

Der Open-Access-Publikationsserver der ZBW – Leibniz-Informationzentrum Wirtschaft
The Open Access Publication Server of the ZBW – Leibniz Information Centre for Economics

Hayo, Bernd; Hofmann, Boris

Working Paper

Monetary policy reaction functions: ECB versus Bundesbank

ZEI working paper, No. B 24-2003

Provided in cooperation with:

Rheinische Friedrich-Wilhelms-Universität Bonn

Suggested citation: Hayo, Bernd; Hofmann, Boris (2003) : Monetary policy reaction functions:
ECB versus Bundesbank, ZEI working paper, No. B 24-2003, <http://hdl.handle.net/10419/39487>

Nutzungsbedingungen:

Die ZBW räumt Ihnen als Nutzerin/Nutzer das unentgeltliche, räumlich unbeschränkte und zeitlich auf die Dauer des Schutzrechts beschränkte einfache Recht ein, das ausgewählte Werk im Rahmen der unter

→ <http://www.econstor.eu/dspace/Nutzungsbedingungen>
nachzulesenden vollständigen Nutzungsbedingungen zu vervielfältigen, mit denen die Nutzerin/der Nutzer sich durch die erste Nutzung einverstanden erklärt.

Terms of use:

The ZBW grants you, the user, the non-exclusive right to use the selected work free of charge, territorially unrestricted and within the time limit of the term of the property rights according to the terms specified at

→ <http://www.econstor.eu/dspace/Nutzungsbedingungen>
By the first use of the selected work the user agrees and declares to comply with these terms of use.

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



Bernd Hayo, Boris Hofmann

**Monetary Policy Reaction
Functions: ECB versus
Bundesbank**

Working Paper

**B 24
2003**

Monetary Policy Reaction Functions: ECB versus Bundesbank

Bernd Hayo* (University of Bonn and University of Duisburg-Essen)

and

Boris Hofmann** (University of Bonn)

Abstract

We estimate monetary policy reaction functions for the Bundesbank (1979:4-1998:12) and the European Central Bank (1999:1-2003:7). The Bundesbank regime can be characterised, both before and after German reunification, by an inflation weight of 1.2 and an output weight of 0.4. The estimates for the ECB are 1.2, and 1, respectively. Thus, the ECB, while reacting similarly to expected inflation, puts significantly more weight on stabilising the business cycle than the Bundesbank did.

JEL: E5

Keywords: Taylor rule, monetary policy, ECB, Bundesbank

Correspondence:

* *Corresponding author:* Department of Economics (FB 5), University of Duisburg-Essen, D-45117 Essen, Germany.
Phone: +49-(0)201-183-3010 Fax: +49-(0)201-183-3974
Email: bhayo@vwl.uni-essen.de

** ZEI, University of Bonn, Walter-Flex-Str. 3, D-53113 Bonn, Germany.
Phone: +49-(0)228-73-1732 Fax: +49-(0)228-73-1809
Email: bhofmann@uni-bonn.de

Thanks to Jürgen von Hagen for helpful comments. The usual disclaimer applies.

1. Introduction

In recent years, virtually all central banks in the industrialised countries have conducted monetary policy through market-orientated instruments designed to influence short-term interest rates (Borio 1997). Interest rate setting is commonly described in terms of the reaction to deviations of inflation and output from their targets (Taylor 1993). Gerlach and Schnabel (2000) estimate a Taylor rule for the euro area for the period 1990-1998 using synthetic euro area data¹. They find that monetary policy can be well explained in terms of such a Taylor rule. Now that almost five years have passed since the start of EMU, enough observations have become available to perform a first assessment of the ECB's conduct of monetary policy using an empirically estimated Taylor rule.

The ECB was explicitly designed after the German Bundesbank in the Treaty of Maastricht. One may conjecture that if two institutions are based upon similar design features, in particular central bank independence and a policy focus on price stability, their interest rate setting rules may look alike, although the challenges facing the ECB may be different to those facing the Bundesbank in the past. In addition, formulating monetary policy as a compromise between the representatives of various countries could also result in a different interest rate behaviour. Thus, it will be interesting to compare estimated Taylor rules for the Bundesbank (see Clarida et al. 1998 and Bundesbank 1999) and the ECB.

Based on these considerations, the present paper estimates Taylor rules for both the ECB and the Bundesbank. For Germany, we use monthly data from the formation of the EMS onwards (1979:4 – 1998:12), explicitly taking into account the period after German unification (1990:8 – 1998:12). For the ECB, data from 1999:1 to 2003:7 is employed. It is then tested whether the ECB is behaving similarly to the Bundesbank with respect to interest rate setting.

2. Econometric Methodology

In the estimations of the Taylor rules, we follow Clarida et al. (1998).² Short-term nominal interest rates are modelled as a function of deviations of output from its trend and of inflation from its (constant) target. We assume that the central banks are forward looking and react to the expected one-year ahead inflation rate and the current output gap.³ Finally, we allow for

¹ Other studies estimating Taylor rules for the euro area based on synthetic euro area data are Mihov (2001), Doménech et al. (2002), Clausen and Hayo (2002), and Gerdesmeier and Roffia (2003).

² The utilised data are: Interest rate: Day-to-day rate, Output: Industrial production, Inflation: CPI growth rate. Data sources are IFS for Germany and the ECB web site. The output gap has been constructed using a Hodrick-Prescott filter. The typical endpoint problem of the filter is not an issue here, as both in the Bundesbank and in the EMU estimation we have at least 10 months of output gap data that do not enter the estimation process.

³ Note that the output gap of the current period is not exactly known at the time of monetary policy decision making.

interest rate smoothing by including a lagged interest rate term in the Taylor rule specification⁴. Given these considerations, we estimate the following Taylor rule:

$$(1) \quad r_t = \rho r_{t-1} + (1-\rho) \alpha + (1-\rho) \beta \pi_{t+12} + (1-\rho) \gamma y_t + \varepsilon_t,$$

with: r = nominal short-term interest rate, π = inflation rate, y = output gap, ρ = degree of interest rates smoothing, α = long-term equilibrium of nominal interest rate, β = inflation weight, γ = output weight, ε = error term.

A major problem when working with forward-looking and current variables is that they may be correlated with the error term, leading to biased estimates of the coefficients of interest. Therefore, these variables must be instrumented. In addition, the error term may experience non-normality, autocorrelation and heteroscedasticity, causing problems with respect to statistical inference. It is now common to use the General Method of Moments (GMM) estimator, as it accounts for endogeneity biases as well as non-spherical errors. The GMM estimator possesses excellent asymptotic properties, but may perform poorly in small samples (see the special issue of the *Journal of Economics and Business Statistics* 1996). Traditional instrumental variable estimators, which are special cases of the GMM estimator (Hayashi 2000), are more efficient, provided the necessary restrictions are fulfilled. In small samples, efficiency is of particular importance, and it therefore appears to be advisable to rely on a traditional instrumental variable estimator whenever possible.

Another general estimation problem is the choice of instruments. In time-series econometrics, it is easy to find instruments that fulfil the orthogonality conditions between regressors and error term. Typically, this assumption is tested using a test of the validity of over-identifying restrictions when there are more instruments than estimated coefficients (see Davidson and McKinnon 1993).

The use of weak instruments, i.e. instruments that do not contribute much to explaining the instrumented variable, can lead to substantial biases in both estimators and test statistics even in large samples (see, e.g., Hahn and Hausman 2003, Stock et al. 2002). Stock and Yogo (2003) propose a test of weak instruments based on the F-test value of the first stage regression in a two-stage least squares procedure. This test does not, however, solve the question of how to choose *specific* instruments, for example, which lags of a variable.

We address the instrument selection problem by adopting a recently developed automatic model selection algorithm called GETS (see Hendry and Krolzig 1999). GETS starts from a

⁴Recent evidence shows that the explicit modelling of a lagged interest rate term is preferable to an autoregressive errors specification (Castelnuovo 2003).

general model and removes redundant instruments. While doing so, it searches all possible paths of the testing-down process and reports the most parsimonious model that does not violate a reduction test. Thus, the strongest instruments will be selected from a given choice of variables and their lags. This does not remove all arbitrariness, as, for instance, the researcher still needs to choose the potential instrumental variables and their maximum lag length, but it appears to be superior to the ad hoc methods typically employed in empirical research.

3. Empirical Estimation

Starting with the *Bundesbank*, instruments are being selected using the GETS reduction algorithm at a nominal 5% significance level based on a general model containing six lags of the potential instruments.⁵ The Stock and Yogo (2003) test shows no indication of problems with regard to biases in the estimators. It is possible to reject the null hypothesis that the nominally sized test statistics at 5% significance level exceed an actual level of 15%. In contrast, there is evidence that the Clarida et al (1998) specification suffers from problems with weak instruments.⁶

Employing these instruments in traditional instrumental variable estimation leads to residuals that exhibit severe problems of non-normality, autocorrelation and heteroscedasticity. Since at least the non-normality problems are not easily corrected, we choose GMM as the appropriate estimation technique. An important event in recent German history is unification, with German Monetary Union (GMU) taking place on 1 July 1990. We split our sample at that date to see whether it has a noticeable impact on the German reaction function (see Table 1).⁷ A comparison of the two columns referring to the Bundesbank shows that the estimates are similar. The lagged interest rate has exactly the same coefficient and the inflation coefficients are very close. Some differences occur for the output gap coefficient, which are not statistically significant when taking into account estimation uncertainty surrounding both coefficients ($F(1, 231) = 1.89$).

Comparing these value to the ones Clarida et al. (1998) obtained for the period 1979:4 to 1993:12 shows only slight differences ($\beta = 1.31, \gamma = 0.25$). However, estimating the Clarida et

⁵ The resulting instrument set is: interest rate (lags: 1, 2, 3), inflation (lag: 6), growth rate of the effective real exchange rate (lags: 1, 4), output gap (lags: 1, 2, 3, 6), the growth rate of the oil price index in DM (lags: 1, 6), and the monthly growth rate of the money aggregate M3 (lag: 2).

⁶ In their basic specification, Clarida et al. (1998) use 48 instruments (p. 1045, Table 1). In the first-stage regression for the inflation rate the Stock and Yogo-test can barely reject the hypothesis of a bias of 10% of the OLS bias and cannot reject the Null that the nominally sized test statistics of a 5% level does not exceed a level of 15%.

⁷ One could estimate a Taylor rule from 1979:4 to 2003:7 using German data and then test for a break in 1999:1. This would not take into account, however, that the ECB uses aggregate European variables in its rule.

al. baseline model for the post-GMU period gives a coefficient of 0.74 for the inflation weight and 0.48 for the output gap. The drop of the coefficient on inflation below unity may be one indication of the weak instrument problem in their specification. As round summary values for the Bundesbank covering both periods, we propose a weight on inflation of 1.2 and an output weight of 0.4. These restrictions cannot be rejected using either pre- or post German Monetary Union data.⁸

Table 1: Estimates of reaction functions for the Bundesbank and the ECB

Variables	Bundesbank 79:4-90:6	Bundesbank 90:8-98:12	ECB 99:1-02:7
Interest rate _{t-1} (ρ)	0.92** (0.018)	0.92** (0.015)	0.86** (0.033)
Inflation _{t+12} (β)	1.21** (0.244)	1.25** (0.162)	1.12* (0.505)
Output gap _t (γ)	0.43** (0.137)	0.32** (0.045)	1.03** (0.194)
Constant (α)	3.64** (0.670)	2.56** (0.353)	1.38 (1.132)
No. of Observations	135	101	43
σ	0.372	0.154	0.157
R ²	0.976	0.996	0.966
Over-identifying restrictions test	Chi ² (13) = 8.53	Chi ² (13) = 8.25	Chi ² (25) = 31.2

Notes: * (**) indicates significance at a 5% (1%) level. Bundesbank estimates based on GMM. ECB estimates based on a traditional instrumental variable method. Standard errors for coefficient estimates are computed using the procedure by Newey and West (1987). The R² is based on the short-run dynamic model. Diagnostic tests for the instrumental variable estimation of the ECB reaction function: Jarque-Bera normality test: Chi²(2) = 0.65, LM autocorrelation test: Chi²(2) = 2.35, ARCH test: Chi²(1) = 0.68, White-heteroscedasticity test with cross-products: Chi²(9) = 20.3**, RESET(1) test: F(1, 37) = 1.11.

For the *ECB reaction function*, the data are from January 1999 to July 2003.⁹ Again we select instruments based on the GETS algorithm.¹⁰ Applying the Stock and Yogo (2003) test, we can reject the hypotheses that the biases in the estimators are larger than 10% and that the nominally sized test statistics at 5% exceed an actual level of 25%. This time we find there are

⁸ Test results for the pre-GMU period: inflation coefficient against 1.2: F(1, 131) = 0.002, output coefficient against 0.4: F(1, 131) = 0.05, and joint: F(2, 131) = 0.03. Post-GMU period: inflation coefficient against 1.2: F(1, 97) = 0.09, output coefficient against 0.4: F(1, 97) = 2.88, and joint: F(2, 97) = 2.42.

⁹ Given that we employ a one-year ahead inflation rate, the actual estimation period ends in July 2002.

¹⁰ The resulting instrument set is: interest rate (lags: 1,2,4,6), inflation (lag: 1,3,5), growth rate of the effective real exchange rate (lags: 1,2,3,4,6), output gap (lags: 1,2,3,4,5,6), the growth rate of the oil price index in EUR (lags: 1,2,3,4,5), and the monthly growth rate of the money aggregate M3MA (lag: 2,3,4).

few problems with employing traditional instrumental variable techniques.¹¹ In the notes below Table 1, a battery of diagnostic tests are listed that show no problems except for evidence of heteroscedasticity. To avoid invalid inference, we employ, as in our estimates for Germany, robust standard errors.¹²

Regarding the actual estimates, we first note that the inflation coefficient is above unity. Second, it is quite close to the estimates we obtained for the Bundesbank. Statistically testing the ECB coefficient on inflation against 1.2, we cannot reject the hypothesis of equality ($F(1,39) = 0.03$). On the other hand, the output weight estimated for the ECB is more than twice as large as the one found for the Bundesbank. Testing the ECB coefficient against 0.4 leads to a rejection of the hypothesis of equal size ($F(1,39) = 10.5^{**}$).¹³ This test does not take into account that there is uncertainty in the estimation of the German coefficient. Taking this uncertainty into account still leads to the conclusion that the ECB output coefficient is significantly larger than the one for the Bundesbank.¹⁴

Conclusion

We estimate reaction functions for both the Bundesbank (1979:4 – 1998:12) and the European Central Bank (1999:1 – 2003:7) following the specification suggested by Clarida et al. (1998). We find that the Bundesbank reaction function can be characterised by an inflation weight of 1.2 and an output gap weight of 0.4 before and after German reunification. For the ECB we obtain a similar estimate of the inflation rate, and a unit coefficient on the output response, which is significantly higher. Thus, while the ECB reacts similar to the Bundesbank when it comes to inflation deviations, it shows a much stronger response to output deviations.

Given the similar institutional design, a stronger response of the ECB to the output gap may reflect different preferences of the ECB compared to the Bundesbank or the new economic and political environment the ECB operates in.¹⁵ Of course, whether these differences are temporary or permanent remains to be seen.

¹¹ There is an outlier in September 2001, the time of the terrorist attack on New York, which we include in the list of instruments. Including the dummy in the reaction function itself leaves the other estimators almost unchanged.

¹² Normal standard errors are: ρ (0.038), β (0.730), γ (0.232), and α (1.62).

¹³ Eliminating the constant from the ECB equation raises the coefficient on inflation to 1.7 and makes it significant at a 1% level, while the output gap coefficient remains basically unchanged. However, from the point of view of both economic theory and history, it is implausible to have a zero long-run nominal interest rate.

¹⁴ Testing the ECB output coefficient against the pre-GMU coefficient leads to a t-test value of 2.53. This is significant at the 5% level when performing a two-sided test and significant at a 1% level for a one-sided test. Against the post-GMU coefficient the value of the t-test is 3.57, which is significant at a 1% level.

¹⁵ The coefficients in the Taylor rule depend upon policy preferences, economic structure, and shocks. In general it is impossible to identify the policy preferences from the estimated parameters of the reaction function. Cecchetti and Ehrmann (1999) discuss how to recover policy preferences from Taylor rule estimates under very restrictive assumptions.

References

- Clarida, R., J. Gali, and M. Gertler (1998), Monetary policy rules in practice, *European Economic Review* 42, 1033-1067.
- Borio, C.E.V. (1997), The implementation of monetary policy in industrial countries: A survey, *BIS Economic Papers* No. 47, July.
- Castelnuovo, E. (2003), Taylor rules, omitted variables, and interest rate smoothing in the US, *Economics Letters* 81, 55-59.
- Cecchetti, S. G. and M. Ehrmann (1999), Does Inflation Targeting Increase Output Volatility, *NBER Working Paper* No. 7426, December.
- Clausen, V. and B. Hayo (2002), Monetary policy in the euro area – Lessons from the first years, *ZEI Working Paper* No 02/09, University of Bonn.
- Davidson, R. and J.G. MacKinnon (1993), *Estimation and Inference in Econometrics*, New York: Oxford University Press.
- Deutsche Bundesbank (1999), Taylor interest rate and monetary conditions index, *Monthly Report*, April, 47-63.
- Doménech, R., M. Ledo, and D. Taguas (2002), Some new results on interest rate rules in EMU and in the US, *Journal of Economics and Business* 54, 431-446.
- Gerdesmeier, D. and B. Roffia (2003), Empirical estimates of reaction functions for the euro area, *ECB Working Paper No 206*, European Central Bank.
- Gerlach, S. and G. Schnabel (2000), The Taylor rule and interest rates in the EMU area, *Economics Letters* 67, 165-171.
- Hahn, J. and J. Hausman (2003), Weak instruments: diagnosis and cures in empirical econometrics, *American Economic Review* 93, 118-125.
- Hayashi, F. (2000), *Econometrics*, Princeton: Princeton University Press.
- Hendry, D.F. and H.-M. Krolzig (1999), Improving on ‘Data mining reconsidered’ by K.D. Hoover and S.J. Perez, *Econometrics Journal* 2, 202-219.
- Mihov, I. (2001), Monetary policy implementation and transmission in the European Monetary Union, *Economic Policy* 16, 369-406.
- Newey, W.K. and K.D. West (1987), A simple, positive semi-definite, heteroscedasticity and autocorrelation consistent covariance matrix, *Econometrica* 55, 703-708.
- Stock, J.H. and M. Yogo (2003), Testing for weak instruments in linear IV regression, *mimeo*, Department of Economics, Harvard University.
- Stock, J.H., J.H. Wright, and M. Yogo (2002), A survey of weak instruments and weak identification in generalized method of moments, *Journal of Business & Economic Statistics* 20, 518-529.

Taylor, J. (1993), Discretion versus Policy Rules in Practice, *Carnegie-Rochester Conference Series on Public Policy* 39, 195-214.

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 Martinicus, 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 Reinthaler, 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>Sübidey 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>Ayse 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. Orłowski</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	FICs 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. Orłowski</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 Lender of Last Resort - 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. Orłowski</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 Wahrung	<i>Martin Seidel</i>
B11-00	A Dynamic Approach to Inflation Targeting in Transition Economies	<i>Lucjan T. Orłowski</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-Franzosisches 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, Jurgen 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 Jurgen 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-Franzosisches 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** *Christopher M. Cornwell and Jens-Uwe Wächter*
- B06-99 **Productivity Convergence and Economic Growth: A Frontier Production Function Approach** *Christopher M. Cornwell and Jens-Uwe Wächter*
- B05-99 **Tumbling Giant: Germany's Experience with the Maastricht Fiscal Criteria** *Jürgen von Hagen and Rolf Strauch*
- B04-99 **The Finance-Investment Link in a Transition Economy: Evidence for Poland from Panel Data** *Christian Weller*
- B03-99 **The Macroeconomics of Happiness** *Rafael Di Tella, Robert McCulloch and Andrew J. Oswald*
- B02-99 **The Consequences of Labour Market Flexibility: Panel Evidence Based on Survey Data** *Rafael Di Tella and Robert McCulloch*
- B01-99 **The Excess Volatility of Foreign Exchange Rates: Statistical Puzzle or Theoretical Artifact?** *Robert B.H. Hauswald*
- 1998**
- B16-98 **Labour Market + Tax Policy in the EMU** *Deutsch-Französisches Wirtschaftspolitisches Forum*
- B15-98 **Can Taxing Foreign Competition Harm the Domestic Industry?** *Stefan Lutz*
- B14-98 **Free Trade and Arms Races: Some Thoughts Regarding EU-Russian Trade** *Rafael Reuveny and John Maxwell*
- B13-98 **Fiscal Policy and Intranational Risk-Sharing** *Jürgen von Hagen*
- B12-98 **Price Stability and Monetary Policy Effectiveness when Nominal Interest Rates are Bounded at Zero** *Athanasios Orphanides and Volker Wieland*
- B11A-98 **Die Bewertung der "dauerhaft tragbaren öffentlichen Finanzlage" der EU Mitgliedstaaten beim Übergang zur dritten Stufe der EWWU** *Rolf Strauch*
- B11-98 **Exchange Rate Regimes in the Transition Economies: Case Study of the Czech Republic: 1990-1997** *Julius Horvath and Jiri Jonas*
- B10-98 **Der Wettbewerb der Rechts- und politischen Systeme in der Europäischen Union** *Martin Seidel*
- B09-98 **U.S. Monetary Policy and Monetary Policy and the ESCB** *Robert L. Hetzel*
- B08-98 **Money-Output Granger Causality Revisited: An Empirical Analysis of EU Countries (überarbeitete Version zum Herunterladen)** *Bernd Hayo*
- B07-98 **Designing Voluntary Environmental Agreements in Europe: Some Lessons from the U.S. EPA's 33/50 Program** *John W. Maxwell*
- B06-98 **Monetary Union, Asymmetric Productivity Shocks and Fiscal Insurance: an Analytical Discussion of Welfare Issues** *Kenneth Kletzer*
- B05-98 **Estimating a European Demand for Money (überarbeitete Version zum Herunterladen)** *Bernd Hayo*
- B04-98 **The EMU's Exchange Rate Policy** *Deutsch-Französisches Wirtschaftspolitisches Forum*
- B03-98 **Central Bank Policy in a More Perfect Financial System** *Jürgen von Hagen / Ingo Fender*
- B02-98 **Trade with Low-Wage Countries and Wage Inequality** *Jaleel Ahmad*
- B01-98 **Budgeting Institutions for Aggregate Fiscal Discipline** *Jürgen von Hagen*
- 1997**
- B04-97 **Macroeconomic Stabilization with a Common Currency: Does European Monetary Unification Create a Need for Fiscal Insurance or Federalism?** *Kenneth Kletzer*
- B-03-97 **Liberalising European Markets for Energy and Telecommunications: Some Lessons from the US Electric Utility Industry** *Tom Lyon / John Mayo*
- B02-97 **Employment and EMU** *Deutsch-Französisches Wirtschaftspolitisches Forum*
- B01-97 **A Stability Pact for Europe** *(a Forum organized by ZEI)*

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