

Kutan, Ali M.; Yigit, Taner M.

Working Paper

Nominal and real stochastic convergence within transition economies and to the European Union: Evidence from panel data

ZEI Working Paper, No. B 21-2002

Provided in Cooperation with:

ZEI - Center for European Integration Studies, University of Bonn

Suggested Citation: Kutan, Ali M.; Yigit, Taner M. (2002) : Nominal and real stochastic convergence within transition economies and to the European Union: Evidence from panel data, ZEI Working Paper, No. B 21-2002, Rheinische Friedrich-Wilhelms-Universität Bonn, Zentrum für Europäische Integrationsforschung (ZEI), Bonn

This Version is available at:

<https://hdl.handle.net/10419/39599>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn



Ali M. Kutan, Taner M. Yigit

**Nominal and Real Stochastic
Convergence Within the
Transition Economies and to
the European Union:
Evidence from Panel Data**

Working Paper

**B 21
2002**

**Nominal and Real Stochastic Convergence
Within the Transition Economies
and to the European Union:
Evidence From Panel Data**

By

Ali M. Kutan* and Taner M. Yigit**

* Kutan- Economics and Finance Department, School of Business, Southern Illinois University Edwardsville, IL 62026-1102 and Center for European Integration Studies (ZEI), Bonn, Germany. E-mail: akutan@siue.edu

** Yigit- Economics Department, John Cook School of Business, St. Louis University, 3674 Lindell Blvd., St. Louis, MO 63108.

We would like to thank Josef Brada, Karel Janda, Muhammad Islam, Evžen Koèenda, Elmar Koch, Jack Strauss, and Petr Zemcik for their useful comments and suggestions on earlier versions of this paper. The usual disclaimer applies.

ABSTRACT

This paper investigates the issue of real and nominal economic convergence of transition economies in two distinct ways: i) within their own groups as in Koèenda (2001) and ii) to the European Union (EU). We extend Koèenda's study not only by using a more stable period (post-93) but also by employing a more recent panel estimation approach developed by Im, Pesaran, and Shin (IPS) (1997), which offers less restrictive assumptions about convergence by allowing heterogeneity in the convergence rates than previous panel unit root techniques. Relaxing the assumption of homogeneity in convergence rates yields less convergence in price level and money supply variables than reported by Koèenda. Again using the IPS method, we extend the investigation to examine the convergence of the first and second round candidate economies to EU standards. We find that the first-round candidates have made significant progress in monetary policy convergence with respect to EU and there is significant real convergence between the first round candidate economies and EU, but not for the second round candidate countries. The results have important implications for full EU membership preparations by these countries, including the choice of an optimal interim exchange rate policy.

I. Introduction

Since the early 1990s, the transition economies of Central and East Europe, the Baltic States, and of the former Soviet Union have introduced a series of fundamental economic reforms, allowing market forces to play a significant role in the decision-making process of economic agents. Although monetary and exchange rate policies implemented varied significantly across countries (Desai, 1998 and Kutan and Brada, 2000), there has been significant progress in reducing the initial inflationary pressures due to monetary overhang. More recently, the countries have begun experiencing positive real economic growth.

With countries displaying similar economic performance over time, we expect real and monetary convergence in macroeconomic fundamentals as the impact of initial conditions decline over time (Backé et al., 2002). Three reasons motivate us to investigate the degree of such convergence in transition economies. First, evidence of no economic convergence within a region can bring about social and political instability as economic performance varies significantly across countries. Second, the majority of the Central and Eastern European transition countries are also the first and second-round candidates for the European Union (EU). Finally, the majority of the countries have signed Association agreements with the EU. Evidence of non-convergence would imply that such institutional linkages with respect to the EU do not necessarily lead to macroeconomic convergence.

Until very recently, emphasis in the literature has focused on the convergence of transition economies to EU standards, and convergence within groups has been neglected. In this paper, we study both issues. Brada and Kutan (2001) examined monetary policy convergence between the candidate economies and EU, proxied by

Germany, and found no convergence between base money in Germany and the transition-economy candidates for EU membership. In contrast, the market-economy candidates, Cyprus, Malta and Turkey, showed significant convergence with German money base. Korhonen and Fidrmuc (2001) tested whether the candidate countries display significant correlation of their supply and demand shocks with selected EU economies over 1991-2000. They reported that, except Estonia and Hungary, the candidate economies display low correlation. Richards and Tersman (1996) examined the issue of price-level convergence between the EU and the transition-economy candidates and reported large gaps in that the latter countries have much lower price levels than do existing EU members. Finally, Estrin et al. (2001) tested whether there has been convergence between the ex-communist block and the West, both pre-and post-reform, using per capita output data during the 1970-98 period. They found little evidence of convergence to the West, either during the pre-reform (1970-90) period or the full period (1970-98). Backé et al. (2002) found significant differences in comparative price levels between EU countries and most Central and Eastern European EU accession countries.

The only notable exception to the literature is a recent study by Koèenda (2001). He studied the nominal and real convergence of macroeconomic fundamentals in several groups of transition economies based on their geographical location and key institutional factors, such as the Association agreements with the EU. He examined the issue of real convergence based on industrial output and monetary convergence using data on producer price index (PPI), consumer price index (CPI), money (M1), and nominal and real interest rates during the period from January 1991 to December 1998. Using a commonly employed panel unit root technique, he tested for convergence within groups

to account for the impact of different institutional and geographical aspects of transition countries. His results indicated considerable real and monetary convergence with real output displaying the greatest degree of convergence across all groups of countries while price-level exhibiting the least. Although the first-round EU candidates showed relatively high degrees of convergence in most variables studied, the highest degree of convergence was displayed by the Baltic States.

The purpose of this paper is twofold. First, we provide additional evidence about real and nominal economic convergence of transition economies by extending Koèenda's (2001) study in two significant ways: (1) we utilize a more stable period (post-93) to examine the robustness of his findings to leaving out the turbulent years of transition, and (2) we investigate the sensitivity of his convergence results by using a more recent panel estimation approach that offers less restrictive assumptions about convergence rates than Koèenda's panel technique. His methodology assumes that countries share *identical* convergence rates to reach an equilibrium level over time. In this paper, we allow for heterogeneity in these rates and investigate the impact of imposing less restriction on convergence results. Second, using the same methodology, we extend the investigation to examine the convergence of the first and second round candidate economies to EU standards. This has important implications for full EU membership preparations by these countries.

In the next section, we describe our panel methodology and compare it with the technique utilized by Koèenda. Section III explains our data and reports the empirical findings. Section IV discusses the policy implications of our findings and concludes the paper.

II. Methodology

In the past decade, a wide variety of empirical work on neoclassical growth model was undertaken. One branch of these studies has utilized time series methodology to test for the key proposition of convergence hypothesis. Based on mostly unit root tests, these papers focus on capturing the persistence of shocks relative to per capita incomes¹. Such (stochastic) convergence applies if per capita income disparities between economies follow a mean-stationary process, so that relative per capita income shocks lead to transitory deviations from any tendency toward convergence. This stationarity would imply that the economies have reached their own steady state and are prone to short-lived shocks.

It is widely known that univariate unit root tests suffer from low statistical power in finite samples. This might lead to failures in rejecting the null-hypothesis. Recently, panel unit root tests have been adopted to address the issue, significantly increasing the power when testing for convergence. Three popular tests include Quah (1992), Im, Pesaran and Shin (IPS, 1997), and Levin and Lin (henceforth LL, 2002).²

Quah considers the simple following dynamic model to improve the power of the univariate Dickey-Fuller procedures

$$(y_{i,t} - \bar{y}_t) = r(y_{i,t-1} - \bar{y}_{t-1}) + e_{i,t} \quad (1)$$

where $y_{i,t} - \bar{y}_t$ is the income disparity from mean output (or benchmark economy) of $i = 1, \dots, N$ countries at time t . He suggests a pooled OLS estimation, in which values of $\tilde{n}$ less

¹ Earlier papers concentrated on the notions of *b* convergence (where poor countries grow faster than rich ones) and *s* convergence (where income variance between poor and rich countries is diminishing). Our analysis concentrates on stochastic convergence, which does not necessitate each country to converge to the same steady state.

than 1 indicate that disparity from the mean is decreasing with time. He not only shows that his statistic would weakly converge to $N(0,1)$ as N, T get large, but also uses this technique to find evidence against convergence to U.S. output.

Levin and Lin (2002) provide a more general testing framework and consider the following three models:

$$\Delta(y_{i,t} - \bar{y}_t) = r(y_{i,t-1} - \bar{y}_{t-1}) + a_{mi}d_{mt} + e_{i,t} \quad (2)$$

for $m = 1, 2, 3$ and where d_{mt} contains deterministic variables; $d_{1t} = \{1\}, d_{2t} = \{1\}, d_{3t} = \{1, t\}$.

In other words, they improve on Quah's method by including fixed effects and individual time trends for each country. Such a framework allows for both different steady states for variable $y_{i,t}$ and different time trends for each country. After establishing that asymptotics of their statistics weakly converge to $N(0,1)$ under the null, they illustrate that no convergence, namely $r = 0$, can be tested against the alternative of income disparities dying out with time, $r < 0$. Koèenda (2001) utilizes this methodology to illustrate the existence of convergence in transition economies³.

It is important to note that both of Quah and LL tests, and consequently Koèenda's paper, assume a common r ($1-r$ represents the convergence rate) and impose homogeneity throughout the countries in each group. This assumption implies that all countries within each group share the same speed of adjustment to steady state in all variables. For example, it assumes that, in the enlarged CEFTA group, Romania and

² It is important to note that the original working paper for the LL approach dates back to 1993 before it was eventually published in 2002. In this sense, the IPS method is the most recent panel test utilized in the literature.

³ Koèenda improves this methodology in two significant ways. First is that his methodology controls for serial correlation in errors. Second, he computes the exact sample critical values for the tests.

the Czech Republic reach a long-run group average at the same rate. The next paragraph describes a less restrictive test that allows differences in convergence rates.

A more recent paper by Im, Pesaran and Shin (1997) relaxes Quah's and LL's assumption of homogeneity in convergence rates due to concerns of bias that may result in heterogeneous panels. Therefore, their test avoids the imposition of identical convergence rates and consequently possible misspecification of the model, which may lead to false inference.⁴ Their method pools N separate independent ADF regressions

$$\Delta(y_{i,t} - \bar{y}_t) = d_i + r_i (y_{i,t-1} - \bar{y}_{t-1}) + \sum_{k=1}^p f_{i,k} \Delta(y_{i,t-k} - \bar{y}_{t-k}) + u_{i,t} \quad (3)$$

,allowing for heterogeneity in r , to test $H_0 : r_i = 0$ for all i against $H_A : r_i < 0$ for at least one i . The limiting distribution for their t-statistic is given as:

$$\sqrt{N} \frac{(\bar{t}_{ADF} - m_{ADF})}{\sqrt{s_{ADF}^2}} \rightarrow N(0,1) \quad (4)$$

where the moments m_{ADF} and s_{ADF}^2 are obtained from Monte Carlo simulations, and $\bar{t}_{ADF}$ is the average estimated ADF t -statistics from the sample. Subsequent Monte-Carlo simulations in their paper compare the size and power performance of their method against LL's. Their results not only demonstrate that the IPS test has significantly greater power compared to the LL test, especially when the number of countries, N , is small, but it also has better size properties than LL's when the choice of ADF order is misspecified.

Differences in performance of these two techniques are caused mainly by the imposition of the homogeneity assumption in LL, which leads to false inference due to misspecification of the model. These disparities will grow as the degree of heterogeneity

⁴ For the recent applications of the IPS approach, see Wu and Chen (2001) and Wu and Shaowen (2001).

within the panels gets larger than used in the IPS simulations. This possibility of misspecification related to LL test constitutes our motivation for re-examining the Koèenda's results and test for convergence in transition economies.

III. Data and Results

As in Koèenda (2001), we test for convergence in seasonally adjusted growth rates in monthly output (industrial production), price (PPI and CPI), money (M1), and nominal and real interest rate spreads series for 5 groups of countries.⁵ These groups are original participants of Central European Free Trade Agreement⁶ (CEFTA), expanded CEFTA after joining of Romania, first⁷ and second⁸ round countries according to their candidacy category for membership to the EU, and finally the Baltic states⁹. The data used in estimations are obtained from *International Financial Statistics* of the IMF.

We concentrate on a more recent and relatively calmer period than did Koèenda, namely 1993:01 to 2000:12, assuming that evidence for convergence, when present, would be stronger with the more recent period. Descriptive statistics in Table 1, especially the standard deviations, illustrate this point by consistently staying below the values in Koèenda tables.

In this paper, real convergence is measured by the industrial production variable. Analysis of nominal convergence starts with tests of monetary policy convergence. Despite using both narrow money (M1) and interest rate spreads to measure monetary convergence in this paper, we believe that interest rate spreads are the better measure of

⁵ Spread is measured by the difference between lending and deposit rates. Real spread is constructed by dividing the nominal spread by inflation.

⁶ The Czech Republic, Hungary, Poland, Slovakia, and Slovenia.

⁷ The Czech Republic, Estonia, Hungary, Poland, and Slovenia.

⁸ Latvia, Romania, the Slovak Republic, Lithuania, and Bulgaria

⁹ Estonia, Latvia, and Lithuania.

monetary policy. Changes in nominal lending and interest rates directly affect demand and time deposits (thus the composition of M1). Thus changes in M1 reflect more policy outcomes than actual implementation of the policy. We therefore rely more on interest rate results when deriving our conclusions. Another part of the tests for nominal convergence is the analysis of CPI and PPI. They not only reflect monetary policy outcomes, but also the trade linkages between sample countries.

Convergence of Transition Economies

Initially, we run LL tests, as utilized by Koèenda's, on the same sets of countries and variables to examine the sensitivity of his results to using an updated dataset. These and subsequent IPS panel unit root tests are applied after demeaning to remove the common time component, which might cause false inference due to cross-correlation within the panels. Comparison of these results in Table 2 with that of Koèenda's shows that coefficient values and their significance levels are similar between the two different time periods. As expected, evidence in Table 2 indicates real and nominal convergence between the countries in each group as reported in Koèenda. Although moving the window of analysis from 1991-1998 to 1993-2000 raises the degree of convergence across all countries, it does not lead to significant differences in the evidence for convergence between Koèenda's findings and that of ours in Table 2.

A key issue in our subsequent estimations is the sensitivity of results to using a different panel approach that imposes a less restrictive assumption about the convergence rates. Application of IPS tests on the same sets of variables shows (Tables 2 to 7) that the strong evidence for convergence found in almost all series in Koèenda does not hold well

when we allow for heterogeneity in convergence rates¹⁰. We also note that average convergence rates of groups from IPS estimations are slightly higher than the convergence rates found using the LL technique.

Looking at the results in Table 3 first for the original CEFTA countries, we observe evidence of real convergence, complementing the finding in Koèenda, who suggests that this result is likely to be driven by the institutional trade linkages between countries through CEFTA. There is strong evidence of monetary policy convergence as given by the spread variable. There is no evidence of price level convergence, indicating that the countries have experienced uncommon price shocks, driven by different types supply and demand shocks.

Adding Romania to the original CEFTA countries generates the results for enlarged CEFTA displayed in Table 4. The evidence of real convergence disappears with the inclusion of Romania. However, we observe price-level convergence for both CPI and PPI, still with no evidence of monetary policy (M1) convergence. The dramatic change in results indicates the fragility of panel tests to adding an outlier country, such as Romania.¹¹

Table 5 reports the results for the first-round candidate countries. There is no evidence of real convergence but significant monetary policy (spread) convergence. Price level convergence and convergence in money supply growth rates are not supported by the data, reflecting the effects of different inflationary and/or supply shocks experienced by the countries.

¹⁰ IPS test is sensitive to residual cross correlation between countries after demeaning, so Monte Carlo simulations or bootstrapping is advised. However, simulation results not included in the paper showed that cross correlation does not constitute a big problem due to the small sample size N .

¹¹ The sensitivity of panel techniques to outliers such as Romania is further discussed later in this section.

Table 6, which reports the findings for the second-round candidate countries, reveals interesting results. Unlike the first-round candidate countries, there is no evidence of real convergence. However, there is significant degree of price-level convergence for both CPI and PPI and money supply (M1) convergence. This evidence is consistent with Koèenda¹². These results suggest that the second-round candidates have made significant progress in price convergence as a result of the significant disinflation policies they implemented after 1993. This leads us to believe that perhaps the gap between the first and second round candidate countries is not as large as expected¹³.

Finally, Table 7 provides the results for the Baltic States. These countries have achieved convergence the most. Except money supply growth rates, there is evidence of convergence in every other variable. The lack of convergence in M1 is due to the currency board regimes adopted by these countries during our sample period.

In summary, our results suggest that significant monetary policy (spread) convergence has been achieved in the transition economies. There is also evidence of real convergence in the original CEFTA, first round, and Baltic countries. Price level convergence is more evident in the Baltic States and second round candidates than others. This latter finding is a function of our sample period, because the first round and CEFTA countries achieved significant price level convergence in the early 1990s. The least convergence is observed in money supply (M1) rates.

Our final point emphasizes a methodological problem related to tests of convergence in general. As suggested by all authors (Quah, LL, and IPS), data series are

¹² Koèenda does not report results for real convergence for the second group candidates due to lack of data.

¹³ This does not, however, mean that the first group countries have not made progress. It simply suggests that given our sample period (post-93), the second-group countries made a significant progress relative to the first group during this period.

demeaned prior to estimations to remove the common time component. Following this guideline in our tests, we note that our results change when the CEFTA group is enlarged with the addition of Romania. When Romania is added to the original CEFTA group in Table 4, IPS tests support convergence in the price series despite rejecting it previously. Close inspection of the data illustrates the high levels of growth in Romanian price series. Having such an outlier that significantly affects the group mean has serious implications on tests for mean reversion.

To further illustrate this point, we use the original CEFTA group and generate an outlier by multiplying Czech Republic growth rate values arbitrarily by 10. Results in Table 8 demonstrate that having outliers may have serious repercussions in tests for convergence. Previous statistics that failed to reject the null of no convergence suddenly reject the null in 3 of the 4 series. Scrutiny of this reversal is beyond the scope of our current paper, but will be covered in future research.

In Table 9, we summarize the differences between Koèenda's results and ours. The key difference is that our evidence indicates less convergence in the price indexes and M1 than what his results indicate. Nominal spread results are also sensitive to the methodology used. We find stronger convergence in nominal spreads for the Baltic States and weaker convergence for the CEFTA-5 members than what Koèenda reported. We also showed that the results of panel tests in general are quite sensitive to outliers in data.

Convergence of Transition Economies to EU Standards

Table 10 reports the progress made by the first round transition economies as to their convergence to EU economic standards. The results indicate significant real and monetary policy convergence. The latter is given by both M1 and nominal interest rate spread results. There is no evidence of convergence in real spreads. This result is likely

driven by the price level results as there is no indication of significant price level convergence between the first round candidate countries and the EU. This finding suggests that changes in price indexes are not merely dominated by changes in monetary policy, but they reflect more the effects of trade channels via the CEFTA.

Turning to results for the second round candidate countries, the results, reported in Table 11, show no evidence of real convergence, but significant price level convergence with respect to EU. This outcome also is probably the result of the price indexes being more related to strong trade linkages between the transition countries and EU, rather than being affected more by monetary policy conditions. This notion is further supported by the finding of no convergence in monetary policy (M1) between the second round countries and EU.

IV. Policy Implications and Conclusions

We have tested real and monetary stochastic convergence in transition economies, using macroeconomic data from January 1993 to December 2000. Using a different sample period but employing the same method used by Koèenda has not produced qualitatively different inference about convergence. However, utilizing a less restricted panel test that does not impose the assumption of homogeneity in convergence rates has yielded less degree of convergence in the CPI, PPI, and M1 than reported by Koèenda. The results suggest that the inference about convergence is not sensitive to sample period used, but to the restrictions of the panel technique employed by practitioner.

Extending the convergence issue to the EU, we have also investigated convergence of the first and second round candidate economies with the EU. Evidence has indicated that the first-round EU candidates have made significant progress in real

output and monetary policy convergence with respect to EU, suggesting that these countries are moving in the same direction as EU economies. History on accession shows that moving in the right economic direction is desirable for further progress in the enlargement attempts. The lack of significant price level convergence can be explained by different degrees of trade linkages and real exchange shocks experienced by these countries.¹⁴

Finally, we have found significant real convergence between the first round candidate economies and EU, but not for the second round candidate countries. Since we used industrial production, a real or supply shock variable, our findings indicate that the second-round candidate countries in our sample have experienced different supply-side shocks, thus displayed no convergence with real shocks in other countries within the group. An important policy implication of this result is that second-round candidate countries need to retain some measure of policy autonomy to deal with productivity shocks whose magnitude and timing may differ significantly from the shocks affecting other countries in that group. In terms of exchange rate policy, this signals more flexible exchange rate policies for these countries.

¹⁴ Brada (1998) argues that, as a result of diverse fiscal and monetary policies, real exchange rates in the transition economies should follow a different path. Dibooglu and Kutan (2001) provide evidence that sources of real exchange rate fluctuations have been different in transition economies.

References

- Backè, Peter, Fidrmuc, Jarko, Reininger, Thomas and Schardax, Franz. "Price Dynamics in Central and Eastern European EU Accession Countries", Working Paper No. 61, Oesterreichische Nationalbank, February 2002.
- Brada, Josef C, "Introduction: Exchange Rates, Capital Flows, and Commercial Policies in Transition Economies", *Journal of Comparative Economics*, Vol. 26, No. 4, Dec 1998, pp. 613-620.
- Brada, Josef C. and Kutan, Ali M. "The Convergence of Monetary Policy between Candidate Countries and the European Union", *Economic Systems*, Vol. 25, No. 3, September 2001, pp. 215-231.
- Dibooglu, Selahattin and Kutan, Ali M. "Sources of Real Exchange Rate Fluctuations in Transition Economies: The Case of Poland and Hungary", *Journal of Comparative Economics*, Vol. 29, June 2001, pp. 257-275.
- Desai, Padma, "Macroeconomic Fragility and Exchange Rate Vulnerability: A Cautionary Record of Transition Economies", *Journal of Comparative Economics*, Vol. 26, December 1998, pp. 621-41.
- Estrin, Saul, Urga, Giovanni, and Lazarova, Stepana. "Testing for Ongoing Convergence in Transition Economies, 1970 to 1988", *Journal of Comparative Economics*, Vol. 29, 2001, pp. 677-681.
- Im, K. S., Pesaran, M. H. and Y. Shin. "Testing for Unit Roots in Heterogeneous Panels" unpublished manuscript, Cambridge University, 1997.
- Kutan, Ali M. and Brada, Josef C., "The Evolution of Monetary Policy in Transition Economies", *The Federal Reserve Bank of St. Louis Review*, Vol. 82, No. 2, March/April, 2000, pp. 31-40.
- Koèenda, Evžen. "Macroeconomic Convergence in Transition Economies", *Journal of Comparative Economics*, Vol. 29, No. 1, March 2001, pp. 1-23.
- Levin, A. and C. F. Lin. "Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties" *Journal of Econometrics*, Vol. 108, No. 1, May 2002, pp. 1-24.
- Korhonen, Iikka and Fidrmuc, Jarko. "Similarity of Supply and Demand Shocks between the Euro Area and the Accession Countries", *Focus on Transition*, No.2, 2001, pp. 26-42.
- Quah, D. "International Patterns of Growth: Persistence in Cross-Country Disparities", unpublished manuscript, London School of Economics, 1992.

- Richards, Anthony J. and Tersman, Gunnar H.R. "Growth, Nontradables, and Price Convergence in the Baltics", *Journal of Comparative Economics*, Vol. 23, No. 2, October 1996, pp. 121-145.
- Wu, Jhy-Lin and Chen, -Show-Lin. "Mean Reversion of Interest Rates in the Eurocurrency Market", *Oxford Bulletin of Economics and Statistics*, 63(4), September 2001, pp. 459-73.
- Wu, Jyh-Lin; Wu, Shaowen. "Is Purchasing Power Parity Overvalued?", *Journal of Money, Credit, and Banking*, 33(3), August 2001, pp. 804-12.

TABLES

Table 1: Descriptive Statics of Percentage Growth Rates: Averages (Standard deviations)

	<i>Industrial Production</i>	<i>PPI</i>	<i>CPI</i>	<i>M1</i>	<i>Nominal Spr.</i>	<i>Real Spr.</i>
<i>Czech</i>	4.96 (8.6)	4.08 (2.1)	7.29 (3.0)	11.93 (18.29)	1.83(0.1)	1.00(0.7)
<i>Slovak</i>	3.61 (4.9)	8.80 (3.2)	6.12 (3.4)	6.40 (9.4)	1.55(0.2)	0.74(0.3)
<i>Poland</i>	5.06 (9.2)	13.31 (7.8)	16.25 (7.7)	23.49 (10.3)	1.23(0.2)	0.39(0.3)
<i>Hungary</i>	9.59 (7.3)	14.40 (6.7)	16.05 (5.6)	14.38 (6.1)	1.29(0.1)	0.33(0.1)
<i>Slovenia</i>	2.96 (4.2)	8.02 (4.6)	10.42 (3.7)	26.21 (15.6)	1.54(0.1)	0.82(0.2)
<i>Estonia</i>	4.25 (15.7)	11.86 (10.8)	11.86 (10.8)	28.57 (23.4)	2.25(0.4)	1.04(0.8)
<i>Latvia</i>	7.21 (20.0)	12.45 (10.4)	4.50 (6.1)	16.21 (13.8)	2.44(0.5)	2.22(1.2)
<i>Lithuania</i>	-2.06 (22.4)	31.11 (47.3)	34.68 (59.9)	23.09 (23.5)	1.69(0.5)	4.71(13.6)
<i>Romania</i>	-0.90 (11.6)	54.16 (33.8)	52.94 (32.9)	43.32 (13.8)	NA	NA
<i>Bulgaria</i>	3.09 (12.2)	67.20 (84.3)	71.02 (105.8)	63.52 (68.2)	2.51(1.2)	-1.04(17.8)

Note: NA means data not available.

Table 2: LL Methodology Results for all Groups (coefficients and t-statistics)

<i>Group</i>	<i>Industrial Production</i>	<i>PPI</i>	<i>CPI</i>	<i>M1</i>	<i>Nominal Spr.</i>	<i>Real Spr.</i>
	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>
<i>CEFTA-5</i>	0.82***	0.97***	0.98***	0.96***	0.97***	0.95***
<i>CEFTA-6</i>	0.86***	0.95***	0.94***	0.96***		
<i>First group</i>	0.85***	0.97***	0.97***	0.95***	0.97***	0.94***
<i>Second group</i>	0.80***	0.94***	0.96***	0.97**		
<i>Baltic</i>	0.82***	0.92***	0.84***	0.93***	0.82***	0.56***

Note: CEFTA-5 refers to the original CEFTA countries while CEFTA-6 is the enlarged one. Interest rate results for CEFTA-6 and Group-2 are not reported due to lack of data for Romanian interest rates. Since sample sizes are similar, we use the same critical values derived by Koëenda simulations. For this and the remaining tables *** (**) indicates 99% (95%) significance while * represents significance at 90%.

Table 3: IPS Results for Original CEFTA Countries (coefficients and individual t-statistics)

	<i>Industrial Production</i>	<i>PPI</i>	<i>CPI</i>	<i>M1</i>	<i>Nominal Spr.</i>	<i>Real Spr.</i>
	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>
<i>Czech</i>	0.50	0.93	0.95	0.92	0.79	0.82
<i>Hungary</i>	0.32	0.95	0.94	0.96	0.86	0.89
<i>Poland</i>	0.83	0.89	0.94	0.93	0.83	0.72
<i>Slovak</i>	0.79	0.84	0.90	0.94	0.66	0.85
<i>Slovenia</i>	0.63	0.91	0.90	0.89	0.31	0.74
<i>t-ave.</i>	-2.73	-2.17	-2.03	-1.62	-2.69	-2.96
<i>z-stat.</i>	-1.71**	-0.18	0.21	1.32	-1.60*	-2.36***

Note: T=96 for all series in the following tables.

represents here and in the following tables the series where a time trend was used. t-statistics averages are compared to simulated IPS (1997) critical values of mean and variance -2.11 and 0.66, respectively. Critical values for no time trend are -1.51 with variance 0.76.

Table 4: IPS Results for Enlarged CEFTA Countries (coefficients and individual t-statistics)

	Industrial Production	PPI	CPI	M1
	Coeff.	Coeff.	Coeff.	Coeff.
Czech	0.64	0.89	0.91	0.79
Hungary	0.62	0.88	0.95	0.97
Poland	0.72	0.90	0.96	0.92
Romania	0.82	0.86	0.94	0.82
Slovak	0.84	0.81	0.96	0.92
Slovenia	0.74	0.86	0.938	0.87
t-ave.	-2.34	-3.69	-2.20	-2.07
z-stat.	-0.69	-4.78***	-1.94**	0.09

Notes: Interest rate results are not reported due to lack of data for Romanian interest rates.

Table 5: IPS Results for the First-round Candidate Countries (coefficients and individual t-statistics)

	Industrial Production	PPI	CPI	M1	Nominal Spr.	Real Spr.
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Czech	0.77	0.94	0.96	0.94	0.60	0.77
Estonia	0.85	0.92	0.90	0.94	0.51	0.66
Hungary	0.73	0.95	0.94	0.93	0.75	0.86
Poland	0.73	0.91	0.87	0.90	0.71	0.80
Slovenia	0.67	0.89	0.89	0.88	0.55	0.83
t-ave.	-2.10	-2.17	-2.34	-2.10	-3.80	-2.79
z-stat.	-1.51*	-0.17	-0.65	0.01	-4.65***	-1.88**

Table 6: IPS Results for the Second-round Candidate Countries (coefficients and individual t-statistics)

	Industrial Production	PPI	CPI	M1
	Coeff.	Coeff.	Coeff.	Coeff.
Bulgaria	0.25	0.93	0.93	0.94
Latvia	0.83	0.94	0.94	0.92
Lithuania	0.84	0.94	0.95	0.91
Romania	0.44	0.45	0.71	0.92
Slovak	0.28	0.94	0.94	0.93
t-ave.	-1.61	-3.72	-3.54	-2.21
z-stat.	1.36	-5.67***	-3.94***	-1.80**

Notes: Interest rate results are not reported due to lack of data for Romanian interest rates.

Table 7: IPS Results for Baltic States (coefficients and individual t-statistics)

	Industrial Production	PPI	CPI	M1	Nominal Spr.	Real Spr.
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Estonia	0.85	0.90	0.765	0.94	0.56	0.12
Latvia	0.64	0.91	0.70	0.90	0.43	0.20
Lithuania	0.85	0.94	0.68	0.90	0.42	0.16
t-ave.	-2.18	-2.21	-7.80	-1.99	-3.29	-3.55
z-stat.	-1.33*	-1.40*	-12.14***	-0.97	-2.53***	-3.08***

<i>Table 8: IPS Results for CEFTA Countries with Outlier (coefficients and individual t-statistics)</i>						
	<i>Industrial Production</i>	<i>PPI</i>	<i>CPI</i>	<i>M1</i>	<i>Nominal Spread</i>	<i>Real Spread</i>
	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>
<i>Czech</i>	0.68	0.86	0.93	0.91	0.91	0.87
<i>Hungary</i>	0.65	0.88	0.93	0.93	0.92	0.88
<i>Poland</i>	0.68	0.90	0.94	0.92	0.93	0.85
<i>Slovak</i>	0.75	0.85	0.93	0.91	0.88	0.88
<i>Slovenia</i>	0.65	0.88	0.92	0.91	0.88	0.88
<i>t-ave.</i>	-2.65	-3.16	-1.95	-3.11	-1.80	-2.57
<i>z-stat.</i>	-1.50*	-2.91***	0.43	-11.85***	-0.76	-2.73***

Note: IPS test is applied to the original CEFTA countries after having multiplied the Czech Republic growth rates arbitrarily by 10. Comparison of these results with those of Table 3 shows that results for convergence change significantly due to an outlier in the dataset.

<i>Table 9: Comparison of results: Is there stochastic convergence?</i>						
<i>Group</i>	<i>Industrial Production</i>		<i>PPI</i>		<i>CPI</i>	
	<i>Koèenda</i>	<i>Ours</i>	<i>Koèenda</i>	<i>Ours</i>	<i>Koèenda</i>	<i>Ours</i>
<i>CEFTA-5</i>	Yes	Yes	Yes	No	Yes	No
<i>CEFTA-6</i>	Yes	No	Yes	Yes	Yes	Yes
<i>First group</i>	Yes	Yes	Yes	No	Yes	No
<i>Second group</i>	N/A	No	N/A	Yes	Yes	Yes
<i>Baltic</i>	Yes	Yes	Yes	Yes	Yes	Yes
	<i>M1</i>		<i>Nominal Spr.</i>		<i>Real Spr.</i>	
	<i>Koèenda</i>	<i>Ours</i>	<i>Koèenda</i>	<i>Ours</i>	<i>Koèenda</i>	<i>Ours</i>
<i>CEFTA-5</i>	Yes	No	Yes	Weak	Yes	Yes
<i>CEFTA-6</i>	Yes	No				
<i>First group</i>	Yes	No	Yes	Yes	Yes	Yes
<i>Second group</i>	Yes	Yes				
<i>Baltic</i>	Yes	No	Weak	Yes	Yes	Yes

Notes: N/A indicates that estimation is not included in Koèenda due to lack of data. Weak indicates evidence of convergence at 90% significance

<i>Table 10: IPS Results for the First-round Candidate Countries (convergence to EU standard)</i>						
	<i>Industrial Production</i>	<i>PPI</i>	<i>CPI</i>	<i>M1</i>	<i>Nominal Spr.</i>	<i>Real Spr.</i>
	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>
<i>Czech</i>	0.66	0.89	0.91	0.87	0.95	0.78
<i>Estonia</i>	0.82	0.92	0.91	0.94	0.72	0.80
<i>Hungary</i>	0.03	0.93	0.93	0.93	0.96	0.83
<i>Poland</i>	0.77	0.91	0.89	0.93	0.93	0.84
<i>Slovenia</i>	0.77	0.92	0.92	0.81	0.91	0.84
<i>t-ave.</i>	-3.11	-2.23	-2.47	-2.59	-2.59	-2.04
<i>z-stat.</i>	-2.76***	-0.33	-1.01	-1.34*	-2.79***	0.18

<i>Table 11: IPS Results for the Second-round Candidate Countries (convergence to EU standard)</i>				
	<i>Industrial Production¹.</i>	<i>PPI.</i>	<i>CPI</i>	<i>M1.</i>
	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>	<i>Coeff.</i>
<i>Bulgaria</i>		0.93	0.93	0.94
<i>Latvia</i>	0.83	0.88	0.97	0.90
<i>Lithuania</i>	0.82	0.94	0.97	0.78
<i>Romania</i>	0.91	0.86	0.94	0.89
<i>Slovak</i>	0.52	0.79	0.91	0.97
<i>t-ave.</i>	-2.13	-2.69	-2.27	-2.42
<i>z-stat.</i>	-0.05	-1.61*	-1.95**	-0.87

Notes: Interest rate results are not reported due to lack of data for Romanian interest rates.

¹Bulgaria is omitted from the estimation due to large breaks in the data.

2008		
B01-08	Euro-Diplomatie durch gemeinsame „Wirtschaftsregierung“	<i>Martin Seidel</i>
2007		
B03-07	Löhne und Steuern im Systemwettbewerb der Mitgliedstaaten der Europäischen Union	<i>Martin Seidel</i>
B02-07	Konsolidierung und Reform der Europäischen Union	<i>Martin Seidel</i>
B01-07	The Ratification of European Treaties - Legal and Constitutional Basis of a European Referendum.	<i>Martin Seidel</i>
2006		
B03-06	Financial Frictions, Capital Reallocation, and Aggregate Fluctuations	<i>Jürgen von Hagen, Haiping Zhang</i>
B02-06	Financial Openness and Macroeconomic Volatility	<i>Jürgen von Hagen, Haiping Zhang</i>
B01-06	A Welfare Analysis of Capital Account Liberalization	<i>Jürgen von Hagen, Haiping Zhang</i>
2005		
B11-05	Das Kompetenz- und Entscheidungssystem des Vertrages von Rom im Wandel seiner Funktion und Verfassung	<i>Martin Seidel</i>
B10-05	Die Schutzklauseln der Beitrittsverträge	<i>Martin Seidel</i>
B09-05	Measuring Tax Burdens in Europe	<i>Guntram B. Wolff</i>
B08-05	Remittances as Investment in the Absence of Altruism	<i>Gabriel González-König</i>
B07-05	Economic Integration in a Multicore World?	<i>Christian Volpe Martincus, Jennifer Pédussel Wu</i>
B06-05	Banking Sector (Under?)Development in Central and Eastern Europe	<i>Jürgen von Hagen, Valeriya Dinger</i>
B05-05	Regulatory Standards Can Lead to Predation	<i>Stefan Lutz</i>
B04-05	Währungspolitik als Sozialpolitik	<i>Martin Seidel</i>
B03-05	Public Education in an Integrated Europe: Studying to Migrate and Teaching to Stay?	<i>Panu Poutvaara</i>
B02-05	Voice of the Diaspora: An Analysis of Migrant Voting Behavior	<i>Jan Fidrmuc, Orla Doyle</i>
B01-05	Macroeconomic Adjustment in the New EU Member States	<i>Jürgen von Hagen, Iulia Traistaru</i>
2004		
B33-04	The Effects of Transition and Political Instability On Foreign Direct Investment Inflows: Central Europe and the Balkans	<i>Josef C. Brada, Ali M. Kutan, Tanner M. Yigit</i>
B32-04	The Choice of Exchange Rate Regimes in Developing Countries: A Multinomial Panel Analysis	<i>Jürgen von Hagen, Jizhong Zhou</i>
B31-04	Fear of Floating and Fear of Pegging: An Empirical Analysis of De Facto Exchange Rate Regimes in Developing Countries	<i>Jürgen von Hagen, Jizhong Zhou</i>
B30-04	Der Vollzug von Gemeinschaftsrecht über die Mitgliedstaaten und seine Rolle für die EU und den Beitrittsprozess	<i>Martin Seidel</i>
B29-04	Deutschlands Wirtschaft, seine Schulden und die Unzulänglichkeiten der einheitlichen Geldpolitik im Eurosystem	<i>Dieter Spethmann, Otto Steiger</i>
B28-04	Fiscal Crises in U.S. Cities: Structural and Non-structural Causes	<i>Guntram B. Wolff</i>
B27-04	Firm Performance and Privatization in Ukraine	<i>Galyna Grygorenko, Stefan Lutz</i>
B26-04	Analyzing Trade Opening in Ukraine: Effects of a Customs Union with the EU	<i>Oksana Harbuzyuk, Stefan Lutz</i>
B25-04	Exchange Rate Risk and Convergence to the Euro	<i>Lucjan T. Orlowski</i>
B24-04	The Endogeneity of Money and the Eurosystem	<i>Otto Steiger</i>
B23-04	Which Lender of Last Resort for the Eurosystem?	<i>Otto Steiger</i>
B22-04	Non-Discretionary Monetary Policy: The Answer for Transition Economies?	<i>Elham-Mafi Kreft, Steven F. Kreft</i>
B21-04	The Effectiveness of Subsidies Revisited: Accounting for Wage and Employment Effects in Business R+D	<i>Volker Reintaler, Guntram B. Wolff</i>
B20-04	Money Market Pressure and the Determinants of Banking Crises	<i>Jürgen von Hagen, Tai-kuang Ho</i>
B19-04	Die Stellung der Europäischen Zentralbank nach dem Verfassungsvertrag	<i>Martin Seidel</i>

B18-04	Transmission Channels of Business Cycles Synchronization in an Enlarged EMU	<i>Iulia Traistaru</i>
B17-04	Foreign Exchange Regime, the Real Exchange Rate and Current Account Sustainability: The Case of Turkey	<i>Sübüdey Togan, Hasan Ersel</i>
B16-04	Does It Matter Where Immigrants Work? Traded Goods, Non-traded Goods, and Sector Specific Employment	<i>Harry P. Bowen, Jennifer Pédussel Wu</i>
B15-04	Do Economic Integration and Fiscal Competition Help to Explain Local Patterns?	<i>Christian Volpe Martincus</i>
B14-04	Euro Adoption and Maastricht Criteria: Rules or Discretion?	<i>Jiri Jonas</i>
B13-04	The Role of Electoral and Party Systems in the Development of Fiscal Institutions in the Central and Eastern European Countries	<i>Sami Yläoutinen</i>
B12-04	Measuring and Explaining Levels of Regional Economic Integration	<i>Jennifer Pédussel Wu</i>
B11-04	Economic Integration and Location of Manufacturing Activities: Evidence from MERCOSUR	<i>Pablo Sanguinetti, Iulia Traistaru, Christian Volpe Martincus</i>
B10-04	Economic Integration and Industry Location in Transition Countries	<i>Laura Resmini</i>
B09-04	Testing Creditor Moral Hazard in Sovereign Bond Markets: A Unified Theoretical Approach and Empirical Evidence	<i>Ayşe Y. Evrensel, Ali M. Kutan</i>
B08-04	European Integration, Productivity Growth and Real Convergence	<i>Taner M. Yigit, Ali M. Kutan</i>
B07-04	The Contribution of Income, Social Capital, and Institutions to Human Well-being in Africa	<i>Mina Balamoune-Lutz, Stefan H. Lutz</i>
B06-04	Rural Urban Inequality in Africa: A Panel Study of the Effects of Trade Liberalization and Financial Deepening	<i>Mina Balamoune-Lutz, Stefan H. Lutz</i>
B05-04	Money Rules for the Eurozone Candidate Countries	<i>Lucjan T. Orlowski</i>
B04-04	Who is in Favor of Enlargement? Determinants of Support for EU Membership in the Candidate Countries' Referenda	<i>Orla Doyle, Jan Fidrmuc</i>
B03-04	Over- and Underbidding in Central Bank Open Market Operations Conducted as Fixed Rate Tender	<i>Ulrich Bindseil</i>
B02-04	Total Factor Productivity and Economic Freedom Implications for EU Enlargement	<i>Ronald L. Moomaw, Euy Seok Yang</i>
B01-04	Die neuen Schutzklauseln der Artikel 38 und 39 des Beitrittsvertrages: Schutz der alten Mitgliedstaaten vor Störungen durch die neuen Mitgliedstaaten	<i>Martin Seidel</i>
2003		
B29-03	Macroeconomic Implications of Low Inflation in the Euro Area	<i>Jürgen von Hagen, Boris Hofmann</i>
B28-03	The Effects of Transition and Political Instability on Foreign Direct Investment: Central Europe and the Balkans	<i>Josef C. Brada, Ali M. Kutan, Taner M. Yigit</i>
B27-03	The Performance of the Euribor Futures Market: Efficiency and the Impact of ECB Policy Announcements (Electronic Version of International Finance)	<i>Kerstin Bernoth, Juergen von Hagen</i>
B26-03	Sovereign Risk Premia in the European Government Bond Market (überarbeitete Version zum Herunterladen)	<i>Kerstin Bernoth, Juergen von Hagen, Ludger Schulknecht</i>
B25-03	How Flexible are Wages in EU Accession Countries?	<i>Anna Iara, Iulia Traistaru</i>
B24-03	Monetary Policy Reaction Functions: ECB versus Bundesbank	<i>Bernd Hayo, Boris Hofmann</i>
B23-03	Economic Integration and Manufacturing Concentration Patterns: Evidence from Mercosur	<i>Iulia Traistaru, Christian Volpe Martincus</i>
B22-03	Reformzwänge innerhalb der EU angesichts der Osterweiterung	<i>Martin Seidel</i>
B21-03	Reputation Flows: Contractual Disputes and the Channels for Inter-Firm Communication	<i>William Pyle</i>
B20-03	Urban Primacy, Gigantism, and International Trade: Evidence from Asia and the Americas	<i>Ronald L. Moomaw, Mohammed A. Alwosabi</i>
B19-03	An Empirical Analysis of Competing Explanations of Urban Primacy Evidence from Asia and the Americas	<i>Ronald L. Moomaw, Mohammed A. Alwosabi</i>

B18-03	The Effects of Regional and Industry-Wide FDI Spillovers on Export of Ukrainian Firms	<i>Stefan H. Lutz, Oleksandr Talavera, Sang-Min Park</i>
B17-03	Determinants of Inter-Regional Migration in the Baltic States	<i>Mihails Hazans</i>
B16-03	South-East Europe: Economic Performance, Perspectives, and Policy Challenges	<i>Iulia Traistaru, Jürgen von Hagen</i>
B15-03	Employed and Unemployed Search: The Marginal Willingness to Pay for Attributes in Lithuania, the US and the Netherlands	<i>Jos van Ommeren, Mihails Hazans</i>
B14-03	FCIs and Economic Activity: Some International Evidence	<i>Charles Goodhart, Boris Hofmann</i>
B13-03	The IS Curve and the Transmission of Monetary Policy: Is there a Puzzle?	<i>Charles Goodhart, Boris Hofmann</i>
B12-03	What Makes Regions in Eastern Europe Catching Up? The Role of Foreign Investment, Human Resources, and Geography	<i>Gabriele Tondl, Goran Vuksic</i>
B11-03	Die Weisungs- und Herrschaftsmacht der Europäischen Zentralbank im europäischen System der Zentralbanken - eine rechtliche Analyse	<i>Martin Seidel</i>
B10-03	Foreign Direct Investment and Perceptions of Vulnerability to Foreign Exchange Crises: Evidence from Transition Economies	<i>Josef C. Brada, Vladimír Tomsík</i>
B09-03	The European Central Bank and the Eurosystem: An Analysis of the Missing Central Monetary Institution in European Monetary Union	<i>Gunnar Heinsohn, Otto Steiger</i>
B08-03	The Determination of Capital Controls: Which Role Do Exchange Rate Regimes Play?	<i>Jürgen von Hagen, Jizhong Zhou</i>
B07-03	Nach Nizza und Stockholm: Stand des Binnenmarktes und Prioritäten für die Zukunft	<i>Martin Seidel</i>
B06-03	Fiscal Discipline and Growth in Euroland. Experiences with the Stability and Growth Pact	<i>Jürgen von Hagen</i>
B05-03	Reconsidering the Evidence: Are Eurozone Business Cycles Converging?	<i>Michael Massmann, James Mitchell</i>
B04-03	Do Ukrainian Firms Benefit from FDI?	<i>Stefan H. Lutz, Oleksandr Talavera</i>
B03-03	Europäische Steuerkoordination und die Schweiz	<i>Stefan H. Lutz</i>
B02-03	Commuting in the Baltic States: Patterns, Determinants, and Gains	<i>Mihails Hazans</i>
B01-03	Die Wirtschafts- und Währungsunion im rechtlichen und politischen Gefüge der Europäischen Union	<i>Martin Seidel</i>
2002		
B30-02	An Adverse Selection Model of Optimal Unemployment Assurance	<i>Marcus Hagedorn, Ashok Kaul, Tim Mennel</i>
B29B-02	Trade Agreements as Self-protection	<i>Jennifer Pédussel Wu</i>
B29A-02	Growth and Business Cycles with Imperfect Credit Markets	<i>Debajyoti Chakrabarty</i>
B28-02	Inequality, Politics and Economic Growth	<i>Debajyoti Chakrabarty</i>
B27-02	Poverty Traps and Growth in a Model of Endogenous Time Preference	<i>Debajyoti Chakrabarty</i>
B26-02	Monetary Convergence and Risk Premiums in the EU Candidate Countries	<i>Lucjan T. Orlowski</i>
B25-02	Trade Policy: Institutional Vs. Economic Factors	<i>Stefan Lutz</i>
B24-02	The Effects of Quotas on Vertical Intra-industry Trade	<i>Stefan Lutz</i>
B23-02	Legal Aspects of European Economic and Monetary Union	<i>Martin Seidel</i>
B22-02	Der Staat als <i>Lender of Last Resort</i> - oder: Die Achillesverse des Eurosystems	<i>Otto Steiger</i>
B21-02	Nominal and Real Stochastic Convergence Within the Transition Economies and to the European Union: Evidence from Panel Data	<i>Ali M. Kutan, Taner M. Yigit</i>
B20-02	The Impact of News, Oil Prices, and International Spillovers on Russian Financial Markets	<i>Bernd Hayo, Ali M. Kutan</i>

B19-02	East Germany: Transition with Unification, Experiments and Experiences	<i>Jürgen von Hagen, Rolf R. Strauch, Guntram B. Wolff</i>
B18-02	Regional Specialization and Employment Dynamics in Transition Countries	<i>Iulia Traistaru, Guntram B. Wolff</i>
B17-02	Specialization and Growth Patterns in Border Regions of Accession Countries	<i>Laura Resmini</i>
B16-02	Regional Specialization and Concentration of Industrial Activity in Accession Countries	<i>Iulia Traistaru, Peter Nijkamp, Simonetta Longhi</i>
B15-02	Does Broad Money Matter for Interest Rate Policy?	<i>Matthias Brückner, Andreas Schaber</i>
B14-02	The Long and Short of It: Global Liberalization, Poverty and Inequality	<i>Christian E. Weller, Adam Hersch</i>
B13-02	De Facto and Official Exchange Rate Regimes in Transition Economies	<i>Jürgen von Hagen, Jizhong Zhou</i>
B12-02	Argentina: The Anatomy of A Crisis	<i>Jiri Jonas</i>
B11-02	The Eurosystem and the Art of Central Banking	<i>Gunnar Heinsohn, Otto Steiger</i>
B10-02	National Origins of European Law: Towards an Autonomous System of European Law?	<i>Martin Seidel</i>
B09-02	Monetary Policy in the Euro Area - Lessons from the First Years	<i>Volker Clausen, Bernd Hayo</i>
B08-02	Has the Link Between the Spot and Forward Exchange Rates Broken Down? Evidence From Rolling Cointegration Tests	<i>Ali M. Kutan, Su Zhou</i>
B07-02	Perspektiven der Erweiterung der Europäischen Union	<i>Martin Seidel</i>
B06-02	Is There Asymmetry in Forward Exchange Rate Bias? Multi-Country Evidence	<i>Su Zhou, Ali M. Kutan</i>
B05-02	Real and Monetary Convergence Within the European Union and Between the European Union and Candidate Countries: A Rolling Cointegration Approach	<i>Josef C. Brada, Ali M. Kutan, Su Zhou</i>
B04-02	Asymmetric Monetary Policy Effects in EMU	<i>Volker Clausen, Bernd Hayo</i>
B03-02	The Choice of Exchange Rate Regimes: An Empirical Analysis for Transition Economies	<i>Jürgen von Hagen, Jizhong Zhou</i>
B02-02	The Euro System and the Federal Reserve System Compared: Facts and Challenges	<i>Karlheinz Ruckriegel, Franz Seitz</i>
B01-02	Does Inflation Targeting Matter?	<i>Manfred J. M. Neumann, Jürgen von Hagen</i>
2001		
B29-01	Is Kazakhstan Vulnerable to the Dutch Disease?	<i>Karlygash Kuralbayeva, Ali M. Kutan, Michael L. Wyzan</i>
B28-01	Political Economy of the Nice Treaty: Rebalancing the EU Council. The Future of European Agricultural Policies	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B27-01	Investor Panic, IMF Actions, and Emerging Stock Market Returns and Volatility: A Panel Investigation	<i>Bernd Hayo, Ali M. Kutan</i>
B26-01	Regional Effects of Terrorism on Tourism: Evidence from Three Mediterranean Countries	<i>Konstantinos Drakos, Ali M. Kutan</i>
B25-01	Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications	<i>Lucjan T. Orlowski</i>
B24-01	Disintegration and Trade	<i>Jarko and Jan Fidrmuc</i>
B23-01	Migration and Adjustment to Shocks in Transition Economies	<i>Jan Fidrmuc</i>
B22-01	Strategic Delegation and International Capital Taxation	<i>Matthias Brückner</i>
B21-01	Balkan and Mediterranean Candidates for European Union Membership: The Convergence of Their Monetary Policy With That of the European Central Bank	<i>Josef C. Brada, Ali M. Kutan</i>
B20-01	An Empirical Inquiry of the Efficiency of Intergovernmental Transfers for Water Projects Based on the WRDA Data	<i>Anna Rubinchik-Pessach</i>
B19-01	Detrending and the Money-Output Link: International Evidence	<i>R.W. Hafer, Ali M. Kutan</i>

B18-01	Monetary Policy in Unknown Territory. The European Central Bank in the Early Years	<i>Jürgen von Hagen, Matthias Brückner</i>
B17-01	Executive Authority, the Personal Vote, and Budget Discipline in Latin American and Caribbean Countries	<i>Mark Hallerberg, Patrick Marier</i>
B16-01	Sources of Inflation and Output Fluctuations in Poland and Hungary: Implications for Full Membership in the European Union	<i>Selahattin Dibooglu, Ali M. Kutan</i>
B15-01	Programs Without Alternative: Public Pensions in the OECD	<i>Christian E. Weller</i>
B14-01	Formal Fiscal Restraints and Budget Processes As Solutions to a Deficit and Spending Bias in Public Finances - U.S. Experience and Possible Lessons for EMU	<i>Rolf R. Strauch, Jürgen von Hagen</i>
B13-01	German Public Finances: Recent Experiences and Future Challenges	<i>Jürgen von Hagen, Rolf R. Strauch</i>
B12-01	The Impact of Eastern Enlargement On EU-Labour Markets. Pensions Reform Between Economic and Political Problems	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B11-01	Inflationary Performance in a Monetary Union With Large Wage Setters	<i>Lilia Cavallar</i>
B10-01	Integration of the Baltic States into the EU and Institutions of Fiscal Convergence: A Critical Evaluation of Key Issues and Empirical Evidence	<i>Ali M. Kutan, Niina Pautola-Mol</i>
B09-01	Democracy in Transition Economies: Grease or Sand in the Wheels of Growth?	<i>Jan Fidrmuc</i>
B08-01	The Functioning of Economic Policy Coordination	<i>Jürgen von Hagen, Susanne Mundschenk</i>
B07-01	The Convergence of Monetary Policy Between Candidate Countries and the European Union	<i>Josef C. Brada, Ali M. Kutan</i>
B06-01	Opposites Attract: The Case of Greek and Turkish Financial Markets	<i>Konstantinos Drakos, Ali M. Kutan</i>
B05-01	Trade Rules and Global Governance: A Long Term Agenda. The Future of Banking.	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B04-01	The Determination of Unemployment Benefits	<i>Rafael di Tella, Robert J. McCulloch</i>
B03-01	Preferences Over Inflation and Unemployment: Evidence from Surveys of Happiness	<i>Rafael di Tella, Robert J. McCulloch, Andrew J. Oswald</i>
B02-01	The Konstanz Seminar on Monetary Theory and Policy at Thirty	<i>Michele Fratianni, Jürgen von Hagen</i>
B01-01	Divided Boards: Partisanship Through Delegated Monetary Policy	<i>Etienne Farvaque, Gael Lagadec</i>
2000		
B20-00	Breakin-up a Nation, From the Inside	<i>Etienne Farvaque</i>
B19-00	Income Dynamics and Stability in the Transition Process, general Reflections applied to the Czech Republic	<i>Jens Hölscher</i>
B18-00	Budget Processes: Theory and Experimental Evidence	<i>Karl-Martin Ehrhart, Roy Gardner, Jürgen von Hagen, Claudia Keser</i>
B17-00	Rückführung der Landwirtschaftspolitik in die Verantwortung der Mitgliedsstaaten? - Rechts- und Verfassungsfragen des Gemeinschaftsrechts	<i>Martin Seidel</i>
B16-00	The European Central Bank: Independence and Accountability	<i>Christa Randzio-Plath, Tomasso Padoa-Schioppa</i>
B15-00	Regional Risk Sharing and Redistribution in the German Federation	<i>Jürgen von Hagen, Ralf Hepp</i>
B14-00	Sources of Real Exchange Rate Fluctuations in Transition Economies: The Case of Poland and Hungary	<i>Selahattin Dibooglu, Ali M. Kutan</i>
B13-00	Back to the Future: The Growth Prospects of Transition Economies Reconsidered	<i>Nauro F. Campos</i>

B12-00	Rechtsetzung und Rechtsangleichung als Folge der Einheitlichen Europäischen Währung	<i>Martin Seidel</i>
B11-00	A Dynamic Approach to Inflation Targeting in Transition Economies	<i>Lucjan T. Orlowski</i>
B10-00	The Importance of Domestic Political Institutions: Why and How Belgium Qualified for EMU	<i>Marc Hallerberg</i>
B09-00	Rational Institutions Yield Hysteresis	<i>Rafael Di Tella, Robert MacCulloch</i>
B08-00	The Effectiveness of Self-Protection Policies for Safeguarding Emerging Market Economies from Crises	<i>Kenneth Kletzer</i>
B07-00	Financial Supervision and Policy Coordination in The EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B06-00	The Demand for Money in Austria	<i>Bernd Hayo</i>
B05-00	Liberalization, Democracy and Economic Performance during Transition	<i>Jan Fidrmuc</i>
B04-00	A New Political Culture in The EU - Democratic Accountability of the ECB	<i>Christa Randzio-Plath</i>
B03-00	Integration, Disintegration and Trade in Europe: Evolution of Trade Relations during the 1990's	<i>Jarko Fidrmuc, Jan Fidrmuc</i>
B02-00	Inflation Bias and Productivity Shocks in Transition Economies: The Case of the Czech Republic	<i>Josef C. Brada, Arthur E. King, Ali M. Kutan</i>
B01-00	Monetary Union and Fiscal Federalism	<i>Kenneth Kletzer, Jürgen von Hagen</i>
1999		
B26-99	Skills, Labour Costs, and Vertically Differentiated Industries: A General Equilibrium Analysis	<i>Stefan Lutz, Alessandro Turrini</i>
B25-99	Micro and Macro Determinants of Public Support for Market Reforms in Eastern Europe	<i>Bernd Hayo</i>
B24-99	What Makes a Revolution?	<i>Robert MacCulloch</i>
B23-99	Informal Family Insurance and the Design of the Welfare State	<i>Rafael Di Tella, Robert MacCulloch</i>
B22-99	Partisan Social Happiness	<i>Rafael Di Tella, Robert MacCulloch</i>
B21-99	The End of Moderate Inflation in Three Transition Economies?	<i>Josef C. Brada, Ali M. Kutan</i>
B20-99	Subnational Government Bailouts in Germany	<i>Helmut Seitz</i>
B19-99	The Evolution of Monetary Policy in Transition Economies	<i>Ali M. Kutan, Josef C. Brada</i>
B18-99	Why are Eastern Europe's Banks not failing when everybody else's are?	<i>Christian E. Weller, Bernard Morzuch</i>
B17-99	Stability of Monetary Unions: Lessons from the Break-Up of Czechoslovakia	<i>Jan Fidrmuc, Julius Horvath and Jarko Fidrmuc</i>
B16-99	Multinational Banks and Development Finance	<i>Christian E. Weller and Mark J. Scher</i>
B15-99	Financial Crises after Financial Liberalization: Exceptional Circumstances or Structural Weakness?	<i>Christian E. Weller</i>
B14-99	Industry Effects of Monetary Policy in Germany	<i>Bernd Hayo and Birgit Uhlenbrock</i>
B13-99	Financial Fragility or What Went Right and What Could Go Wrong in Central European Banking?	<i>Christian E. Weller and Jürgen von Hagen</i>
B12-99	Size Distortions of Tests of the Null Hypothesis of Stationarity: Evidence and Implications for Applied Work	<i>Mehmet Caner and Lutz Kilian</i>
B11-99	Financial Supervision and Policy Coordination in the EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B10-99	Financial Liberalization, Multinational Banks and Credit Supply: The Case of Poland	<i>Christian Weller</i>
B09-99	Monetary Policy, Parameter Uncertainty and Optimal Learning	<i>Volker Wieland</i>
B08-99	The Connection between more Multinational Banks and less Real Credit in Transition Economies	<i>Christian Weller</i>

B07-99	Comovement and Catch-up in Productivity across Sectors: Evidence from the OECD	<i>Christopher M. Cornwell and Jens-Uwe Wächter</i>
B06-99	Productivity Convergence and Economic Growth: A Frontier Production Function Approach	<i>Christopher M. Cornwell and Jens-Uwe Wächter</i>
B05-99	Tumbling Giant: Germany's Experience with the Maastricht Fiscal Criteria	<i>Jürgen von Hagen and Rolf Strauch</i>
B04-99	The Finance-Investment Link in a Transition Economy: Evidence for Poland from Panel Data	<i>Christian Weller</i>
B03-99	The Macroeconomics of Happiness	<i>Rafael Di Tella, Robert McCulloch and Andrew J. Oswald</i>
B02-99	The Consequences of Labour Market Flexibility: Panel Evidence Based on Survey Data	<i>Rafael Di Tella and Robert McCulloch</i>
B01-99	The Excess Volatility of Foreign Exchange Rates: Statistical Puzzle or Theoretical Artifact?	<i>Robert B.H. Hauswald</i>
1998		
B16-98	Labour Market + Tax Policy in the EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B15-98	Can Taxing Foreign Competition Harm the Domestic Industry?	<i>Stefan Lutz</i>
B14-98	Free Trade and Arms Races: Some Thoughts Regarding EU-Russian Trade	<i>Rafael Reuveny and John Maxwell</i>
B13-98	Fiscal Policy and Intranational Risk-Sharing	<i>Jürgen von Hagen</i>
B12-98	Price Stability and Monetary Policy Effectiveness when Nominal Interest Rates are Bounded at Zero	<i>Athanasios Orphanides and Volker Wieland</i>
B11A-98	Die Bewertung der "dauerhaft tragbaren öffentlichen Finanzlage" der EU Mitgliedstaaten beim Übergang zur dritten Stufe der EWWU	<i>Rolf Strauch</i>
B11-98	Exchange Rate Regimes in the Transition Economies: Case Study of the Czech Republic: 1990-1997	<i>Julius Horvath and Jiri Jonas</i>
B10-98	Der Wettbewerb der Rechts- und politischen Systeme in der Europäischen Union	<i>Martin Seidel</i>
B09-98	U.S. Monetary Policy and Monetary Policy and the ESCB	<i>Robert L. Hetzel</i>
B08-98	Money-Output Granger Causality Revisited: An Empirical Analysis of EU Countries (überarbeitete Version zum Herunterladen)	<i>Bernd Hayo</i>
B07-98	Designing Voluntary Environmental Agreements in Europe: Some Lessons from the U.S. EPA's 33/50 Program	<i>John W. Maxwell</i>
B06-98	Monetary Union, Asymmetric Productivity Shocks and Fiscal Insurance: an Analytical Discussion of Welfare Issues	<i>Kenneth Kletzer</i>
B05-98	Estimating a European Demand for Money (überarbeitete Version zum Herunterladen)	<i>Bernd Hayo</i>
B04-98	The EMU's Exchange Rate Policy	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B03-98	Central Bank Policy in a More Perfect Financial System	<i>Jürgen von Hagen / Ingo Fender</i>
B02-98	Trade with Low-Wage Countries and Wage Inequality	<i>Jaleel Ahmad</i>
B01-98	Budgeting Institutions for Aggregate Fiscal Discipline	<i>Jürgen von Hagen</i>
1997		
B04-97	Macroeconomic Stabilization with a Common Currency: Does European Monetary Unification Create a Need for Fiscal Insurance or Federalism?	<i>Kenneth Kletzer</i>
B-03-97	Liberalising European Markets for Energy and Telecommunications: Some Lessons from the US Electric Utility Industry	<i>Tom Lyon / John Mayo</i>
B02-97	Employment and EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B01-97	A Stability Pact for Europe	<i>(a Forum organized by ZEI)</i>

ISSN 1436 - 6053

Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn

Walter-Flex-Strasse 3
D-53113 Bonn
Germany

Tel.: +49-228-73-1732
Fax: +49-228-73-1809
www.zei.de