

von Hagen, Jürgen; Zhou, Jizhong

Working Paper

The choice of exchange rate regimes in developing countries: A multinomial panel analysis

ZEI Working Paper, No. B 32-2004

Provided in Cooperation with:

ZEI - Center for European Integration Studies, University of Bonn

Suggested Citation: von Hagen, Jürgen; Zhou, Jizhong (2004) : The choice of exchange rate regimes in developing countries: A multinomial panel analysis, ZEI Working Paper, No. B 32-2004, Rheinische Friedrich-Wilhelms-Universität Bonn, Zentrum für Europäische Integrationsforschung (ZEI), Bonn

This Version is available at:

<https://hdl.handle.net/10419/39565>

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



Jürgen von Hagen and
Jizhong Zhou

The Choice of Exchange Rate Regimes in Developing Countries: A Multinomial Panel Analysis

Working Paper

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.: +49-228-73-9218
Fax: +49-228-73-1809
<http://www.zei.de>

**B 32
2004**

The Choice of Exchange Rate Regimes in Developing Countries: A Multinomial Panel Analysis

Jürgen von Hagen^{*}

ZEI, University of Bonn, Indiana University, and CEPR

and

Jizhong Zhou^{**}

ZEI, University of Bonn, and Shanghai University of Finance and Economics

Abstract

This paper analyses the choices of exchange rate regimes in developing countries since 1980. Static and dynamic random-effects multinomial panel models are estimated using simulation-based techniques. Explanatory variables include OCA fundamentals, stabilization considerations, currency crises factors, and political and institutional features. The results reveal strong state dependence in regime choices.

Key Words: exchange rate regimes, developing country, multinomial logit model, static and dynamic panel, simulation

JEL Codes : F33, F41, C25

^{*} Corresponding author: Center for European Integration Studies (ZEI), Walter-Flex-Strasse 3, D-53113 Bonn, Germany. Tel: +49+228+739199. Fax: +49+228+731809. Email: vonhagen@uni-bonn.de

^{**} Center for European Integration Studies (ZEI), Walter-Flex-Strasse 3, D-53113 Bonn, Germany. Tel: +49+228+734928. Fax: +49+228+731809. Email: jzhou@uni-bonn.de

1. Introduction

The choice of exchange rate regimes has long been a controversial topic among academic economists and policy makers. For most developing countries, it is commonly regarded as their single most important macroeconomic policy decision, which strongly influences the making and efficacy of other macroeconomic policies and is a centrepiece of macroeconomic policy prescriptions given by institutions such as the International Monetary Fund (IMF) or the World Bank. The collapse of the Bretton Woods System in 1973 provided many countries with a far wider range of choices than before. While a few leading currencies in the industrial world moved toward freely floating exchange rate regimes, most countries continued to apply some kind of exchange rate pegs. Since the mid-1980s a trend toward more flexible regimes emerged, and the share of pegged regimes has declined. However, independently floating exchange rates comparable to those of major international currencies remain rare in the developing world. Instead, various types of intermediate arrangements were adopted to combine exchange rate stability with policy flexibility.

The variation in exchange rate regimes invoked research interests to the determination of these choices. Theoretical investigation on the topic can be traced back to the Optimum Currency Area (OCA) theory of the 1960s, where the exchange rate is primarily viewed as an expenditure-switching device for aggregate demand management in general and for balance-of-payments adjustment in particular. This literature develops a list of criteria for favouring fixed-rate regimes against flexible-rate regimes, including high factor mobility (Mundell, 1961), small economic size and high economic openness (McKinnon, 1963), and high production diversity (Kenen, 1969), since exchange rate adjustment is unnecessary or unable to switch expenditures if these criteria are fulfilled. The literature of the 1970s focused on the automatic-stabilizer property of exchange rates in response of nominal and real shocks

(Boyer, 1978; McKinnon, 1981). The main conclusion is that, in terms of output stabilization, fixed-rate regimes perform better if domestic nominal shocks dominate, while flexible-rate regimes are preferable if real shocks are the main source of disturbances. Since both types of shocks tend to coexist and may vary in relative importance, various types of managed floating regimes are recommended. Following the analysis of Barro and Gordon (1983) on the credibility of monetary policy, the literature in the 1980s discusses the possibility of using exchange rates as nominal anchor. Many authors advocate fixing the exchange rate against a low-inflation foreign currency to improve the anti-inflation credibility of the domestic monetary authority (Goldstein, 1980; Melitz, 1988; Fratianni and von Hagen, 1992).

Empirical research on exchange regime choices started in the late 1970s, when more diverse regime choices began to be observed. The early studies selected potential regime determinants based mainly on the OCA criteria (Heller, 1978; Dreyer, 1978), and those in the 1980s added variables to reflect types of shocks and stabilization strategies (Melvin, 1985; Savvides, 1990). Some authors also include institutional and political variables as potential regime determinants (Edwards, 1996; Bernhard and Leblang, 1999; Méon and Rizzo, 2002). A comprehensive approach covering a wide range of regime determinants is adopted by many recent studies (Rizzo, 1998; Poirson, 2001; Juhn and Mauro, 2002; von Hagen and Zhou, 2002a). As summarized in Table 1 for a sample of selected papers, the empirical results seem to be sensitive to the sample composition, data construction, and model specification.¹

¹ Many papers use various model specifications to analyse the choices of exchange rate regimes, for which Table 1 either reports the main results, which tend to be robust across specifications, or indicates the changing signs of the coefficients. Some papers use explanatory variables not very common in other studies, which are not included in the list of variables here. It should also be noted that some variables, especially real and nominal shocks, have different proxies in different studies. To ease comparisons across studies, Table 1 reports the qualitative impact of each variable on the probability of adopting a fixed or pegged exchange rate regime.

It is clear from Table 1 that many studies (ten out of fourteen under our review, denoted by “B” for regimes) use a simple binary structure to classify exchange rate regimes into either fixed or flexible ones, although the theoretical literature on optimal stabilization suggests that intermediate regimes between the two corner solutions are preferred in the presence of both real and nominal shocks. Seven studies include intermediate regimes as a separate option and use an ordered-choice classification (denoted by “O” for regimes), with the assumption that the degree of regime flexibility is monotone in the regime determinants. Only two studies use a multinomial choice structure (denoted by “M” for regimes), which is a general and flexible framework able to capture both the diversity in regime choices and the complexity in the response of regime choices to the changes in the determinants.

[Table 1 is about here.]

The main estimation methods are cross section and pooled panel analysis. In cross section analysis, exchange rate regime choices of a given year are typically explained by the average values of the independent variables over several previous years. Although it can dampen the effects of temporary disturbances in the regime determinants and attenuate endogeneity problems of these variables, this is less appropriate when substantial volatility is observed in the economic environment or the exchange rate regime itself undergoes frequent changes. Using past averages to explain current choices in such a constellation may result in misleading inferences on the role of some factors. In pooled panel analysis, country heterogeneity in unobserved factors as well as temporal correlation in the regime choices by the same country are ignored. This simplification overlooks the role of credibility and reputation for the desirability and sustainability of exchange rate pegs. In reality, state dependence is likely to play an important role in the choice of exchange rate regimes, since past experiences with a certain regime can influence its desirability and the probability of its being continued. Such a dynamic linkage requires either including lagged regime choices as

explanatory variables, or allowing for serial correlation in the error terms. However, due to technical difficulties in the estimation, especially the heavy computational burden of numerical integrations, panel discrete-choice models are rarely implemented for the explanation of exchange rate regime choices.

This paper aims at filling the blank by introducing a multinomial panel model for the analysis of exchange rate regime choices. We study regime choices in more than 100 developing countries, emerging market economies, and transition economies during the 1980s and the 1990s. The model allows three choices-fixed, intermediate, and flexible regimes-in a non-ordered way and can be easily extended to choice structures with more alternatives. The dynamic linkage among regime choices is modelled by including country-specific random effects to capture auto-correlation as well as lagged regime choices to account for state dependence. The technical difficulty involved in the numerical integrations is solved by adopting a simulation-based estimator (the GHK simulator, see discussion below).

The rest of the paper is organized as follows. Section 2 discusses the classification of exchange rate regimes as well as the potential regime determinants. Section 3 presents our multinomial panel model for exchange rate regime choices and sketch the estimation procedures. The estimation results are discussed in section 4, and section 5 concludes.

2. Exchange Rate Regimes: Choices and Determinants

2.1 The classification of exchange rate regimes

The classification of exchange rate regimes is a controversial task. The exchange rate regimes adopted by developing countries cover a wide range of alternatives, some of which do not fall neatly into the conventional fixed-or-flexible dichotomy. While the difference

between currency boards and freely floating regimes is obvious, that between adjustable pegs and managed floating regimes tends to be blurred, especially when the adjustment is frequent under the former or the management is tight under the latter. Therefore, whether a particular exchange regime should be classified as fixed or flexible is often debatable. To complicate the issue further, there is a general recognition nowadays that in many countries declared exchange rate regimes do not always correspond to the actual exchange rate policies. The discrepancies between *de jure* and *de facto* exchange rate regimes are well documented and have become a research topic in its own right.²

In this paper we focus on the official (*de jure*) exchange rate regimes, which countries declare as the regimes they find themselves in. Despite of the fact that a country may renege on the declared regime, the announcement itself reflects the view of the authority as to which exchange arrangement is the most appropriate for the country, and thus can influence market expectations about the behaviour of the exchange rate as well as of the monetary policy. Moreover, in order to understand why countries deviate from the chosen regimes one needs to understand how these choices are made in the first place. This is the aim of this paper.

Countries report their exchange arrangements to the International Monetary Fund (IMF), which publishes its regime classifications based on these reports in the *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)*. In the early years after the breakdown of the Bretton Woods System, the IMF classified all exchange arrangements under two broad rubrics: pegged regimes or more flexible regimes, with pegs to a single foreign currency, to the Special Drawing Rights (SDR), and to other composite currencies being finer categories under the former, and regimes with limited flexibility, with exchange-rate adjustments according to indicators, and with independently floating rates being sub-headings

² See Levy-Yeyati and Sturzenegger (2003), Calvo and Reinhart (2002), Reinhart and Rogoff (2003), von Hagen and Zhou (2002b).

under the latter. For the most part of the 1980s and the 1990s, the IMF identified eight exchange rate regimes based on official information (see the left column of Table 2). On January 1, 1999, the IMF switched to a new scheme to classify exchange rate regimes (see the right column of Table 2). The change reflects the IMF's efforts to keep its regime nomenclature a reasonably good labelling of actual exchange rate policies. The new classification system takes into account the actual behaviour of the exchange rate, but it is still heavily influenced by official declarations, and differs-in some cases substantially-from those regime classifications based purely on observed exchange rate movements (Levy-Yeyati and Sturzenegger, 2003; Reinhart and Rogoff, 2003). For this reason we still treat the new IMF classification as official regimes.³

[Table 2 is about here.]

Table 3 reports the evolution of exchange rate regimes in developing countries in the last quarter of the twentieth century. By “developing countries” we mean all the IMF member countries not classified as industrial countries. Emerging market economies and transition economies are included in our sample. Under the old IMF classification, the share of single-currency pegs and SDR pegs has been on the steady decline, from 69% in the late 1970s down to 29% in 1996-1997. The share of pegs to other composite currencies, in contrast, maintained its position at around 11%, although they seemed to be in favour in the late 1980s. Managed floating regimes have been rising in share since the late 1970s, and so did freely floating regimes since the early 1980s. The regimes with limited flexibility or rules-based adjustments form the smallest group and have been losing ground since the early 1980s. Under the new

³ There are attempts to use the new IMF scheme backwards to classify exchange rate regimes in earlier years.

Von Hagen and Zhou (2002a) apply it to a sample of 25 transition economies in the 1990s. Bubula and Ötker-Robe (2002) apply it to all the IMF member countries in the 1990s, but they call it a “de facto” classification.

IMF classification, the total share of managed and independently floating regimes is reduced, as some of them are reclassified into less flexible exchange rate regimes.⁴

[Table 3 is about here.]

For the multinomial analysis discussed below, we combine exchange arrangements to form three broad regimes. The basic classification treats exchange arrangements 1, 2, and 3 as fixed regimes, 4, 5, and 6 as intermediate regimes, and 7 and 8 as flexible regimes. We also use an alternative classification, with regimes 3 and 7 reclassified as intermediate ones, since these two regimes may bear more resemblance to intermediate regimes than to hard pegs or to freely floating regimes.

2.2 *The determinants of regime choices*

Based on theoretical suggestions and empirical findings we consider four groups of potential regime determinants: the OCA fundamentals, the stabilization considerations, the currency crises factors, and political and institutional features. The exact construction of the data and data sources are reported in the Appendix. For the OCA fundamentals, we include economic openness (OPEN, measured by the ratio of trade to GDP), geographical concentration of trade (GCON, measured by the share of the largest trading partner in total trade), economic size (SIZE, measured by GDP in logarithm), level of economic development (LEVEL, measured by per capita GDP in logarithm), and degree of financial development (FINDEV, measured by the ratio of broad money to GDP).

To reflect stabilization strategies, we consider three variables: inflation performance (CPINF, measured by the transformed consumer price inflation rates,⁵ $\pi/(1+\pi)$), relative price shocks (RERVOL, proxied by the volatility of rear effective exchange rates), and

⁴ This is consistent with the “fear of floating” phenomenon dubbed by Calvo and Reinhart (2002).

⁵ This is aimed at avoiding bias caused by some hyperinflationary episodes. See Ghosh et al. (1997).

domestic monetary shocks (NOMSHK, proxied by volatility of broad money growth rates). Some factors can influence the risks of currency crises and therefore the chances for some regimes being adopted. These factors include international reserves adequacy (RESERVE, measured by the ratio of non-gold reserves to broad money), public finance performance (FISCAL, measured by the ratio of government budget surpluses (+) or deficits (-) to GDP), and current account positions (CA, measured by the ratio of current account surpluses (+) or deficits (-) to GDP). Finally, political and institutional features are also found to be influencing regime choices, so we consider three variables in this regard: financial openness (KCONTR, the degree of capital controls, inversely related to financial openness), overall freedom of the society (FREEIDX, an index of political freedom and civil liberty), and political instability (POLINST, proxied by frequency of changes in political powers).

[Table 4 is about here.]

Table 4 reports the means and standard deviations of the regime determinants over the full sample. Means of each variable across three regime groups are also reported, and z-tests for the null hypothesis of equal means across regimes are conducted. A rough impression is that on average the three regimes are similar in some perspectives, e.g. trade concentration, real exchange rate volatility, or public finance, but differ significantly from each other on other dimensions, including economic sizes, financial openness, and freedom scores (see the two far-right columns of Table 4). Moreover, the mean values of most variables are not monotonically increasing or decreasing in the rising flexibility of regimes, suggesting that these variables have qualitatively different impacts on intermediate and flexible regimes, both relative to fixed ones. This implies that a non-ordered multinomial approach should be more appropriate than either binary or ordered choice structures. We also check correlations among the potential regime determinants (see Table 5). Since the highest correlation in absolute

values is 0.39, and most of the correlations are below 0.30, Table 5 does not indicate any serious multicollinearity.

[Table 5 is about here.]

3. A Multinomial Random Effects Panel Model

3.1 The model specifications

We use Y_{it} , $i = 1, 2, \dots, N$, $t = 0, 1, \dots, T_i$, to denote the exchange rate regime choice of country i in year t , with $Y_{it} = 0, 1, 2$ for fixed, intermediate, and flexible regimes, respectively.⁶ Countries choose their regimes based on the principle of utility maximization, which implies that

$$\Pr(Y_{it} = j) = \Pr(U_{ij} > U_{ik}), \quad j, k = 0, 1, 2, \quad k \neq j, \quad (1)$$

where U_{ij} denotes the unobserved utility that country i derives in year t from regime j . We assume that the random utility U_{ij} consists of a predetermined component V_{ij} , which is linear in a vector of explanatory variables \mathbf{x}_{it} , and a random error u_{ij} , which has an error component structure. More specifically,

$$U_{ij} = V_{ij} + u_{ij}, \quad (2a)$$

$$V_{ij} = \beta_j \mathbf{x}_{it}, \quad (2b)$$

$$u_{ij} = \alpha_{ij} + \varepsilon_{ij}, \quad (2c)$$

where β_j is a row vector of coefficients, α_{ij} reflects country-specific, regime-dependent, and time-invariant heterogeneity, and ε_{ij} is independently and identically distributed (i.i.d.)

⁶ Note that the panel is unbalanced as T_i varies across i .

across countries, years, and regimes. Because only the utility differences matter for regime choices, we normalize $U_{it0} \equiv 0$ for all i and t . Let $\alpha_i = (\alpha_{i1}, \alpha_{i2})'$ and assume that α_i has a bivariate normal distribution characterized by

$$\alpha_i \sim N(\mathbf{0}, \Sigma), \text{ with } \Sigma = \begin{pmatrix} \sigma_{11} & \sigma_{12} \\ \sigma_{21} & \sigma_{22} \end{pmatrix}. \quad (3)$$

This leads to the static version of the random effect panel model. For simplicity we assume that α_i is i.i.d. across countries and years. Note that despite of this simplification, the random error u_{ijt} is serially correlated due to the existence of α_{ij} , which provides one mechanism to account for the dynamic linkage in regime choices.

Another method to account for serial correlation is to assume that lagged regime choices enter the determination of current choices, which gives rise to state dependence in the decision-making process.⁷ Let $d_{ijt} = \mathbf{1}\{Y_{it} = j\}$ be the dummy for regime j , with $\mathbf{1}\{\cdot\}$ being an indicator function generating a value of unity if the statement in brackets is true, and define $\mathbf{d}_{it} = (d_{it1}, d_{it2})'$. Our specification of this dynamic model is

$$V_{ijt} = \gamma_j \mathbf{d}_{it-1} + \beta_j \mathbf{x}_{it}, \quad t > 0. \quad (4)$$

Note that we drop the dummy for fixed regimes (d_{it0}) to avoid multicollinearity in the regressors. This specification corresponds to a first-order Markov chain in regime transition, with the coefficient vector $\gamma_j = (\gamma_{j1}, \gamma_{j2})$ measuring the direct influence of lagged regime choices on the current decision, after controlling for the influence of other factors as well as of country heterogeneity. The initial regime choices at $t = 0$ are treated as non-stochastic

⁷ Heckman (1981a) defined spurious state dependence as that caused by unobservable common effects, while that due to past regime choices is true state dependence.

constants determined by pre-sample history, which substantially simplifies the likelihood function.⁸

3.2 Estimation procedure

In order to make the model operational, we assume that the distribution of the error term ε_{ijt} is i.i.d. Type I extreme value, resulting in a logit specification of the model. Let the probability for $Y_{it} = j$ conditional on V_{ijt} and α_i be denoted by $P_{ijt} | \alpha_i$. We have

$$P_{ijt} | \alpha_i = \Pr(Y_{it} = j | V_{it}, \alpha_i) = \frac{\exp(V_{ijt} + \alpha_{ij})}{\sum_{k=0}^2 \exp(V_{itk} + \alpha_{ik})}, \quad j = 0, 1, 2, \quad \forall i, \quad (5)$$

with $V_{it0} \equiv 0$ and $\alpha_{i0} \equiv 0$ for normalization. Equation (5) applies for all t if (2b) is used, and for $t > 0$ if (4) is used.

The probability for $Y_{it} = j$ conditional only on observed V_{ijt} is denoted by P_{ijt} , which can be obtained by integrating out α_i from $P_{ijt} | \alpha_i$. That is,

$$P_{ijt} = \int_{\alpha_i} (P_{ijt} | \alpha_i) f(\alpha_i) d\alpha_i, \quad (6)$$

with f denoting the density of α_i . It is clear from (6) that P_{ijt} is the expectation of $P_{ijt} | \alpha_i$ over the domain of α_i . In the following estimation P_{ijt} is approximated by a simulated mean of $P_{ijt} | \alpha_i$. The simulation is conducted using the GHK simulator.⁹ The basic approach is to draw random numbers α_i^r from the distribution (3), calculate $P_{ijt} | \alpha_i^r$ for each draw using (5),

⁸ A more complicated specification assumes that at the initial stage the data generating process is in equilibrium, so the probability for the initial choices is equal to the limiting marginal probability (Hsiao, 1986). An alternative specification is to model the initial probability as a reduced-form probability depending on all pre-sample exogenous explanatory variables (Heckman, 1981b).

⁹ The GHK simulator gets its name from the works by Geweke (1991), Hajivassiliou and McFadden (1998), and Keane (1994).

repeat the process for R times, and then take the average over R draws as an approximation of P_{ij} . In short,

$$P_{ij}^* = \frac{1}{R} \sum_{r=1}^R (P_{ij} | \alpha_j^r). \quad (7)$$

Then the simulated log-likelihood function for the whole sample is given by

$$\log L^* = \sum_i \sum_t \sum_k d_{ik} \log P_{ik}^*, \quad (8)$$

which will be maximized to obtain estimation of the parameters of interest.¹⁰

4 Results and Discussions

We estimate both static and dynamic versions of the random effects panel model. Each version is estimated using the basic and the alternative regime classification. For each specification we estimate the model four times, adding one group of variables at each time. The sample sizes vary across estimations, with the number of countries ranging from 94 to 128 and the number of observations from 1189 to 2230. The time span is usually 1981 to 1999, except when political and institutional variables are added in the fourth estimation, for which the time span ends at 1994 due to lack of data on POLINST afterwards. For each estimation we generally set the number of random draws of α_i^r at $R = 30$.¹¹ In order to reduce the endogeneity bias, all explanatory variables (except for the regime dummies) are lagged by one year. We also include dummies for each five-year interval since 1986, with 1981-1985 as

¹⁰ See Train (2002) for a detailed discussion on the estimation procedure.

¹¹ We also experiment with other values of R , e.g. 25 or 20, whose results are not very different from those reported here.

the omitted period.¹² Because we normalize the utility associated with fixed regimes to zero, the coefficients reported in Table 6 and Table 7 ($\beta_j, \gamma_j, j = 1, 2$) indicate the qualitative impacts on the utility associated with regime j relative to fixed regimes. Therefore, a positive (negative) coefficient means that an increase in the variable raises (reduces) the utility of regime j , and henceforth its probability of being adopted, relative to fixed regimes.

4.1 Results of the static model

Table 6a reports the results of the static model with the basic regime classification. It is clear from Table 6a that, from a static point of view, the OCA fundamentals play an important role in the determination of exchange rate regime choices, as most of them have significant coefficients in the estimations. The results suggest that countries more open to foreign trade are more likely to adopt flexible regimes, but less likely to choose intermediate ones. Moreover, the more geographically concentrated the foreign trade is, the more likely intermediate and flexible regimes are selected. This is consistent with the observation that developing countries are very concerned with their competitiveness in international markets, especially in their major trading partners, and countries prefer more flexible regimes since they can help avoid prolonged exchange rate misalignment.

[Table 6a is about here.]

Economic size and development level also influence regime choices in significant ways. In general, larger developing countries are less likely to peg, probably reflecting their reluctance to give up monetary autonomy. Richer developing countries favour intermediate regimes and will choose flexible regimes with the lowest probability. The positive association between LEVEL (per capita GDP) and intermediate regimes is mainly caused by the choice of

¹² We use period instead of annual dummies to increase degrees of freedom and to avoid convergence problems frequently encountered if annual dummies are used.

a handful of rich countries in the Gulf region and a few middle-income Latin American countries of intermediate regimes. A more general implication is that rich countries tend to have fixed regimes and poor countries ones have flexible regimes. One explanation is that rich countries have deeper and broader financial markets, which can help the nation to maintain stable exchange rates. This is consistent with negative coefficients for FINDEV, which imply that countries with more developed financial markets tend to favour fixed regimes over the other two options.

Among the stabilization variables, high inflation (CPINF) definitely raises the chances for intermediate and flexible regimes, and the higher the inflation rate, the more flexible the regimes will be. This is against the notion that countries use the exchange rate anchor to curb inflation, but consistent with the difficulties to keep exchange rates stable when inflation is rampant. As a proxy for real shocks, real exchange rate volatility (RERVOL) has-against our expectation-negative coefficients, indicating that countries tend choose fixed regimes in response to large real exchange rate variations. This is probably the case when exchange rate fluctuation is the main source of relative price movements, so fixing the nominal exchange rate eliminates one major source of real exchange rate variations.¹³ The proxy for nominal shocks (NOMSHK), in contrast, bears expected signs, pointing to the direction of fixed regimes when the size of domestic monetary shocks is large.

The variables reflecting currency crises risks seem to be more relevant for intermediate regimes than for flexible regimes, consistent with the views that intermediate regimes are more vulnerable to currency crises than either fixed or flexible ones. But the results are somewhat sensitive to the addition of political and institutional variables. When these variables bear significant coefficients, the signs suggest that sufficient foreign exchange

¹³ Another possibility, which hints on reverse causality, is that fixed regimes prevents inflation differentials from being absorbed by exchange rate movements, henceforth higher real exchange rate volatility.

reserves, large budget deficits (negative FISCAL), and current account surpluses make intermediate regimes more likely. The impacts of these variables for flexible regimes are-although less significant-qualitatively the same. While it is reasonable to associate public finance problems with increased risks of crises and, therefore, with lower probability for fixed regimes, it is a bit puzzling to see countries with large current account deficits choose fixed regimes instead of more flexible ones. It probably reflects a reverse causality: countries with more flexible exchange rates are more able to maintain external competitiveness and have fewer balance-of-payments problems.

The political and institutional variables seem to be less important than other variables. Intensive capital controls are more likely associated with intermediate regimes than with fixed or flexible regimes, but the results are not statistically significant. Countries with higher degree of political freedom and civil liberty have a preference for flexible regimes, which is significantly stronger than that for intermediate or fixed regimes. This is consistent with the findings of some empirical studies that countries with less democratic political regimes tend to adopt fixed exchange rate regimes.¹⁴ However, political instability seems to make both fixed and flexible regimes more likely relative to intermediate regimes, while the empirical literature usually finds that fixed regimes tend to be significantly less favoured than flexible regimes in case of political instability.

To check the robustness of these findings, Table 6b reports results based on the alternative regime classification. In general the results are similar to those reported above, showing that these findings are robust to alternative regime classifications. However, there are several interesting differences. First of all, geographical concentration (GCON) now works strongly against intermediate and flexible regimes. A closer look at the data shows that countries with pegs to some self-defined composite currencies (regime type 3) have on

¹⁴ See, for example, Méon and Rizzo (2002).

average very low values of GCON. When these composite currency pegs are reclassified from fixed regimes to intermediate ones, they pull down the average values of GCON for the intermediate group, and leave the fixed group consisting only of single currency pegs and SDR pegs, which tend to be associated with highly concentrated trade structure. As a result, based on the alternative regime classification, high degree of trade concentration makes fixed regimes more likely.

[Table 6b is about here.]

Moreover, the role of government budget deficits for regime choices seem to be sensitive to the inclusion of political and institutional variables. The changes in signs suggest that when political and institutional features are controlled for, countries have a tendency to use fixed regimes to help strengthen fiscal discipline, and this tendency is more obvious when the alternative regime classification is used. And the political and institutional variables themselves are also more important for regime choices under the alternative classification, as evidenced by more significant coefficients than before. In general the strong association between intermediate regimes and intensive capital controls is even more significant, and so is the case for the association between fixed regimes and low degree of overall freedom.

4.2 Results of the dynamic model

We now turn to the results of the dynamic model. The dummy for intermediate regimes in the previous year is LAGINT and that for flexible ones is LAGFLEX. It is clear from Table 7a that past regime choices enter significantly into the decision-making process for current regime choices, and the results are robust to the addition of explanatory variables. There is strong state dependence in regime choices: having a fixed regime in the previous year significantly reduces the probability of adopting other regimes in this year, and having an intermediate or a flexible regime previously makes it more likely to choose for the current

period either of these two regimes relative to fixed ones. Moreover, a comparison of the magnitudes of the relevant coefficients shows that being in an intermediate regime in the previous year raises the chance for the same regime this year by a larger margin than for flexible ones, and vice versa for flexible regimes. All these conform well with the fact that regime choices tend to be persistent and suggests that current regime choices depend crucially on past choices. Using Heckman (1981a)'s terminology, there exists "true" state dependence in the choice of exchange rate regimes, even after controlling for the existence of "spurious" state dependence due to unobserved common effects.

[Table 7a is about here.]

Some explanatory variables see their significance levels reduced in the dynamic model, reflecting the possibility that in the static model these variables also capture some part of the influence from lagged regime choices, and when these additional influences are controlled in the dynamic model, the impact of these variables tends to be weaker than before. The results are nevertheless similar to those of the static model in terms of the signs of the coefficients, suggesting that the qualitative implications derived above still hold. In general, countries more open to foreign trade, with more concentrated trade structures, or larger in economic sizes tend to have flexible regimes, while those with low income levels or less developed financial systems tend to have fixed regimes.

The stabilization variables still play significant roles in the determination of exchange rate regime choices, except for the proxy for nominal shocks (NOMSHK), which becomes insignificant in almost all cases but nevertheless still points to the direction that fixed regimes will be preferred when nominal shocks are substantial. As before, high inflation makes fixed regimes less tenable and, as a result, less attractive, while large real exchange rate volatility, in contrast, makes them more preferable. The variables related to currency crises risks and those reflecting political and institutional features appear to be playing only a limited role in

the determination of regime choices, as most of them are insignificant in the dynamic framework.

As a robustness check we estimate the dynamic model using the alternative regime classification (see Table 7b). The results are not sensitive to the reclassification of some controversial exchange arrangements. In general the coefficients reported in Table 7b are comparable to those listed in Table 7a, and the significance levels are either unchanged or slightly higher than in previous estimations.

[Table 7b is about here.]

The explanatory power of the dynamic model is much higher than that of the static model, thanks to the persistence in regime choices. Based on the estimates of the static model, the share of correctly explained regime choices ranges from 57% to 74%. Based on the results of the dynamic model, in contrast, the ratio of right prediction is above 90%. Moreover, the sizes of the estimated variance and covariance of country-specific random effects $(\sigma_{11}, \sigma_{12}, \sigma_{22})$ are usually smaller in the dynamic model than in the static one. This is because in the static model the α_i terms capture not only the influence of unobserved country heterogeneity, but also part of the influence of true state dependence. In the dynamic model, the latter part of variance is captured by lagged regime dummies, so the estimated variance-covariance of α_i tends to be reduced accordingly. However, in general the variance and covariance of country-specific random effects are fairly small. Since the α_i terms capture country heterogeneity caused by all the potential regime determinants excluded from the model, small variance and covariance may be consistent with the view that, after including so many regime determinants, the problem of omitted variables as well as of country heterogeneity is finally not so important.

5 Conclusions

In this paper we apply simulation-based estimation techniques to the analysis of the choices of exchange rate regimes in developing countries since the fall of the Bretton Woods System. We expand the conventional fixed-vs.-flexible dichotomy into a trichotomous choice structure, with fixed, intermediate, and flexible regimes as three options. We use a non-ordered multinomial framework to allow the possibility that the influence of some variables on regime choices are not monotonically increasing or decreasing in the underlying regime flexibility. Moreover, we model the persistence in the regime choices of the same country by including country-specific time-invariant heterogeneity, or by including past regime choices in the decision on the current ones. We construct a random-effects multinomial panel model for the choices of exchange rate regimes and estimate the model using the GHK simulator.

We consider a wide range of potential regime determinants, including the OCA fundamentals, stabilization strategies, currency crises risks, and political and institutional features. In general, all these variables have more or less explanatory power for the determination of regime choices, but tend to be less significant in the dynamic model than in the static one. The regime persistence is well explained by lagged regime dummies, indicating that it is largely due to significant “true” state dependence in the decision process.

Appendix: Definition of Variables and Data Sources

We construct the variables from various sources. Five variables (CA, FISCAL, NOMSHK, OPEN, and RERVOL) are either directly taken from the CD-ROM attached to

Ghosh et al. (2002), or constructed based on the data from this source. The detailed information on data construction and sources are as follows:

CA: Current account balance, normalized by GDP. Data source is the IMF, *World Economic Outlook Database*.

CPINF: Transformed consumer price inflation rates (π^*). The transformation uses the formula $\pi^* = \pi / (1 + \pi)$, with π denoting the raw data series. Data source is the IMF, *World Economic Outlook Database*.

FINDEV: Broad money, normalized by GDP. Broad money is the sum of “money” and “quasi-money”. Data source is the IMF, *International Financial Statistics*.

FISCAL: Central government budget balance, normalized by GDP. Data source is the IMF, *World Economic Outlook Database*.

FREEIDX: Index of political freedom and civil liberty. The index is constructed by first averaging the scores of political rights and of civil liberties (each on a 1-7 scale) obtained from the Freedom House, and then subtracting the average scores from 8. The index is again on a 1-7 scale but with higher values representing higher degrees of freedom.

GCON: Share of trade with the largest trading partner in the total trade with the ten largest trading partners. Data source is the IMF, *Direction of Trade Statistics*.

KCONTR: Intensity of capital controls, defined as the sum of the dummies for (1) the existence of multiple or dual exchange rates, (2) the existence of restrictions on payments of current transactions, (3) the existence of restrictions on payments of capital transactions, and (4) the existence of surrender requirements for export proceeds. Data source is the IMF, *Annual Report on Exchange Arrangements and Exchange Restrictions*.

LEVEL: Per capita GDP in US dollars and then in logarithms. Data source is the IMF, *World Economic Outlook Database*.

NOMSHK: Average absolute deviation of the transformed growth rate of broad money (m^*) from the four-year backward moving average. The transformation uses the formula $m^* = m/(1+m)$, with m denoting the raw data series. Data source is the IMF, *World Economic Outlook Database*.

OPEN: The sum of exports and imports of goods and services, normalized by GDP. Data source is the IMF, *World Economic Outlook Database*.

POLINST: A measure of political instability, defined as the sum of (1) the number of changes in effective executives of a country in each year, and (2) a dummy for the year in which legislative election takes place. Data source is the Polity III dataset from Harvard-CID database on political institutions.

RERVOL: Standard deviation of monthly changes of real effective exchange rate in each year. Data source is the IMF, *Information Notice System*.

RESERVE: Non-gold international reserves, normalized by broad money. Data source is the IMF, *International Financial Statistics*.

SIZE: Gross Domestic Products in current prices, expressed in billions of US dollars and then in logarithms. Data source is the IMF, *International Financial Statistics*.

References

- Barro, R. J., and D. B. Gordon, 1983, "Rules, Discretion, and Reputation in a Model of Monetary Policy," *Journal of Monetary Economics* 12: 101-121.
- Berger, H., J.-E. Sturm, and J. de Haan, 2000, "An Empirical Investigation into Exchange Rate Regime Choice and Exchange Rate Volatility," CESifo Working Paper No. 263.
- Bernhard, W., and D. Leblang, 1999, "Democratic Institutions and Exchange-rate Commitments," *International Organization*, Vol. 53, No. 1 (Winter), pp. 71-97.
- Boyer, R. S., 1978, "Optimal Foreign Exchange Market Intervention," *Journal of Political Economy*: 1045-1055.
- Bubula, A., and İ. Ötker-Robe, 2002, "The Evolution of Exchange Rate Regimes Since 1990: Evidence from De Facto Policies," IMF Working Paper No. 02/155.
- Calvo, A. G., and C. M. Reinhart, 2002, "Fear of Floating," *Quarterly Journal of Economics*, CXVII (2002): 379-408.
- Dreyer, J. S., 1978, "Determinants of Exchange-Rate Regimes for Currencies of Developing Countries: Some Preliminary Results," *World Development*, Vol. 6 (April), pp. 437-445.
- Edwards, S., 1996, "The Determinants of the Choice Between Fixed and Flexible Exchange-rate Regimes," NBER Working Paper No. 5756.
- Edwards, S., 1998, "Exchange Rate Anchors and Inflation: A Political Economy Approach," in S. Eijffinger and H. Huizinga eds., *Positive Political Economy: Theory and Evidence* (Cambridge: Cambridge University Press).
- Fратиanni, M., and J. von Hagen, 1992, *The European Monetary System and European Monetary Union* (Boulder and Oxford: Westview Press).

Geweke, J., 1991, "Efficient Simulation from the Multivariate Normal and Student t -distributions Subject to Linear Constraints," *Computer Science and Statistics: Proceedings of the Twenty-Third Symposium on the Interface*, pp. 571-578.

Ghosh, A. R., A.-M. Gulde, J. Ostry, and H. Wolf, 1997, "Does the Nominal Exchange Rate Matter?" NBER Working Paper 5874.

Ghosh, A. R., A.-M. Gulde, J. Ostry, and H. Wolf, 2002, *Exchange Rate Regimes: Choices and Consequences* (Cambridge, MA, and London: The MIT Press).

Goldstein, M., 1980, "Have Flexible Exchange Rates Handicapped Macroeconomic Policy?" *Special Papers in International Economics*, No. 14, International Finance Section, Princeton University.

Hajivassiliou, V., and D. McFadden, 1998, "The Method of Simulated Scores for the Estimation of LDV Models," *Econometrica*, Vol. 66, No. 4, pp. 863-896.

Heckman, J., 1981a, "Statistical Models for Discrete Panel Data," in C. F. Manski and D. McFadden eds., *Structural Analysis of Discrete Data with Econometric Applications* (Cambridge, MA, and London: The MIT Press).

Heckman, J., 1981b, "The Incidental Parameters Problem and the Problem of Initial Conditions in Estimating a Discrete Time-Discrete Data Stochastic Process," in C. F. Manski and D. McFadden eds., *Structural Analysis of Discrete Data with Econometric Applications* (Cambridge, MA, and London: The MIT Press).

Heller, H. R., 1978, "Determinants of Exchange Rate Practices," *Journal of Money, Credit, and Banking*, Vol. 10 (August): 308-321.

Holden, P., M. Holden, and E. C. Suss, 1979, "The Determinants of Exchange Rate Flexibility: An Empirical Investigation," *The Review of Economics and Statistics*, Vol. LXI, No. 3 (August): 327-333.

Honkapohja, S., and P. Pikkarainen, 1994, "Country Characteristics and the Choice of the Exchange Rate Regime: Are Mini-skirts Followed by Maxis?" in J. Åkerholm and A. Giovannini eds., *Exchange Rate Policies in the Nordic Countries* (London: CEPR).

Hsiao, C., 1986, *Analysis of Panel Data* (Cambridge: Cambridge University Press).

Juhn, G., and P. Mauro, 2002, "Long-Run Determinants of Exchange Rate Regimes: A Simple Sensitivity Analysis," IMF Working Paper No. 02/104.

Keane, M., 1994, "A Computationally Practical Simulation Estimator for Panel Data," *Econometrica*, Vol. 62, No. 1, pp. 95-116.

Kenen, P. B., 1969, "The Theory of Optimum Currency Areas: An Eclectic View," in R. Mundell and A. Swoboda, eds., *Monetary Problems of the International Economy* (Chicago: University of Chicago Press).

Levy-Yeyati, E., and F. Sturzenegger, 2003, "A De Facto Classification of Exchange Rate Regimes: A Methodological Note," forthcoming in *American Economic Review*.

McKinnon, R., 1963, "Optimum Currency Areas," *American Economic Review* 53 (September): 717-725.

McKinnon, R., 1981, "The Exchange Rate and Macroeconomic Policy: Changing Postwar Perceptions," *Journal of Economic Literature* 19(2): 531-537.

Méon, P.-G., and J.-M. Rizzo, 2002, "The Viability of Fixed Exchange Rate Commitments: Does Politics Matter? A Theoretical and Empirical Investigation," *Open Economies Review*, Vol. 13, No. 2, pp. 111-132.

Melitz, J., 1988, "Monetary Discipline and Cooperation in the ERM: A Synthesis," in F. Giavazzi, S. Micossi, and M. Miller eds., *The European Monetary System* (Cambridge: Cambridge University Press).

Melvin, M., 1985, "The Choice of an Exchange Rate System and Macroeconomic Stability," *Journal of Money, Credit, and Banking*, Vol. 17, No. 4 (November, Part 1): 467-478.

Mundell, R., 1961, "A Theory of Optimal Currency Areas," *American Economic Review* 51 (September): 657-665.

Poirson, H., 2001, "How Do Countries Choose Their Exchange Rate Regime?" IMF Working Paper 01/46.

Reinhart, C., and K. Rogoff, 2003, "The Modern History of Exchange Rate Arrangements: A Reinterpretation," forthcoming in *Quarterly Journal of Economics*.

Rizzo, J.-M., 1998, "The Economic Determinants of the Choice of an Exchange Rate Regime: A Probit Analysis," *Economics Letters* 59 (1998): 283-287.

Savvides, A., 1990, "Real Exchange Rate Variability and the Choice of Exchange Rate Regime by Developing Countries," *Journal of International Money and Finance* (1990), 9: 440-454.

Savvides, A., 1993, "Pegging the Exchange Rate and the Choice of a Standard by LDCs: A Joint Formulation," *Journal of Economic Development*, Vol. 18, No. 2 (December): 107-125.

Train, K., 2002, *Discrete Choice Methods with Simulation* (Cambridge, MA : The MIT Press).

Von Hagen, J., and J. Zhou, 2002a, "The Choice of Exchange Rate Regimes: An Empirical Analysis for Transition Economies," ZEI Working Paper B02-03, University of Bonn.

Von Hagen, J., and J. Zhou, 2002b, "Official and De Facto Exchange Rate Regimes in Transition Countries," ZEI Working Paper B02-13, University of Bonn.

Table 1
Empirical Studies on the Choice of Exchange Rate Regimes: A Selected Overview⁽¹⁾

Studies	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)	(XI)	(XII)	(XIII)	(XIV)
Countries ⁽²⁾	88 ^(a)	64 ^(b)	39 ^(a)	43 ^(a)	125 ^(b)	63 ^(b)	70 ^(b)	125 ^(a)	20 ^(c)	65 ^(a)	93 ^(a)	125 ^(b)	130 ^(b)	25 ^(d)
Years	1976	1979	1976-1984	1979-1986	1991	1980-1992	1979-1992	1977-1995	1974-1995	1980-1994	1999	1980-1994	1990, 2000	1990-1999
Regimes ⁽³⁾	O	O	B	B, O	B, O, M	B	B	B, O	B	B	O	B	B, M	O
Methods ⁽⁴⁾	CS	CS	PP	PP	CS	PP	CS	CS	PP	REP	CS	PP	CS	PP
Variables ⁽⁵⁾														
Trade openness	+	-	+	+	+*/-			-*	+	-*	+	-*	+	+
Com. Concentr.	+		-*		+						-*			-*
Geo. Concentr.	+	-/+	-	+	-*			+			-	+	+/-	+
Economic size	-	-*		-*	-			-*			-	-*	-*	+
Dev. level			-*		+	-*/+*	+	+			-/+	+	+*/-	-*
Nominal shocks		+	+	+		+			-					
Real shocks					-	-*	-			+	-*		-/+*	
Home inflation		-		-*		-*	-*	-*			-*		-*	+
RER variation			-*			-*	-*							+/-
Foreign inflation		-*		-*						+		+		
Reserve						+		-*		-	+		-/+	+
Fiscal balance								+						+
Current account							+	+/-*						
Capital mobility			+	-*	-/+						+		+/-	
Pol. instability						-*	-*		-*	-*	+	-*	-*	
Capital controls						+			+		+		+*/-	

Notes:

(1) The studies included in the table are: (I) Dreyer, 1978; (II) Melvin, 1985; (III) Savvides, 1990; (IV) Savvides, 1993; (V) Honkapohja and Pikkariainen, 1994; (VI) Edwards, 1996; (VII) Edwards, 1998; (VIII) Rizzo, 1998; (IX) Bernhard and Leblang, 1999; (X) Berger et al., 2000; (XI) Poirson, 2001; (XII) Méon and Rizzo, 2002; (XIII) Juhn and Mauro, 2002; (XIV) von Hagen and Zhou, 2002a.

(2) The sample covers (a) developing countries, (b) developed and developing countries, (c) developed countries, or (d) transition economies.

(3) Regimes are classified as binary choices (B), ordered choices with three regimes (O), or non-ordered multiple choices with three regimes (M).

(4) Methods of estimation include cross-section (CS), pooled panel (PP), and random-effect panel (REP).

(5) A positive (+) sign means that the variable is positively associated with the probability of adopting fixed or pegged exchange rate regimes. An asterisk (*) means that the coefficient is generally significant at 10% or higher levels.

Table 2
The IMF Classification of Exchange Rate Regimes

Code	Old Classification: before 1998 ⁽¹⁾	New Classification: since 1998 ⁽²⁾
1	Single currency peg	No separate legal tender
2	SDR peg	Currency board arrangements
3	Other composite currency peg	Other conventional fixed pegs
4	Flexibility limited vis-à-vis a single currency	Horizontal bands
5	Flexibility limited vis-à-vis a group of currencies	Crawling pegs
6	Exchange rate adjusted according to a set of indicators	Crawling bands
7	Other managed floating	Managed floating with no pre-announced path for the exchange rate
8	Independently floating	Independently floating

Source: IMF, *AREAER* (various issues).

Notes:

(1) For the period 1977-1981, regime types 1, 2, 3, 5, 6, and 8 can be identified. For the period 1982-1995, all the 8 regime types can be identified. For the period 1996-1997, regime type 6 is excluded from the classification.

(2) The new classification started on January 1, 1999, which was used as the classification for 1998 on December 31.

Table 3

Exchange Rate Regimes in Developing Countries: 1977-2000

Code⁽¹⁾	1977-1980		1981-1985		1986-1990		1991-1995		1996-1997		1998-2000	
	Obs.	%	Obs.	%	Obs.	%	Obs.	%	Obs.	%	Obs.	%
1, 2	304	68.6	335	54.9	310	47.6	271	35.8	92	29.1	94	19.8
3	57	12.9	110	18.0	136	20.9	125	16.5	36	11.4	127	26.8
4, 5, 6	15	3.4	53	8.7	40	6.1	39	5.2	10	3.2	57	12.0
7	0	0.0	66	10.8	102	15.7	137	18.1	89	28.2	78	16.5
8	67	15.1	46	7.5	63	9.7	185	24.4	89	28.2	118	24.9
Total	443	100.0	610	100.0	651	100.0	757	100.0	316	100.0	474	100.0
Country	115		127		132		158		158		158	

Source: Own calculations based on the IMF, *AREAER* (various issues).

Note:

(1) For the meanings of the regime codes, see Table 2.

Table 4
Means and Standard Deviations of Regime Determinants

	Full Sample		Fix ⁽¹⁾	Inter ⁽¹⁾	Flex ⁽¹⁾	z-statistics	
	Mean	S.D.	Mean	Mean	Mean	Inter-Fix	Flex-Fix
OPEN	0.813	0.650	0.856	0.768	0.741	-1.269	-3.194
GCON	0.361	0.136	0.358	0.393	0.358	0.500	-0.011
SIZE	1.539	2.060	0.889	2.995	2.450	30.703	43.456
LEVEL	6.970	1.243	6.903	7.985	6.885	15.770	-0.519
FINDEV	0.464	0.827	0.526	0.408	0.364	<i>-1.723</i>	-4.494
CPINF	0.148	0.190	0.111	0.145	0.217	0.505	2.949
RERVOL	0.035	0.094	0.032	0.041	0.038	0.131	0.152
NOMSHK	0.065	0.064	0.063	0.052	0.070	-0.170	0.193
RESERVE	0.341	0.411	0.342	0.347	0.337	0.074	-0.141
FISCAL	-0.049	0.080	-0.050	-0.043	-0.048	0.103	0.069
CA	-0.050	0.134	-0.059	-0.010	-0.043	0.714	0.439
KCONTR	2.417	1.265	2.483	1.949	2.386	-7.789	-2.689
FREEIDX	3.886	1.863	3.765	3.925	4.109	2.337	9.576
POLINST	0.351	0.655	0.326	0.282	0.420	-0.643	2.610

Notes:

(1) “Fix”, “Inter”, or “Flex” stands for fixed, intermediate, or flexible regimes, respectively, based on the basic regime classification. The z-statistics are for the null hypothesis of equal means across two regimes, with numbers in bold significant at 5% level and numbers in italic significant at 10% level.

Table 5
Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	OPEN	1.00													
2	GCON	0.06	1.00												
3	SIZE	-0.29	-0.09	1.00											
4	LEVEL	0.30	0.16	0.35	1.00										
5	FINDEV	0.06	-0.09	-0.01	0.08	1.00									
6	CPINF	-0.12	-0.07	0.12	-0.15	-0.03	1.00								
7	RERVOL	-0.08	-0.07	-0.02	-0.14	0.01	0.38	1.00							
8	NOMSHK	-0.02	-0.03	-0.14	-0.17	-0.10	0.34	0.13	1.00						
9	RESERVE	0.10	0.01	-0.15	0.00	-0.10	-0.02	0.01	0.06	1.00					
10	FISCAL	-0.04	0.10	0.15	0.20	-0.06	-0.10	-0.11	-0.10	0.16	1.00				
11	CA	-0.08	0.04	0.23	0.28	-0.01	-0.06	-0.06	-0.07	0.07	0.39	1.00			
12	KCONTR	-0.27	-0.09	0.02	-0.37	-0.01	0.25	0.13	0.04	-0.09	-0.10	-0.16	1.00		
13	FREEIDX	0.20	0.26	-0.05	0.34	-0.01	-0.02	-0.07	-0.11	0.07	0.07	0.03	-0.11	1.00	
14	POLINST	-0.03	0.06	0.11	0.03	-0.00	0.09	0.07	0.01	-0.04	-0.01	0.01	0.04	0.14	1.00

Table 6a
Static Random Effects Panel Model Estimations, with the Basic Regime Classification

	β_1	β_2	β_1	β_2	β_1	β_2	β_1	β_2
OPEN	-0.04 (0.19)	0.47** (0.12)	-0.13 (0.34)	0.52** (0.12)	-0.45* (0.26)	0.44** (0.11)	-0.15 (0.73)	1.40** (0.27)
GCON	1.83** (0.70)	1.11** (0.44)	2.06** (0.81)	1.80** (0.61)	1.98** (0.75)	1.88** (0.48)	0.68 (1.84)	1.19* (0.67)
SIZE	0.41** (0.07)	0.60** (0.05)	0.39** (0.07)	0.61** (0.08)	0.44** (0.07)	0.62** (0.05)	0.34** (0.15)	0.63** (0.07)
LEVEL	0.65** (0.09)	-0.35** (0.08)	0.71** (0.12)	-0.41** (0.08)	0.71** (0.11)	-0.38** (0.07)	0.87** (0.27)	-0.67** (0.13)
FINDEV	-2.14** (0.48)	-1.82** (0.26)	-2.09** (0.52)	-1.42** (0.32)	-1.55** (0.56)	-1.11** (0.30)	-2.18* (1.20)	-1.66** (0.56)
CPINF			5.22** (0.96)	6.39** (0.87)	5.57** (0.86)	6.59** (0.65)	6.13** (1.27)	6.33** (0.78)
RERVOL			-11.55** (4.33)	-6.65** (1.91)	-11.89** (4.29)	-6.99** (1.71)	-15.28** (5.31)	-7.48** (1.93)
NOMSHK			-3.78* (2.23)	-2.15* (1.21)	-5.92** (2.32)	-3.00** (1.21)	-2.17 (3.43)	-1.41 (1.63)
RESERVE					2.38** (0.43)	0.75** (0.28)	3.14** (0.75)	-0.79* (0.48)
FISCAL					-5.55** (1.45)	-1.95 (1.22)	-0.55 (2.41)	-0.45 (1.51)
CA					2.18** (0.92)	1.04 (0.86)	-1.09 (1.84)	1.62 (1.72)
KCONTR							0.14 (0.18)	-0.10 (0.07)
FREEIDX							-0.12 (0.13)	0.32** (0.05)
POLINST							-0.52** (0.26)	-0.05 (0.11)
σ_{11}	0.08 (0.20)		0.14 (0.56)		0.03 (0.12)		0.78 (0.81)	
σ_{12}	0.07 (0.17)		0.18 (0.46)		0.05 (0.13)		0.02 (0.44)	
σ_{22}	0.07 (0.25)		0.43 (0.70)		0.11 (0.23)		0.06 (0.21)	
Log-likelihood	-1589.77		-1414.45		-1328.06		-771.22	
Countries	128		124		118		94	
Obs. ⁽¹⁾	1266 / 170 / 794 / 2230		1200 / 163 / 769 / 2132		1150 / 158 / 735 / 2043		656 / 87 / 448 / 1191	
% pred. ⁽²⁾	81.4 / 6.5 / 63.4 / 69.2		84.5 / 6.7 / 67.1 / 72.3		85.7 / 13.9 / 67.3 / 73.5		83.4 / 6.9 / 67.0 / 71.6	

Notes: * or ** indicates significance at 10% or 5% level, respectively. Constants and period dummies not reported. Standard errors in parentheses.

(1) Number of observations for Fixed / Intermediate / Flexible / All exchange rate regimes.

(2) Correct predictions for Fixed / Intermediate / Flexible / All exchange rate regimes.

Table 6b

Static Random Effects Panel Model Estimations, with the Alternative Regime Classification

	β_1	β_2	β_1	β_2	β_1	β_2	β_1	β_2
OPEN	0.53* (0.29)	0.64** (0.30)	0.12 (0.12)	0.24 (0.19)	0,03 (0,08)	0,24 (0,16)	2,66** (0,50)	3,00** (0,54)
GCON	-5.02** (1.38)	-3.66** (1.42)	-2.98** (0.48)	-1.11* (0.66)	-3,17** (0,48)	-1,05 (0,66)	-6,05** (1,27)	-3,04** (1,24)
SIZE	1.22** (0.31)	1.24** (0.31)	0.41** (0.06)	0.43** (0.07)	0,46** (0,04)	0,45** (0,07)	0,96** (0,16)	0,58** (0,15)
LEVEL	0.14 (0.14)	-0.38** (0.14)	0.11* (0.06)	-0.42** (0.08)	0,15** (0,06)	-0,38** (0,11)	-0,20 (0,14)	-0,94** (0,18)
FINDEV	-0.63* (0.32)	-2.13** (0.52)	-0.19** (0.09)	-1.37** (0.41)	-0,04 (0,06)	-1,95** (0,57)	-0,13 (0,26)	-2,70** (0,93)
CPINF			5.20** (0.71)	7.22** (0.79)	5,58** (0,66)	7,72** (0,83)	4,40** (0,94)	8,23** (1,04)
RERVOL			-16.74** (2.45)	-8.90** (2.09)	-16,05** (2,33)	-9,20** (2,09)	-14,68** (3,15)	-10,38** (2,32)
NOMSHK			-7.16** (1.33)	-7.73** (1.68)	-8,84** (1,33)	-9,61** (1,88)	-6,25** (2,20)	-6,26** (2,60)
RESERVE					1,96** (0,28)	1,33** (0,40)	0,51 (0,49)	-0,39 (0,63)
FISCAL					-3,54** (1,05)	-3,10* (1,86)	6,24** (1,86)	5,54** (2,41)
CA					1,61** (0,66)	2,55** (1,22)	-3,11** (1,26)	1,84 (1,65)
KCONTR							0,25** (0,12)	-0,35** (0,14)
FREEIDX							0,23** (0,07)	0,51** (0,08)
POLINST							0,20 (0,18)	0,08 (0,19)
σ_{11}	20.41* (12.24)		0.45 (0.59)		0.05 (0.16)		1.50 (1.49)	
σ_{12}	19.50 (12.09)		0.68 (0.62)		0.22 (0.42)		0.20 (0.91)	
σ_{22}	19.03 (12.33)		1.30 (0.85)		1.20 (0.99)		0.18 (0.34)	
Log-likelihood	-1947.30		-1735.16		-1603.45		-835.26	
Countries	128		124		118		94	
Obs. ⁽¹⁾	814 / 1025 / 391 / 2230		756 / 1003 / 373 / 2132		726 / 968 / 349 / 2043		431 / 561 / 199 / 1191	
% pred. ⁽²⁾	49.6 / 72.5 / 32.0 / 57.0		62.3 / 75.0 / 27.9 / 62.2		66.4 / 77.2 / 22.9 / 64.1		75.4 / 79.7 / 34.7 / 70.6	

Notes: * or ** indicates significance at 10% or 5% level, respectively. Constants and period dummies not reported. Standard errors in parentheses.

(1) Number of observations for Fixed / Intermediate / Flexible / All exchange rate regimes.

(2) Correct predictions for Fixed / Intermediate / Flexible / All exchange rate regimes.

Table 7a

Dynamic Random Effects Panel Model Estimations, with the Basic Regime Classification

	γ_1 and β_1	γ_2 and β_2	γ_1 and β_1	γ_2 and β_2	γ_1 and β_1	γ_2 and β_2	γ_1 and β_1	γ_2 and β_2
LAGINT	7.59** (0.63)	3.18** (55)	7.96** (0.65)	3.44** (0.57)	8.19** (0.81)	3.60** (0.64)	8.63** (1.03)	3.48** (0.90)
LAGFLEX	4.68** (0.53)	5.93** (0.45)	4.75** (0.59)	5.87** (0.47)	4.96** (0.62)	5.79** (0.46)	4.25** (0.71)	5.30** (0.42)
OPEN	-0.18 (0.39)	0.15 (0.17)	-0.28 (0.61)	0.20 (0.19)	-0.57 (0.54)	0.23 (0.21)	0.04 (0.36)	0.94** (0.39)
GCON	0.81 (1.18)	0.73 (0.82)	0.68 (1.47)	1.04 (0.90)	0.65 (3.28)	0.75 (0.97)	-1.07 (2.45)	0.29 (1.65)
SIZE	0.15 (0.12)	0.34** (0.07)	0.12 (0.14)	0.30** (0.07)	0.14 (0.17)	0.31** (0.08)	-0.12 (0.23)	0.32** (0.12)
LEVEL	0.40** (0.18)	-0.32** (0.11)	0.36 (0.25)	-0.33** (0.13)	0.46** (0.23)	-0.22 (0.14)	0.81 (0.50)	-0.37 (0.31)
FINDEV	-1.42* (0.85)	-0.76* (0.40)	-1.53 (1.11)	-0.50 (0.40)	-1.29 (1.22)	-1.19* (0.67)	-3.31 (2.31)	-0.93 (1.21)
CPINF			2.73** (1.27)	3.07** (0.70)	2.32* (1.36)	2.74** (0.78)	2.15 (1.82)	2.90** (1.12)
RERVOL			-16.71** (6.74)	-1.81 (1.34)	-13.84** (6.60)	-1.72 (1.36)	-16.85** (8.08)	-1.69 (1.42)
NOMSHK			-1.63 (3.86)	-2.86 (2.19)	-1.92 (5.40)	-3.63* (2.19)	2.08 (4.25)	-3.66 (2.75)
RESERVE					1.21 (0.74)	-0.03 (0.20)	0.56 (1.40)	-1.15 (1.09)
FISCAL					0.49 (13.58)	-0.28 (2.97)	5.10 (6.95)	0.60 (6.30)
CA					-0.73 (2.31)	-0.60 (1.48)	-3.99 (4.08)	-0.85 (3.08)
KCONTR							0.08 (0.50)	0.02 (0.40)
FREEIDX							-0.00 (0.13)	0.23** (0.10)
POLINST							-0.08 (0.37)	0.19 (0.20)
σ_{11}	0.03 (0.41)		0.02 (0.30)		0.01 (0.11)		0.05 (0.38)	
σ_{12}	0.03 (0.27)		0.02 (0.23)		-0.01 (0.12)		0.03 (0.13)	
σ_{22}	0.23 (0.47)		0.18 (0.49)		0.04 (0.47)		0.11 (0.37)	
Log-likelihood	-592.64		-535.05		-506.71		-308.15	
Countries	128		124		118		94	
Obs. ⁽¹⁾	1259 / 170 / 794 / 2223		1193 / 163 / 769 / 2125		1143 / 158 / 735 / 2036		654 / 87 / 448 / 1189	
% pred. ⁽²⁾	96.6 / 80.0 / 90.2 / 93.0		96.8 / 81.0 / 90.8 / 93.4		96.9 / 81.0 / 90.7 / 93.4		96.9 / 85.1 / 87.7 / 92.6	

Notes: * or ** indicates significance at 10% or 5% level, respectively. Constants and period dummies not reported. Standard errors in parentheses.

(1) Number of observations for Fixed / Intermediate / Flexible / All exchange rate regimes.

(2) Correct predictions for Fixed / Intermediate / Flexible / All exchange rate regimes.

Table 7b

Dynamic Random Effects Panel Model Estimations, with the Alternative Regime Classification

	γ_1 and β_1	γ_2 and β_2	γ_1 and β_1	γ_2 and β_2	γ_1 and β_1	γ_2 and β_2	γ_1 and β_1	γ_2 and β_2
LAGINT	7.00** (0.33)	4.01** (0.37)	6.98** (0.35)	4.08** (0.40)	7.00** (0.42)	4.15** (0.44)	6.53** (0.64)	3.14** (0.52)
LAGFLEX	5.04** (0.44)	7.09** (0.54)	4.96** (0.50)	6.89** (0.52)	4.96** (0.54)	6.87** (0.52)	4.56** (0.69)	6.16** (0.75)
OPEN	-0.13 (0.25)	-0.14 (0.28)	-0.27 (0.32)	-0.16 (0.46)	-0.47 (0.36)	-0.07 (0.52)	0.84 (0.57)	1.19* (0.68)
GCON	-1.13 (0.94)	-0.78 (1.07)	-1.30 (1.15)	-0.64 (1.30)	-1.48 (1.10)	-0.97 (1.28)	-3.78** (1.36)	-1.88 (1.43)
SIZE	0.16** (0.08)	0.23** (0.09)	0.13 (0.08)	0.20** (0.09)	0.13 (0.09)	0.20 (0.13)	0.31** (0.15)	0.10 (0.17)
LEVEL	0.06 (0.12)	-0.27* (0.14)	0.05 (0.13)	-0.25* (0.15)	0.15 (0.17)	-0.12 (0.24)	0.10 (0.23)	-0.37 (0.27)
FINDEV	0.12 (0.09)	-0.48 (0.35)	0.08 (0.09)	-0.44 (0.50)	0.09 (0.11)	-1.77** (0.77)	0.13 (0.41)	-2.01 (1.32)
CPINF			2.71** (0.94)	2.76** (0.84)	2.69** (0.98)	2.32** (0.90)	0.84 (1.23)	2.61** (1.11)
RERVOL			-12.10** (3.28)	-1.21 (1.05)	-12.00** (3.49)	-1.10 (1.02)	-10.57** (4.31)	-1.43 (1.26)
NOMSHK			-6.00** (2.53)	-6.34** (2.82)	-6.77** (2.68)	-7.12** (2.95)	-3.56 (2.99)	-6.71* (3.56)
RESERVE					0.49 (0.57)	-0.13 (0.75)	-0.23 (0.79)	-0.80 (0.85)
FISCAL					-0.28 (0.97)	-1.66 (1.62)	4.53* (2.62)	1.54 (3.15)
CA					-0.93 (1.27)	0.18 (1.12)	-3.87* (2.10)	0.78 (2.26)
KCONTR							0.27* (0.17)	0.08 (0.18)
FREEIDX							0.13 (0.11)	0.40** (0.12)
POLINST							0.54** (0.24)	0.22 (0.26)
σ_{11}	0.06 (0.15)		0.01 (0.12)		0.09 (0.25)		0.53 (0.71)	
σ_{12}	0.02 (0.02)		0.00 (0.07)		0.03 (0.16)		-0.28 (0.45)	
σ_{22}	0.25 (0.46)		0.09 (0.32)		0.01 (0.09)		0.27 (0.74)	
Log-likelihood	-676.07		-617.61		-588.27		-388.32	
Countries	128		124		118		94	
Obs. ⁽¹⁾	810 / 1022 / 391 / 2223		752 / 1000 / 373 / 2125		722 / 965 / 349 / 2036		431 / 559 / 199 / 1189	
% pred. ⁽²⁾	97.0 / 91.2 / 81.8 / 91.7		97.2 / 91.6 / 81.8 / 91.9		97.1 / 91.5 / 81.7 / 91.8		96.1 / 90.2 / 74.4 / 89.7	

Notes: * or ** indicates significance at 10% or 5% level, respectively. Constants and period dummies not reported. Standard errors in parentheses.

(1) Number of observations for Fixed / Intermediate / Flexible / All exchange rate regimes.

(2) Correct predictions for Fixed / Intermediate / Flexible / All exchange rate regimes.

ZEI Papers

PP = Policy Paper

WP = Working Paper

PP B97-01	A Stability Pact for Europe (a Forum organized by ZEI)
PP B97-02	Employment and EMU (Deutsch-Französisches Wirtschaftspolitisches Forum/ Forum Economique Franco-Allemand)
PP B97-03	Liberalising European Markets for Energy and Telecommunications: Some Lessons from the US Electric Utility Industry (Tom Lyon and John Mayo)
PP B97-04	Macroeconomic Stabilization with a Common Currency: Does European Monetary Unification Create a Need for Fiscal Insurance or Federalism? (Kenneth Kletzer)
PP B98-01	Budgeting Institutions for Aggregate Fiscal Discipline (Jürgen von Hagen)
PP B98-02	Trade with Low-Wage Countries and Wage Inequality (Jaleel Ahmad)
PP B98-03	Central Bank Policy in a More Perfect Financial System (Jürgen von Hagen and Ingo Fender)
PP B98-04	The EMU's Exchange Rate Policy (Deutsch-Französisches Wirtschaftspolitisches Forum/ Forum Economique Franco-Allemand)
PP B98-05	Estimating a European Demand for Money (Bernd Hayo)
PP B98-06	Monetary Union, Asymmetric Productivity Shocks and Fiscal Insurance: an Analytical Discussion of Welfare Issues (Kenneth M. Kletzer)
PP B98-07	Designing Voluntary Environmental Agreements in Europe: Some Lessons from the U.S. EPA's 33/50 Program (John W. Maxwell)
WP B98-08	Money-Output Granger Causality Revisited: An Empirical Analysis of EU Countries (Bernd Hayo)
WP B98-09	US Monetary Policy AND Monetary Policy and the ESCB (Robert L. Hetzel)
PP B98-10	Der Wettbewerb der Rechts- und politischen Systeme in der Europäischen Union (Martin Seidel)
WP B98-11	Exchange Rate Regimes in the Transition Economies: Case Study of the Czech Republic: 1990-1997 (Julius Horvath)
PP B98-11A	Die Bewertung der „dauerhaft tragbaren öffentlichen Finanzlage“ der EU Mitgliedstaaten beim Übergang zur dritten Stufe der EWWU (Rolf Strauch)
WP B98-12	Price Stability and Monetary Policy Effectiveness when Nominal Interest Rates are Bounded at Zero (Athanasios Orphanides and Volker Wieland)
WP B98-13	Fiscal Policy and Intranational Risk-Sharing (Jürgen von Hagen)
WP B98-14	Free Trade and Arms Races: Some Thoughts Regarding EU-Russian Trade (Rafael Reuveny and John Maxwell)
WP B98-15	Can Taxing Foreign Competition Harm the Domestic Industry? (Stefan Lutz)
PP B98-16	Labour Market & Tax Policy in the EMU (Deutsch-Französisches Wirtschaftspolitisches Forum/ Forum Economique Franco-Allemand)
WP B99-01	The Excess Volatility of Foreign Exchange Rates: Statistical Puzzle or Theoretical Artifact? (Robert B.H. Hauswald)
WP B99-02	The Consequences of Labour Market Flexibility: Panel Evidence Based on Survey Data (Rafael Di Tella and Robert MacCulloch)
WP B99-03	The Macroeconomics of Happiness (Rafael Di Tella, Robert MacCulloch and Andrew J. Oswald)
WP B99-04	The Finance-Investment Link in a Transition Economy: Evidence for Poland from Panel Data (Christian Weller)
WP B99-05	Tumbling Giant: Germany's Experience with the Maastricht Fiscal Criteria (Jürgen von Hagen and Rolf Strauch)
WP B99-06	Productivity Convergence and Economic Growth: A Frontier Production Function Approach (Christopher M. Cornwell and Jens-Uwe Wächter)
WP B99-07	Comovement and Catch-up in Productivity Across Sectors: Evidence from the OECD (Christopher M. Cornwell and Jens-Uwe Wächter)
WP B99-08	The Connection Between More Multinational Banks and Less Real Credit in Transition Economies (Christian Weller)
WP B99-09	Monetary Policy, Parameter Uncertainty and Optimal Learning (Volker Wieland)

You can download these papers at the ZEI web site
www.zei.de/zei_english/publikation/publ_zeib_pp.htm

WP B99-10	Financial Liberalization, Multinational Banks and Credit Supply: the Case of Poland (Christian Weller)
PP B99-11	Financial Supervision and Policy Coordination in the EMU (Deutsch-Französisches Wirtschaftspolitisches Forum / Forum Economique Franco-Allemand)
WP B99-12	Size Distortions of Tests of the Null Hypothesis of Stationarity: Evidence and Implications for Applied Work (Mehmet Caner and Lutz Kilian)
WP B99-13	Financial Fragility or What Went Right and What Could Go Wrong in Central European Banking? (Christian E. Weller and Jürgen von Hagen)
WP B99-14	Industry Effects of Monetary Policy in Germany (Bernd Hayo and Birgit Uhlenbrock)
WP B99-15	Financial Crises after Financial Liberalization: Exceptional Circumstances or Structural Weakness? (Christian E. Weller)
WP B99-16	Multinational Banks and Development Finance (Christian E. Weller and Mark J. Scher)
WP B99-17	Stability of Monetary Unions: Lessons from the Break-up of Czechoslovakia (Jan Fidrmuc, Julius Horvath and Jarko Fidrmuc)
WP B99-18	Why are Eastern Europe's Banks not failing when everybody else's are? (Christian E. Weller and Bernard Morzuch)
WP B99-19	The Evolution of Monetary Policy in Transition Economies (Ali M. Kutan and Josef C. Brada)
WP B99-20	Subnational Government Bailouts in Germany (Helmut Seitz)
WP B99-21	The End of Moderate Inflation in Three Transition Economies? (Josef C. Brada and Ali M. Kutan)
WP B99-22	Partisan Social Happiness (Rafael Di Tella and Robert MacCulloch)
WP B99-23	Informal Family Insurance and the Design of the Welfare State (Rafael Di Tella and Robert MacCulloch)
WP B99-24	What Makes a Revolution? (Robert MacCulloch)
WP B99-25	Micro and Macro Determinants of Public Support for Market Reforms in Eastern Europe (Bernd Hayo)
WP B99-26	Skills, Labour Costs, and Vertically Differentiated Industries: a General Equilibrium Analysis (Stefan Lutz and Alessandro Turrini)
WP B00-01	Monetary Union and Fiscal Federalism (Kenneth Kletzer and Jürgen von Hagen)
WP B00-02	Inflation Bias and Productivity Shocks in Transition Economies: The Case of the Czech Republic (Josef C. Brada, Arthur E. King and Ali M. Kutan)
WP B00-03	Integration, Disintegration and Trade in Europe: Evolution of Trade Relations During the 1990's (Jarko Fidrmuc and Jan Fidrmuc)
PP B00-04	A New Political Culture in the EU – Democratic Accountability of the ECB (Christa Randzio-Plath)
WP B00-05	Liberalization, Democracy and Economic Performance during Transition (Jan Fidrmuc)
WP B00-06	The Demand for Money in Austria (Bernd Hayo)
PP B00-07	EMU and Economic Growth in Europe (Deutsch-Französisches Wirtschaftspolitisches Forum / Forum Economique Franco-Allemand)
WP B00-08	The Effectiveness of Self-Protection Policies for Safeguarding Emerging Market Economies from Crises (Kenneth Kletzer)
WP B00-09	Rational Institutions Yield Hysteresis (Rafael Di Tella and Robert MacCulloch)
WP B00-10	The Importance of Domestic Political Institutions: Why and How Belgium and Italy qualified for EMU (Mark Hallerberg)
WP B00-11	A Dynamic Approach to Inflation Targeting in Transition Economies (Lucjan T. Orlowski)
PP B00-12	Rechtsetzung und Rechtsangleichung als Folge der einheitlichen europäischen Währung (Martin Seidel)
WP B00-13	Back to the Future: The Growth Prospects of Transition Economies Reconsidered (Nauro F. Campos)
WP B00-14	Sources of Real Exchange Rate Fluctuations in Transition Economies: The Case of Poland and Hungary (Selahattin Dibooglu and Ali M. Kutan)

WP B00-15	Regional Risksharing and Redistribution in the German Federation (Jürgen von Hagen and Ralf Hepp)
PP B00-16	The European Central Bank: Independence and Accountability (Christa Randzio-Plath and Tommaso Padoa-Schioppa)
PP B00-17	Rückführung der Landwirtschaftspolitik in die Verantwortung der Mitgliedsstaaten? – Rechts- und Verfassungsfragen des Gemeinschaftsrechts (Martin Seidel)
WP B00-18	Budget Processes: Theory and Experimental Evidence (Karl-Martin Ehrhart, Roy Gardner, Jürgen v. Hagen and Claudia Keser)
WP B00-19	Income Dynamics and Stability in the Transition Process – General Reflections applied to the Czech Republic (Jens Hölscher)
WP B00-20	Breaking-Up a Nation, from the Inside (Etienne Farvaque)
WP B01-01	Divided Boards: Partisanship through Delegated Monetary Policy (Etienne Farvaque, Gaël Lagadec)
WP B01-02	The Konstanz Seminar on Monetary Theory and Policy at Thirty (Michele Fratianni, Jürgen von Hagen)
WP B01-03	Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness (Rafael di Tella, Robert J. MacCulloch and Andrew J. Oswald)
WP B01-04	The Determination of Unemployment Benefits (Rafael di Tella and Robert J. MacCulloch)
PP B01-05	Trade Rules and Global Governance: A Long Term Agenda / The Future of Banking (Deutsch-Französisches Wirtschaftspolitisches Forum/ Forum Economique Franco-Allemand)
WP B01-06	Opposites Attract: The Case of Greek and Turkish Financial Markets (Konstantinos Drakos and Ali M. Kutan)
WP B01-07	The Convergence of Monetary Policy between Candidate Countries and the European Union (Josef C. Brada and Ali M. Kutan)
WP B01-08	The Functioning of Economic Policy Coordination (Jürgen von Hagen and Susanne Mundtschenk)
WP B01-09	Democracy in Transition Economies: Grease or Sand in the Wheels of Growth? (Jan Fidrmuc)
WP B01-10	Integration of the Baltic States into the EU and Institutions of Fiscal Convergence: A Critical Evaluation of Key Issues and Empirical Evidence (Ali M. Kutan and Niina Pautola-Mol)
WP B01-11	Inflationary Performance in a Monetary Union with Large Wage Setters (Lilia Cavallari)
PP B01-12	The Impact of Eastern Enlargement on EU-Labour Markets / Pensions Reform Between Economic and Political Problems (Deutsch-Französisches Wirtschaftspolitisches Forum/Forum Economique Franco-Allemand)
WP B01-13	German Public Finances: Recent Experiences and Future Challenges (Jürgen von Hagen und Rolf R. Strauch)
WP B01-14	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 (Rolf Strauch and Jürgen von Hagen)
WP B01-15	Programs without Alternative: Public Pensions in the OECD (Christian E. Weller)
WP B01-16	Sources of Inflation and Output Fluctuations in Poland and Hungary: Implications for Full Membership in the European Union (Selahattin Dibooglu and Ali M. Kutan)
WP B01-17	Executive Authority, the Personal Vote, and Budget Discipline in Latin American and Caribbean Countries (Mark Hallerberg and Patrick Marier)
WP B01-18	Monetary Policy in Unknown Territory The European Central Bank in the Early Years (Jürgen von Hagen and Matthias Brückner)
WP B01-19	Detrending and the Money-Output Link: International Evidence (R.W. Hafer and Ali M. Kutan)
WP B01-20	An Empirical Inquiry of the Efficiency of Intergovernmental Transfers for Water Projects based on the WRDA Data (Anna Rubinchik-Pessach)

WP B01-21	Balkan and Mediterranean Candidates for European Union Membership: The Convergence of their Monetary Policy with that of the European Central Bank (Josef C. Brada and Ali M. Kutan)
WP B01-22	Strategic Delegation and International Capital Taxation (Matthias Brückner)
WP B01-23	Migration and Adjustment to Shocks in Transition Economies (Jan Fidrmuc)
WP B01-24	Disintegration and Trade (Jarko and Jan Fidrmuc)
WP B01-25	Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications (Lucjan T. Orlowski)
WP B01-26	Regional Effects of Terrorism on Tourism: Evidence from Three Mediterranean Countries (Konstantinos Drakos and Ali M. Kutan)
WP B01-27	Investor Panic, IMF Actions, and Emerging Stock Market Returns and Volatility: A Panel Investigation (Bernd Hayo and Ali M. Kutan)
PP B01-28	Political Economy of the Nice Treaty: Rebalancing the EU Council / The Future of European Agricultural Policies (Forum Economique Franco-Allemand / Deutsch-Französisches Wirtschaftspolitisches Forum)
WP 01-29	Is Kazakhstan vulnerable to the Dutch Disease? (Karlygash Karalbayeva, Ali M. Kutan and Michael L. Wyzan)
WP B02-01	Does Inflation Targeting Matter? (Manfred J.M. Neumann and Jürgen von Hagen)
WP B02-02	The Euro System and the Federal Reserve System Compared: Facts and Challenges (Karlheinz Ruckriegel and Franz Seitz)
WP B02-03	The Choice of Exchange Rate Systems: An Empirical Analysis for Transition Economies (Jürgen von Hagen and Jizhong Zhou)
WP B02-04	Asymmetric Monetary Policy Effects in EMU (Volker Clausen and Bernd Hayo)
WP B02-05	Real and Monetary Convergence Within the European Union and Between the European Union and Candidate Countries: A Rolling Cointegration Approach (Josef C. Brada, Ali M. Kutan and Su Zhou)
WP B02-06	Is there Asymmetry in Forward Exchange Rate Bias? Multi-Country Evidence (Su Zhou and Ali M. Kutan)
WP B02-07	Perspektiven der Erweiterung der Europäischen Union (Martin Seidel)
WP B02-08	Has the Link between the Spot and Forward Exchange Rates Broken Down? Evidence from Rolling Cointegration Tests (Ali M. Kutan and Su Zhou)
WP B02-09	Monetary Policy in the Euro Area – Lessons from the First Years (Volker Clausen and Bernd Hayo)
PP B02-10	National Origins of European Law: Towards an Autonomous System of European Law? (Martin Seidel)
WP B02-11	The Eurosystem and the Art of Central Banking (Gunnar Heinsohn and Otto Steiger)
WP B02-12	Argentina: The Anatomy of a Crisis (Jiri Jonas)
WP B02-13	De Facto and Official Exchange Rate Regimes in Transition Economies (Jürgen von Hagen and Jizhong Zhou)
WP B02-14	The Long and Short of It: Global Liberalization, Poverty and Inequality (Christian E. Weller and Adam Hersh)
WP B02-15	Does Broad Money Matter for Interest Rate Policy? (Matthias Brückner and Andreas Schabert)
WP B02-16	Regional Specialization and Concentration of Industrial Activity in Accession Countries (Iulia Traistaru, Peter Nijkamp and Simonetta Longhi)
WP B02-17	Specialization and Growth Patterns in Border Regions of Accession Countries (Laura Resmini)
WP B02-18	Regional Specialization and Employment Dynamics in Transition Countries (Iulia Traistaru and Guntram B. Wolff)
WP B02-19	East Germany: Transition with Unification, Experiments and Experiences (Jürgen von Hagen, Rolf R. Strauch and Guntram B. Wolff)
WP B02-20	The Impact of News, Oil Prices, and International Spillovers on Russian Financial Markets (Bernd Hayo and Ali M. Kutan)

WP B02-21	Nominal and Real Stochastic Convergence within the Transition Economies and to the European Union: Evidence from Panel Data (Ali M. Kutun and Taner M. Yigit)
WP B02-22	Der Staat als „Lender of Last Resort“ – oder: Die Achillesferse des Eurosystems (Otto Steiger)
PP B02-23	Legal Aspects of European Economic and Monetary Union (Martin Seidel)
WP B02-24	The Effects of Quotas on Vertical Intra-Industry Trade (Stefan Lutz)
WP B02-25	Trade Policy: „Institutional“ vs. „Economic“ Factors (Stefan Lutz)
WP B02-26	Monetary Convergence and Risk Premiums in the EU Candidate Countries (Lucjan T. Orlowski)
WP B02-27	Poverty Traps and Growth in a Model of Endogenous Time Preference (Debajyoti Chakrabarty)
WP B02-28	Inequality, Politics and Economic Growth (Debajyoti Chakrabarty)
WP B02-29A	Growth and Business Cycles with Imperfect Credit Markets (Debajyoti Chakrabarty)
WP B02-29B	Trade Agreements as Self-Protection (Jennifer Pédussel Wu)
WP B02-30	An Adverse Selection Model of Optimal Unemployment Insurance (Marcus Hagedorn, Shok Kaul and Tim Mennel)
WP B03-01	Die Wirtschafts- und Währungsunion im rechtlichen und politischen Gefüge der Europäischen Union (Martin Seidel)
WP B03-02	Commuting in the Baltic States: Patterns, Determinants, and Gains (Mihails Hazans)
WP B03-03	Europäische Steuerkoordination und die Schweiz (Stefan H Lutz)
WP B03-04	Do Ukrainian Firms Benefit from FDI? (Stefan H Lutz and Oleksandr Talavera)
WP B03-05	Reconsidering the evidence: are Eurozone business cycles converging? (Michael Massmann and James Mitchell)
WP B03-06	Fiscal Discipline and Growth in Euroland Experiences with the Stability and Growth Pact (Jürgen von Hagen)
PP B03-07	Nach Nizza und Stockholm: Stand des Binnenmarktes und Prioritäten für die Zukunft (Martin Seidel)
WP B03-08	The Determination of Capital Controls: Which Role Do Exchange Rate Regimes Play? (Jürgen von Hagen and Jizhong Zhou)
WP B03-09	The European Central Bank and the Eurosystem: An Analysis of the Missing Central Monetary Institution in European Monetary Union (Gunnar Heinsohn and Otto Steiger)
WP B03-10	Foreign Direct Investment and Perceptions of Vulnerability to Foreign Exchange Crises: Evidence from Transition Economies (Josef C. Brada and Vladimír Tomsík)
PP B03-11	Die Weisungs- und Herrschaftsmacht der Europäischen Zentralbank im Europäischen System der Zentralbanken – eine rechtliche Analyse (Martin Seidel)
WP B03-12	What makes regions in Eastern Europe catching up? The role of foreign investment, human resources and geography (Gabriele Tondl and Goran Vuksic)
WP B03-13	The IS Curve and the Transmission of Monetary Policy: Is there a Puzzle? (Charles Goodhart and Boris Hofmann)
WP B03-14	FCIs and Economic Activity: Some International Evidence (Charles Goodhart and Boris Hofmann)
WP B03-15	Employed and unemployed search: the marginal willingness to pay for attributes in Lithuania, the US and the Netherlands (Jos van Ommeren and Mihails Hazans)
WP B03-16	South-East Europe: Economic Performance, Perspectives and Policy Challenges (Iulia Traistaru and Jürgen von Hagen)
WP B03-17	Determinants of inter-regional migration in the baltic countries (Mihails Hazans)
WP B03-18	The Effects of Regional and Industry-Wide FDI Spillovers on Export of Ukrainian Firms (Stefan H. Lutz, Oleksandr Talavera and Sang-Min Park)

WP B03-19	An Empirical Analysis of Competing Explanations of Urban Primacy. Evidence from Asia and the Americas (Ronald L. Moomaw and Mohammed A. Alwosabi)
WP B03-20	Urban Primacy, Gigantism, and International Trade: Evidence from Asia and the Americas (Ronald L. Moomaw and Mohammed A. Alwosabi)
WP B03-21	Reputation Flows: Contractual Disputes and the Channels for Inter-firm Communication (William Pyle)
PP B03-22	Reformzwänge innerhalb der EU angesichts der Osterweiterung (Martin Seidel)
WP B03-23	Economic Integration and Manufacturing Concentration Patterns: Evidence from Mercosur (Iulia Traistaru and Christian Volpe Martincus)
WP B03-24	Monetary Policy Reaction Functions: ECB versus Bundesbank (Bernd Hayo and Boris Hofmann)
WP B03-25	How Flexible are Wages in EU Accession Countries? (Anna Iara and Iulia Traistaru)
WP B03-26	Sovereign Risk Premia in the European Government Bond Market (Kerstin Bernoth, Juergen von Hagen and Ludger Schuknecht)
WP B03-27	The Performance of the Euribor Futures Market: Efficiency and the Impact of ECB Policy Announcements (Kerstin Bernoth and Juergen von Hagen)
WP B03-28	The Effects of Transition and Political Instability on Foreign Direct Investment: Central Europe and the Balkans (Josef C. Brada, Ali M. Kutan and Taner M. Yigit)
WP B03-29	Macroeconomic Implications of Low Inflation in the Euro Area (Jürgen von Hagen and Boris Hofmann)
PP B04-01	Die neuen Schutzklauseln der Artikel 38 und 39 des Beitrittsvertrages: Schutz der alten Mitgliedstaaten vor Störungen durch die neuen Mitgliedstaaten (Martin Seidel)
WP B04-02	Total Factor Productivity and Economic Freedom Implications for EU Enlargement (Ronald L. Moomaw and Euy-Seok Yang)
WP B04-03	Over- and underbidding in central bank open market operations conducted as fixed rate tender (Ulrich Bindseil)
WP B04-04	Who Is in Favor of Enlargement? Determinants of Support for EU Membership in the Candidate Countries' Referenda (Orla Doyle and Jan Fidrmuc)
WP B04-05	Money Rules for the Eurozone Candidate Countries (Lucjan T. Orlowski)
WP B04-06	Rural-Urban Inequality in Africa: a Panel Study of the Effects of Trade Liberalization and Financial Deepening (Mina Balamoune-Lutz and Stefan H. Lutz)
WP B04-07	The Contribution of Income, Social Capital, and Institutions to Human Well-Being in Africa (Mina Balamoune-Lutz and Stefan H. Lutz)
WP B04-08	European Integration, Productivity Growth and Real Convergence (Taner M. Yigit and Ali M. Kutan)
WP B04-09	Testing Creditor Moral Hazard in Sovereign Bond Markets: A Unified Theoretical Approach and Empirical Evidence (Ayşe Y. Evrensel and Ali M. Kutan)
WP B04-10	Economic Integration and Industry Location in transition countries (Laura Resmini)
WP B04-11	Economic Integration and Location of Manufacturing Activities: Evidence from MERCOSUR (Pablo Sanguinetti, Iulia Traistaru and Christian Volpe Martincus)
WP B04-12	Measuring and Explaining Levels of Regional Economic Integration (Jennifer Pédussel Wu)
WP B04-13	The Role of Electoral and Party Systems in the Development of Fiscal Institutions in the Central and Eastern European Countries (Sami Yläoutinen)
WP B04-14	Euro Adoption and Maastricht Criteria: Rules Or Discretion? (Jiri Jonas)
WP B04-15	Do Economic Integration and Fiscal Competition Help to Explain Location Patterns? (Christian Volpe Martincus)

WP B04-16	Does It Matter Where Immigrants Work? Traded Goods, Non-traded Goods, and Sector Specific Employment (Harry P. Bowen and Jennifer Pédussel Wu)
WP B04-17	Foreign Exchange Regime, the Real Exchange Rate and Current Account Sustainability: The Case of Turkey (Sübüdey Togan and Hasan Ersel)
WP B04-18	Transmission Channels of Business Cycles Synchronization in an Enlarged EMU (Iulia Traistaru)
PP B04-19	Die Stellung der Europäischen Zentralbank nach dem Verfassungsvertrag (Martin Seidel)
WP B04-20	Money Market Pressure and the Determinants of Banking Crises (Jürgen von Hagen and Tai-kuang Ho)
WP B04-21	The effectiveness of subsidies revisited: accounting for wage and employment effects in business R&D (Volker Reinthaler and Guntram B. Wolff)
WP B04-22	Non-Discretionary Monetary Policy: The Answer for Transition Economies? (Elham Mafi-Kreft and Steven F. Kreft)
WP B04-23	Which Lender of Last Resort for the Eurosystem? (Otto Steiger)
WP B04-24	The Endogeneity of Money and the Eurosystem (Otto Steiger)
WP B04-25	Exchange Rate Risk and Convergence to the Euro (Lucjan T. Orlowski)
WP B04-26	Analyzing Trade Opening in Ukraine: Effects of a Customs Union with the EU (Oksana Harbuzuk and Stefan Lutz)
WP B04-27	Firm Performance and Privatization in Ukraine (Galyna Grygorenko and Stefan Lutz)
WP B04-28	Fiscal Crises in U.S. Cities: Structural and Non-structural Causes (Guntram B. Wolff)
WP B04-29	Deutschlands Wirtschaft, seine Schulden und die Unzulänglichkeiten der einheitlichen Geldpolitik im Eurosystem (Dieter Spethmann and Otto Steiger)
PP B04-30	Der Vollzug von Gemeinschaftsrecht über die Mitgliedstaaten und seine Rolle für die EU und den Beitrittsprozeß (Martin Seidel)
WP B04-31	Fear of Floating and Fear of Pegging: An Empirical Analysis of De Facto Exchange Rate Regimes in Developing Countries (Jizhong Zhou and Jürgen von Hagen)
WP B04-32	The Choice of Exchange Rate Regimes in Developing Countries: A Multinomial Panel Analysis (Jürgen von Hagen and Jizhong Zhou)