evidence of intra-firm cross-border dividend repatriation policies by German multinational enterprises	Christian Bellak Markus Leibrecht Michael Wild
20	2009	Export-supporting FDI	Sebastian Krautheim
21	2009	Transmission of nominal exchange rate changes to export prices and trade flows and implications for exchange rate policy	Mathias Hoffmann Oliver Holtemöller
22	2009	Do we really know that flexible exchange rates facilitate current account adjustment? Some new empirical evidence for CEE countries	Sabine Herrmann

Series 2: Banking and Financial Studies

01	2008	Analyzing the interest rate risk of banks using time series of accounting-based data: evidence from Germany	O. Entrop, C. Memmel M. Wilkens, A. Zeisler
02	2008	Bank mergers and the dynamics of deposit interest rates	Ben R. Craig Valeriya Dinger
03	2008	Monetary policy and bank distress: an integrated micro-macro approach	F. de Graeve T. Kick, M. Koetter
04	2008	Estimating asset correlations from stock prices or default rates – which method is superior?	K. Düllmann J. Küll, M. Kunisch
05	2008	Rollover risk in commercial paper markets and firms' debt maturity choice	Felix Thierfelder
06	2008	The success of bank mergers revisited – an assessment based on a matching strategy	Andreas Behr Frank Heid
07	2008	Which interest rate scenario is the worst one for a bank? Evidence from a tracking bank approach for German savings and cooperative banks	Christoph Memmel
08	2008	Market conditions, default risk and credit spreads	Dragon Yongjun Tang Hong Yan
09	2008	The pricing of correlated default risk: evidence from the credit derivatives market	Nikola Tarashev Haibin Zhu
10	2008	Determinants of European banks' engagement in loan securitization	Christina E. Bannier Dennis N. Hänsel
11	2008	Interaction of market and credit risk: an analysis of inter-risk correlation and risk aggregation	Klaus Böcker Martin Hillebrand

12	2008	A value at risk analysis of credit default swaps	B. Raunig, M. Scheicher
13	2008	Systemic bank risk in Brazil: an assessment of correlated market, credit, sovereign and inter-bank risk in an environment with stochastic volatilities and correlations	Theodore M. Barnhill, Jr. Marcos Rietti Souto
14	2008	Regulatory capital for market and credit risk interaction: is current regulation always conservative?	T. Breuer, M. Jandačka K. Rheinberger, M. Summer
15	2008	The implications of latent technology regimes for competition and efficiency in banking	Michael Koetter Tigran Poghosyan
16	2008	The impact of downward rating momentum on credit portfolio risk	André Güttler Peter Raupach
17	2008	Stress testing of real credit portfolios	F. Mager, C. Schmieder
18	2008	Real estate markets and bank distress	M. Koetter, T. Poghosyan
19	2008	Stochastic frontier analysis by means of maximum likelihood and the method of moments	Andreas Behr Sebastian Tente
20	2008	Sturm und Drang in money market funds: when money market funds cease to be narrow	Stehpan Jank Michael Wedow
01	2009	Dominating estimators for the global minimum variance portfolio	Gabriel Frahm Christoph Memmel
02	2009	Stress testing German banks in a downturn in the automobile industry	Klaus Düllmann Martin Erdelmeier
03	2009	The effects of privatization and consolidation on bank productivity: comparative evidence from Italy and Germany	E. Fiorentino A. De Vincenzo, F. Heid A. Karmann, M. Koetter

04	2009	Shocks at large banks and banking sector distress: the Banking Granular Residual	Sven Blank, Claudia M. Buch Katja Neugebauer
05	2009	Why do savings banks transform sight deposits into illiquid assets less intensively than the regulation allows?	Dorothee Holl Andrea Schertler
06	2009	Does banks' size distort market prices? Evidence for too-big-to-fail in the CDS market	Manja Völz Michael Wedow
07	2009	Time dynamic and hierarchical dependence modelling of an aggregated portfolio of trading books – a multivariate nonparametric approach	Sandra Gaisser Christoph Memmel Rafael Schmidt Carsten Wehn
08	2009	Financial markets' appetite for risk – and the challenge of assessing its evolution by risk appetite indicators	Birgit Uhlenbrock
09	2009	Income diversification in the German banking industry	Ramona Busch Thomas Kick

Visiting researcher at the Deutsche Bundesbank

The Deutsche Bundesbank in Frankfurt is looking for a visiting researcher. Among others under certain conditions visiting researchers have access to a wide range of data in the Bundesbank. They include micro data on firms and banks not available in the public. Visitors should prepare a research project during their stay at the Bundesbank. Candidates must hold a PhD and be engaged in the field of either macroeconomics and monetary economics, financial markets or international economics. Proposed research projects should be from these fields. The visiting term will be from 3 to 6 months. Salary is commensurate with experience.

Applicants are requested to send a CV, copies of recent papers, letters of reference and a proposal for a research project to:

Deutsche Bundesbank
Personalabteilung
Wilhelm-Epstein-Str. 14

60431 Frankfurt
GERMANY