

WORKING PAPER 129

ARE MONETARY RULES AND REFORMS
COMPLEMENTS OR SUBSTITUTES?
A PANEL ANALYSIS FOR THE WORLD
VERSUS OECD COUNTRIES

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Imprint: Responsibility according to Austrian media law: Guenther Thonabauer, Secretariat of the Board of Executive Directors, Oesterreichische Nationalbank

Published and printed by Oesterreichische Nationalbank, Wien.

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Editorial

This paper investigates the relationship between the exchange rate regime and the degree of structural reforms using panel data techniques. The authors look at a broad sample of countries (the “world sample”) and also an OECD sample. The main findings suggest that adopting a fixed exchange rate rule is positively correlated with the degree of over-all structural reforms and the trade component. The paper also highlights the fact that considering a heterogeneous panel of countries as opposed to a limited does not matter for these results.

July 6, 2006

Are Monetary Rules and Reforms Complements or Substitutes? A Panel Analysis for the World versus OECD Countries

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original version August 3rd, 2005, revised version April 27th, 2006

Abstract

This paper investigates the relationship between the exchange rate regime and the degree of structural reforms using panel data techniques. We look at a broad sample of countries (the “world sample”) and also an OECD sample. Our main findings suggest that adopting a fixed exchange rate rule is positively correlated with the degree of overall structural reforms and the trade component. The paper also highlights the fact that considering a heterogeneous panel of countries as opposed to a limited does not matter for this results.

JEL Classifications: D78, E52, E61

Keywords: exchange rates, monetary policy regime, liberalisation, panel data, political economy of reform.

Acknowledgements: We would like to thank two anonymous referees and Eduard Hochreiter for helpful comments and suggestions on an earlier version of this paper. We gratefully acknowledge the hospitality of the Oesterreichische Nationalbank (OeNB) where the first author was a visiting researcher while parts of this paper were written. For delivery of data we are grateful to Stefan Pitlik and Andreas Freytag.

1. Introduction

Solving the pressing problem of unemployment by means of reforms and the choice of the appropriate monetary policy strategy are crucial challenges in current academic and political debates. Although both issues are usually connected in the public, the academic discussion had neglected, until the mid-nineties, to provide rational arguments for such an interrelation. Until then, the incentives and disincentives for labor, product and financial market reforms and liberalization on the one side and the benefits and costs of monetary policy rules on the other side had typically been analyzed in isolation. Hence, in the absence of a unified approach it is not possible to analyze whether monetary rules and reforms are complements or substitutes.

However, the first-best solution to solve the problem of high unemployment is to remove labor market rigidities, the fundamental cause of high structural unemployment (Svensson, 1997: 104, 109; Duval and Elmeskov, 2005: 5).¹ Yet, such a proposal could be regarded as rather naive from a public choice perspective which emphasizes that labor market institutions, as an outcome of rational political choice, have to be implemented in the loss function of politicians. In this paper, we argue that the design of labor market institutions can be interpreted as the result of utility maximizing political decisions who have to see whether monetary rules and reforms are complements or substitutes.

Cross-country event studies are one approach to empirically examine the relationship between monetary policy strategies and the degree of economic reform. This approach has severe limitations, however. The U.S., e.g., are a monetary union with labor market institutions that encourage a low natural rate of unemployment. The EMS commitment

was extremely helpful in fostering the reform process in the Netherlands and Denmark. The same holds for Austria under the DM peg (Hochreiter and Tavlas, 2005). In contrast, the U.K. and New Zealand experienced extensive labor market reforms without adhering to an international exchange rate arrangement. Hence, we choose an econometric analysis for a large sample of countries. Thereby, we go beyond the EMU case studies by van Poeck and Borghijs (2001), Bertola and Boeri (2001), and IMF (2004) which are rare examples of empirical investigations in this field.²

It is important to note that we are not interested in a causal relationship between the choice of monetary rules and the degree of reforms. The approach we use in the paper is to see if the two are complements or substitutes. Moreover, the theoretical derivations in the literature are based on monetary rules in general, but the specific monetary rule we will be focusing on is exchange rate rules.

The remainder of the paper is structured as follows. Section 2 discusses the main arguments concerning the relationship between monetary policy autonomy and structural reforms in open economies. In section 3 we extend our analysis to the open economy case and derive testable hypotheses concerning the question whether exchange rate rules and reforms are complements or substitutes. Panel estimates on the relationship between the exchange rate regime and the degree of reforms are presented in section 4. The regressions include a set of additional variables and a number of robustness checks. Section 5 concludes.

2. Theory: Conflicting views on the relationship between monetary rules and the degree of reforms

The discussion of the relation between the degree of monetary policy autonomy and structural reforms is characterized by a wide spectrum of conflicting views. We start with a sketch of the literature on monetary policy autonomy and reforms and refer to a prominent example of the loss of monetary autonomy, i.e. the irrevocable fixing of exchange rates under European Monetary Union (EMU). In the run-up to EMU a number of studies tried to assess the incentive effects of alternative monetary policy strategies on labor market reforms.

According to the proponents of a liberal view, EMU, as a classical variant of a rule-based monetary policy, should have a disciplinary impact on national labor markets.³ In the first place, EMU enhances the credibility of monetary policy and thereby lowers inflation expectations. Negative employment effects as a result of (too) high wage claims can no longer be accommodated by discretionary monetary policy. The responsibility of wage setters for unemployment increases significantly, because they no longer negotiate about nominal wage but *real* wage growth. The responsibility for existing unemployment is more transparently assigned to the parties which negotiate the relative price of labor. In contrast, autonomous discretionary monetary policy makes it more difficult to remove market rigidities because there is still the option to solve or at least to shift the unemployment problem onto third parties. i.e. to *an expansionary monetary policy*.

Insofar as the single currency increases transparency, the costs of structural rigidities, as reflected in relative prices, become more evident. Lower trading costs and higher transparency jointly tend to foster competition in goods markets, which in turn reduces the

available product market rents. If these rents are smaller, the incentive to resist reforms that prevent such rents to be captured are smaller as well.

Overall, the incentives for extensive reforms of goods, labor, and capital markets increase under a regime of irrevocably fixed exchange rates.⁴ If changes in monetary policy and the nominal exchange rate are not available, and if labor is immobile as is the case in most parts of the Euro area, there is no other option than to undertake reforms in order to facilitate the market-based adjustment to shocks. Hence, credible currency pegging has often been interpreted as a version of Mrs. Thatcher's *There-Is-No-Alternative* (TINA) strategy.⁵ In this paper, we intend to generalize this striking TINA argument empirically and extend it to countries beyond the narrow focus of the Euro area, which is what e.g. Duval and Elmeskov (2005) concentrate on.

However, there are also important arguments against a positive impact of monetary rules on economic reform. First, based on OECD macro model simulations it was often argued with respect to EMU that the so-called up-front costs of structural reforms may be larger within a currency union. This holds especially in large, relatively closed countries for which changes in the real exchange rate are not so effective in alleviating the necessary "crowding-in" effect. Removing restrictions in financial markets tend to stimulate demand more than labor market reforms and hence allow an easier and quicker "crowding-in" of reforms (Bean, 1998, Duval and Elmeskov, 2005: 10-12, Saint-Paul and Bentolila, 2000). Hence, the prior in this case would be that rule-based monetary policy regimes like, e.g., EMU, lead to more reforms in the financial market than in the labor market.

Second, Calmfors (1997) and Sibert and Sutherland (1997) argue that one should not expect from monetary policy with its mainly short-run real economy effects to diminish structural unemployment significantly. Hence, rule-based monetary policy does not necessarily imply more reform pressure. In the same line, empirical analysis indicates that the capability of exchange rates to absorb asymmetric shocks to labor and goods markets is rather low. Hence, flexibility of exchange rates does not seem to be a good substitute for reforms and, hence, the degree of reforms is not necessarily higher under fixed exchange rates (Belke and Gros, 1999).

Third, some analysts support the view that rule-based monetary policy, at least if it takes effect through entering a fixed exchange rate regime, has no disciplinary effects on the wage setting process, but leads to centralization processes and strengthens the incentives to claim high wages on the part of unions. Fourth, the limited evidence of price structure convergence for instance among core-EMS countries as compared with other countries speaks against any significant impact of credible exchange rate stabilization on product market competition. Hence, there are still product market rents to be captured and there will still be resistance to reforms (Haffner et al., 2000).

Finally, one should also mention that fixed exchange rate rules as a special case of monetary rules eliminate the exchange rate risk, which attracts more capital. Having access to more foreign capital might reduce the incentive to undertake financial market reforms. In this sense, fixed exchange rates tend to lower the degree of reforms as well.

From these introductory remarks it should be clear that the implementation of specific monetary policy rules for instance by EMU significantly changes the conditions for and the efficiency of structural reforms. The usual result of this strand of literature is that

under EMU which can be interpreted as a monetary rule from the perspective of the individual member countries there will be a lower degree of reforms than under autonomous monetary policy outside EMU monetary rules where reforms reduce both unemployment and an inflation bias. In contrast, rule-based monetary policy inside EMU limits the benefits of reforms to a positive impact on employment. Expressed more generally, the degree of reforms is therefore higher in the case of autonomous policy (discretion) and lower in the case of commitment (Calmfors, 1997, 1998; Gruener and Heffeker, 1996).

If monetary policy is autonomous, market-oriented reforms seem to achieve a 'double dividend' since monetary policy is discretionary. First, the reforms reduce –like a rule-based monetary policy – the costs of structural unemployment. Secondly, they lessen equilibrium inflation since they diminish the credibility problem of discretionary monetary policy. The second effect is absent in the case of rule-based monetary policy. By definition rule-based monetary policy does not suffer from a credibility problem. Hence, our central question relates to the correlation between reform intensity and the degree of autonomy of monetary policy, which might be determined to a large degree by the exchange rate regime, at least if the country is small and open (Duval and Elmeskov, 2005: 9 and 23 ff.). We focus on the notion of monetary policy autonomy instead of discretion since we consider autonomy as an important prerequisite of discretionary monetary policy. In this respect, our approach strictly follows Duval and Elmeskov (2005: 25) who measure the loss of autonomy of monetary policy by the degree of participation in any kind of fixed exchange rate agreement.

3 Extension to the open economy case

Economic openness generally relates to the share of exports and imports in GDP. A stronger exposure of firms to international competition is often assumed to increase the pressure and the incentives for market-oriented reforms. In open economies, output and employment tend to be highly responsive to price competitiveness and, hence, incentives to undertake reforms are large (see, e.g., Katzenstein, 1985, and Nickell, 2005: 2-3). However, empirical evidence is not especially supportive of the view that open economies are more likely to liberalize. Although Pitlik and Wirth (2003) report a positive impact of economic openness on market-oriented reforms, Herz and Vogel (2005) and Pitlik (2004) do not find robust significant coefficients of economic openness for their summary indicator. Only the trade policy indicator points to a positive effect of economic openness on liberalization. Similarly, the constitutional requirements of political decision-making influence the feasibility of policy changes. However, our theoretical section 2 indicates a possible solution to this empirical puzzle. The key insight borrowed, for instance, from the political economy literature on openness, size of governments and reform efforts (Rodrik, 1996, and numerous other papers by this author) is that more open economies are more likely to implement rule-based exchange rate stabilization and, hence, generally implement less reforms.

Table 1 illustrates the empirical relation between economic openness and exchange rate policy. Exchange rate flexibility is measured on a scale from 1 (hard peg) to 4 (free float). The average and median statistics indicate that less open economies tend to have relatively flexible exchange rate regimes, whereas very open economies tend to favor currency fixes.

- Table 1 about here -

We continue to assume that the main aim of reforms is to lower structural unemployment, but use the term monetary policy rule in a more general fashion, i.e. that it comprises both monetary and exchange rate policy. Following this notation, we equate the case of flexible exchange rates with the case of autonomous and discretionary monetary policy and use the notion of a fixed exchange rate system in cases which we originally addressed as rule-based monetary policy. But is this generalization legitimate, i.e. to interpret our model in terms of exchange rate regimes instead of monetary policy regimes?

As a stylized fact, the amount of money in an open economy is not determined autonomously by the central bank but is determined endogenously by the exchange rate regime (see, e.g., Annett, 1993: 25; Krugman and Obstfeld, 2003, chapters 16 and 17). From early political business cycle research it is well-known that especially in the case of small open economies there is little evidence of rational partisan cycles (rational partisan theory RPT), i.e. high and increasing inflation rates under left-wing governments and low and diminishing inflation rates under right-wing regimes.⁶ In the standard literature, the failure to establish partisan cycles is generally traced back to the fact that small open economies tend to have fixed exchange rates and, hence, the ability of these countries to exert an ideologically motivated impact on the inflation rate is limited.⁷ If the limited degree of monetary policy autonomy under fixed exchange rates is raised by choosing a flexible exchange rate regime, there is more scope for partisan-oriented monetary policies. Wage negotiating parties tend to anticipate and account for different preferences of political parties only if exchange rates are flexible. Only in this case, incumbent governments are able to manipulate the inflation rate by monetary and ex-

change rate policies. Hence, higher inflation rates under left-wing governments induced by a dynamic inconsistency problem can only arise, if exchange rates are flexible.⁸

A second argument underpins this view. Assume the existence of an international business cycle. In more open economies partisan considerations that arise at the domestic level are more likely to affect policymakers' incentives to engage in international cooperation. Left-wing governments cannot credibly commit themselves to international cooperation and prefer beggar-thy-neighbor policies so that the inflation bias of left-wing governments even increases in open economies. International cooperation, e.g., by fixed exchange rate arrangements, tends to eliminate the inflation bias via the same mechanism (Lohmann, 1993: 1374 ff.). The final argument in favor of our approach is that the hypothesis of a loss of monetary autonomy under fixed exchange rates rests on the assumption of perfect international capital mobility. This mobility has increased since the start of the 1970s, the beginning of the time period investigated in this paper.

Empirical studies of the rational partisan theory clearly show that - assuming a monetary model of the exchange rate - party-specific trajectories of money growth and inflation rates go along with proportional movements of the exchange rate. For instance, left-wing governments are more likely to experience inflation, capital flight, current account deficits and currency devaluation.⁹ Hence, we feel justified to equate a flexible exchange rate system with a regime of autonomous and discretionary monetary policy and a system of fixed exchange rates with a rule-based monetary policy regime. From this point of view, our previous arguments that have been elaborated for the concepts 'rule-based versus discretionary monetary policy' can be transferred to those of 'fixed versus flexible exchange rate systems' and can be tested empirically in a straightforward fashion.

4. Empirical analysis

4.1 Hypotheses

In general, we now ask whether a significant positive correlation between exchange rate flexibility and market liberalization results if the usual impact factors like the macro economic environment or political and institutional impediments to economic reforms are controlled for. Hence, we test for a significant coefficient of our measure of exchange rate flexibility in regressions using reform indices as the dependent variable and check for robustness of the results. In accordance with section 2, the following hypotheses are expected to hold:

- (1) If the view of an excessive intensity of reforms under monetary policy autonomy is correct, the degree of reforms will be higher for more flexible exchange rates and exchange rate rules and reforms are substitutes, net of other factors.
- (2) However, if the TINA-view of exchange rate fixing as a structural whip and, hence, of complementarity between exchange rate rules and reforms is valid, one should expect the contrary, namely a negative correlation of exchange rate flexibility with the degree of reforms, net of other factors.
- (3) If third factors like the initial need for reforms, the so-called problem pressure, dominate the relationship, the exchange rate regime should turn out to be less significant.

Note that (1) to (3) should be valid not only for labor market reforms but also for complementary structural reforms in the goods and the financial markets.

4.2 Data and Definitions

We estimate and test the conjectured correlation of the exchange rate regime with the degree of market-oriented reforms based on a panel of 178 countries and a more homogeneous panel of 23 OECD economies.¹⁰ Our samples cover the period 1970 to 2000 in order to exploit all available data information. In line with our theoretical model, our empirical analysis focuses on the pattern of the correlation of the exchange rate regime with the degree of market-oriented reforms.

As dependent variable we use the extent of economic liberalization as measured by the Economic Freedom of the World (EFW) index and the sub-indices *money and banking system*, *government size*, *labor market*, *credit and business regulation* and *impediments to international trade*, respectively (Gwartney and Lawson 2003, Gwartney et al. 2003). These indices range from one to ten, with a high value corresponding to a high level of economic freedom. A positive change of the index therefore indicates market-oriented reforms. The EFW index and the sub-indices are available in five-year intervals over the period 1970-2000.¹¹ Hence, we focus on a wider policy reform data base than Duval and Elmeskov (2005), who investigate data from five key policy areas: unemployment benefit systems, labor taxes, employment protection legislation, product market regulation and retirement schemes.

Among the explaining variables, our discussion focuses on the measure of exchange rate flexibility. In section 2, we argued that we prefer to measure the loss of autonomy of monetary policy by the degree of participation in any kind of fixed exchange rate agreement. This approach allows to exploit a wider cross-country / time-series dataset of structural reforms than would otherwise be possible. As a result, we feel justified to apply an econometric analysis of reform determinants which includes the degree of ex-

change rate flexibility as one of the explanatory variables. However, one obvious drawback of our analysis is that it does not cover some of the idiosyncratic characteristics of currency unions compared with other fixed exchange-rate arrangements. In particular, the EMU example reveals that the adoption of a single currency makes the TINA argument emphasized in section 2 more compelling than in the case of other, less irreversible exchange-rate regimes. With an eye on these arguments, we decided to employ the Reinhart and Rogoff (2002) index of *de facto* exchange rate arrangements.¹² Reinhart and Rogoff (2002) distinguish between exchange rate pegs (1), limited flexibility (2), managed floating (3), and freely floating (4).¹³ Thus, the higher the index value the higher is the *de facto* flexibility of exchange rates. For our purpose and due to the time structure of the EFW data, we average the Reinhart and Rogoff (2002) index values over five-year intervals.

The additional control variables that we consider include inflation, economic growth, openness and the log of real per-capita GDP as proxies of the pressure to reform. Data are available from the World Development Indicators database (World Bank, 2002). Economic openness is defined as exports plus imports relative to GDP. To account for the potential endogeneity and in accordance with other contributions (e.g., Herz and Vogel, 2005; Pitlik 2004; Pitlik and Wirth, 2003; Lora 2000), we take these variables in first lags. Since we introduce the four proxies of reform pressure in lagged form, we are controlling for endogeneity, but at the same time we are also testing for Granger-causality. Hence, the results gained in the empirical analysis can also be read in this framework.

A final set of controls accounts for political and institutional barriers to policy reforms. Here we include POLCON5 and the number of government changes. POLCON5

(Henisz, 2000, 2002) measures the effective political restrictions on executive behavior. It accounts for the veto powers of the executive, two legislative chambers, the sub-national entities and an independent judiciary. The index ranges from zero to one, where a higher value indicates stronger political constraints on the government. Given the time structure of our dependent variable, we take average values of POLCON5 for the respective five-year interval. GOVCHANGES counts the number of government changes that entail a significant programmatic reorientation. The data are taken from Beck et al. (2001). The credibility and reliability of economic policy is assumed to decrease with the number of government changes. Frequent changes shorten the administration's time horizon and lead to a stronger discounting of positive future payoffs from reforms.

4.3 Empirical model and results

4.3.1 Empirical model

To investigate the empirical relationship of (a) the exchange rate regime and the political and institutional characteristics and (b) reforms, we estimate the equation

$$\Delta EFW_{it} = \alpha_0 + \alpha_1 EFW_{i,t-1} + \alpha_2 EXR_{it} + \alpha_3' X_{i,t-1} + \alpha_4' Y_{it} + \eta_i + \lambda_t + \varepsilon_{it},$$

where ΔEFW represents our index of reforms, i.e. the change in economic freedom. EXR is our measure for exchange rate flexibility, X is the vector of macroeconomic variables (growth, inflation, openness, per-capita GDP), Y captures the political and institutional determinants of the capacity to reform, and i is a country index. Most importantly, we expect $\alpha_2 > 0$ to hold, if a high degree of exchange rate flexibility leads to more reforms (see section 2). However, if the TINA-view is valid, one should expect the contrary, namely $\alpha_2 < 0$. To account for unobserved heterogeneity across countries and across time, we add individual-specific (η_i) and time-specific effects (λ_t).

The lagged dependent variable figures among the regressors in our empirical model. This leads OLS estimates of the coefficients to be biased (see e.g. Baltagi, 1995; Hsiao, 2003). We therefore estimate our dynamic equation with the GMM difference estimator of Arellano and Bond (1991) and report the one-step estimates in tables 2 to 6. To check the robustness of the results we also apply the GMM system estimator of Arellano and Bover (1995) and Blundell and Bond (1998). Here we report the two-step estimates, which correct for the downward bias in one-step standard errors (see Windmeijer 2000).

4.3.2 Results

This section presents the regression results for our broad country sample and for the sample of high-income OECD economies, respectively. We report the regression results for *overall liberalization, money and banking system, government size, market regulation* and *impediments to international trade* as dependent variables. Tables 2 to 6 display the GMM estimates for each of the indicators of economic liberalization.

- Table 2 about here -

A robust result, which is strongly significant in the large majority of the regressions, is the negative impact of the initial level of economic freedom on the extent of subsequent market-oriented reforms. The higher the initial level of economic freedom, the lower are the scope and the need for further liberalization. The negative coefficient values also indicate a conditional convergence in economic policy (Duval and Elmeskov, 2005: 23 ff.). The main interest of our paper lies on the correlation of the exchange rate system with market-oriented reforms, however. Here, we find a robust negative impact of higher exchange rate flexibility on overall liberalization, as measured by the chain-linked EFW index, in our world-wide sample. This result of complementarity between exchange rate rules and reforms also carries over to the sub-sample of OECD econo-

mies. For *trade liberalization* we also obtain a negatively significant correlation between exchange rate flexibility and economic reform for both the world-wide and the OECD country sample. The result is compatible with the idea that the exchange-rate peg can be a complementary measure to facilitate cross-boarder exchanges and to reap the gains from international trade. Furthermore, the GMM system estimates in table 3 provide some evidence for a the complementarity between exchange rate commitment and *money and banking sector* reform.

- Tables 3 and 4 about here -

The exchange-rate variable is insignificant in our regressions for *government-sector reform* and *labor market, credit and business regulation*. Hence, the estimates provide no empirical evidence for a relationship between the adoption of an exchange rate rule and the extend of structural reforms in this important fields of economic policy. None of our estimates provides evidence for the hypothesis (1) and the idea that exchange rate rules and structural reforms might be substitutes, net of other factors.

- Table 5 about here -

How can we reconcile the negative coefficient values for the overall index, on the one hand, and the insignificance of the exchange rate indicator for the sub-indices *government size* and *market regulation*, on the other hand? One candidate explanation is that the positive complementarity between fixed exchange rates and market-oriented reforms is entirely driven by the positive correlation between the exchange rate commitment and the liberalization of trade and to a certain extend also by the complementarity between the exchange rate commitment and *money and banking sector* reform. The positive correlation between the exchange rate commitment and trade liberalization coincides with the view of the exchange rate fix as an instrument to facilitate international trade and to

reap the full benefits of economic integration. Indeed, the complementarity between trade and exchange rate commitment was a prominent argument in the context and in favor of European Monetary Union (e.g. Emerson et al. 1992). The complementarity between the exchange rate commitment and *money and banking sector* reform can be related to the positive impact of the exchange rate commitment on price stability and the credibility of monetary policy. Low inflation is itself an important component of the reform sub-indicator. A sound banking system should strengthen the credibility and lower the risk of exchange rate crises.

A second point to keep in mind is that, contrary to the overall indicator, the indices for *trade, money and banking, government size* and *market regulation* are not chain-linked. Missing data in the construction of these indicators may therefore distort their values. The latter will then distort the results and diminish the accuracy with which the extend of reforms is measured.

- Table 6 about here -

Taken together, the finding of no positive correlation between exchange rate flexibility and structural reforms contradict the hypothesis that the exchange rate commitment and reforms are substitutes. Instead, the negative correlation between exchange rate flexibility and overall reform as well as *trade* liberalization and *money and banking sector* reform points to a complementarity of the exchange rate commitment and structural reforms. The exchange rate indicator is insignificant for *government sector* reform and *market regulation*, indicating that the exchange rate regime plays no role for these areas of structural reform. Note however that the non-chainlinked nature of our sub-indicator data may bias our results in the direction of finding no significant relationship.

Concerning the other control variables, we find a significant negative impact of the initial level of economic freedom on subsequent reforms, except for government sector reform in the OECD. For the world sample we furthermore find a positive impact of political constraints and a negative impact of government instability on overall liberalization, *government size* and *money and banking sector* reform. Political constraints appear to favor trade liberalization in the broad sample as well as within the OECD.

The macroeconomic control variables play only a limited role in our regressions. High inflation and economic growth both have a robust and positive impact on *money and banking sector* reform in the world sample, but not in the high-income OECD economies. Within the world sample a ten percentage-point higher inflation is associated with an additional 0.01-point index improvement. Also openness seems to have a positive impact on *money and banking sector* reform in the broad country sample. The negative impact of initial per-capita income on overall liberalization and on *money and banking sector* reform in the world sample is not robust across the estimators, as is the negative impact of growth and openness on *trade* liberalization and the negative impact of openness on *government sector* reform. GMM in differences gives a negatively significant coefficient for openness and initial income levels on overall liberalization and *regulatory* reform, and a negative impact on openness on *government sector* reform for OECD countries. Although the later result coincides with the hypothesis that small open economies have bigger governments (e.g. Rodrik 1998), GMM system estimator does not confirm its significance.

Since we control for the endogeneity of our four proxies of reform pressure by introducing them as lagged values we are also testing for Granger-causality. Inflation, economic growth and openness are not robustly significant in many of our specifications. Hence,

they do not appear to Granger-cause economic freedom. The only notable exception is the robust positive impact of inflation, growth and openness on *money and banking sector* reform in the world-wide sample. A detailed discussion of similar results in a different model context can be found in Herz and Vogel (2005) and Pitlik (2004).

4.3.3 Robustness Checks

As already mentioned we have checked the robustness of our results by applying both the GMM difference and the GMM system estimator to our dynamic panel equation. The complementarity of the exchange rate commitment and structural reforms for overall liberalization and *trade* liberalization is robust across both estimators, as is the insignificant exchange-rate coefficient in the regressions for *government-sector* and market *regulatory* reform. The only differences appear for *government sector* reform in the OECD and *money and banking sector* reform in the world sample. None of the estimators suggests a positive relationship between exchange rate flexibility and structural reform, however.

A second robustness check relates to the heterogeneity in the world sample of 178 economies. The countries included in the sample differ a lot with respect to their economical, political and institutional conditions. The OECD economies present a much more homogenous sub-sample. To check the robustness of our broad-sample estimates we rerun the regressions for another data set where we excluded all countries with less than one million inhabitants. This way, we should reduce the noise introduced by very small and “atypical” political entities. We drop the 45 countries and end up with a sample of 133 economies. The estimates for the reduced sample are presented in columns 3 and 4 of tables 2 to 6. They are very similar to the full 178-country sample. Most impor-

tantly, they reach exactly the same conclusions on the relationship between the exchange rate regime and structural reforms as the full world sample. Furthermore, the introduction of lagged per-capita income and economic openness in our regression already accounts for important sources of structural heterogeneity within our broad country sample

5. Conclusions

In this paper, we investigated the relationship between the exchange rate regime and the degree of structural reforms using panel data techniques. We looked at a broad sample of countries (the “world sample”) and also an OECD sample. Our main findings suggest that adopting a fixed exchange rate rule is positively correlated with the degree of overall structural reforms and trade liberalization in both the world and the OECD country sample. The positive correlation money and banking sector reform in the world sample is not robust.

As dependent variable we used the degree of market-oriented reforms. As independent variables we included indicators of the flexibility of the exchange rate system, the stability of monetary policy and further control variables like economic performance as a proxy of reform pressure and institutional impediments to further reform. The results of our empirical analysis suggest that the adoption of an exchange rate rule is positively correlated with market-oriented reforms, and with reforms in trade policy in particular. From this point of view, monetary, i.e. exchange rate, rules and reforms are complements and not substitutes. The complementarity result for money and banking sector reform in the world sample is not robust. For the government sector and for market regulation, we do not find any significant effect. We find no empirical evidence for a

positive correlation between exchange rate flexibility and the amount of structural reforms, however.

Seen on the whole, these results do not confirm that exchange rate rules and the degree of reforms are substitutes, i.e. a higher if not excessive degree of reforms under monetary policy autonomy. In contrast, some of the estimates support the TINA argument that exchange rate rules and the degree of reforms are complements, i.e. limiting monetary policy autonomy by an exchange rate rule tends to raise the probability of the implementation of structural reforms / liberalisation steps. In these cases, the elimination of the exchange rate option seems to extend the incentives for painful but long-term beneficial institutional adjustments on labor and product markets for developing countries and emerging markets. However, with an eye on the mixed character of the overall empirical results, one should be quite careful about generally linking the results gained here to the potential choice of an exchange rate regime for emerging countries at this stage of analysis.

Finally, the exchange rate regime turned out to be insignificant when we applied it to *government sector* and *regulatory* reforms. Instead, the usual suspects like problem pressure as measured by the initial degree of freedom dominate these regressions. In a sense, one could even argue that a change in a nominal variable like for instance the exchange rate regime, appears to have mainly effects on other nominal variables like the monetary and banking system, a view often condemned as too pessimistic in the discussions during the run-up to the Euro. From this perspective, our results are strikingly similar to the huge amount of non-results which Duval and Elmeskov (2005) found for their sample of EMU countries. Hence, the upshot of our study is that one should not exaggerate the complementarity of monetary policy rules in the form of exchange rate

rules and economic freedom in view of a large status-quo bias and path-dependence of reform intensity. However, there is no empirical base at all for the argument that discretionary monetary policy is favorable because it gives more incentives for structural reforms. In other words, we have to clearly reject the hypothesis that exchange rate rules and reforms are substitutes. This insight probably represents the most robust result of this contribution.

Endnotes

- ¹ OECD (2005) applies a consistent procedure to derive policy priorities to foster growth across OECD countries and identifies labor market reforms as being particularly important in, e.g., the Euro area. However, this does not at all imply that reforms in other areas are unimportant. Hence, we analyze a variety of different reform measures in the empirical part of the paper.
- ² Van Poeck and Borghijs (2001) argue that the prospect of qualifying for EMU should provide as big an incentive for labor-market reform as EMU membership itself. They conclude that EMU countries did not reform more than other countries and, unlike elsewhere, their progress on reform seemed unrelated to the initial level of unemployment. For a period from the early nineties up to 1999, Bertola and Boeri (2001), they only focus cash transfers to people of working age, e.g. unemployment benefits, and on job protection. They arrive at exactly opposite conclusions, i.e. reforms accelerated more in the euro area than outside. The IMF (2004) looks at the impact of a range of factors including macroeconomic conditions, political institutions, reform design and variables aimed to capture attitudes towards structural reform on different policy areas across OECD countries from the mid-1970s up to the late 1990s. It finds that EU membership leads to faster moves towards liberalization of

product markets. However, it does not clarify whether this represents an effect of EMU and/or policies to prepare for EMU. See also Duval and Elmeskov (2005), p. 10.

- ³ For a recent survey of the arguments see Duval and Elmeskov (2005) and Hochreiter and Tavlas (2005).
- ⁴ See Alogoskoufis (1994), Calmfors (1997), Duval and Elmeskov (2005: 6), Mélitz (1997) and Sibert and Sutherland (1997).
- ⁵ See, Bean (1998), Calmfors (1998: 28); Duval and Elmeskov (2005: 5) and Saint-Paul and Bentolila (2000).
- ⁶ Early sources are Alesina (1992: 13-14), Alesina and Roubini (1992: 680) and Annett (1993: 25 and 42).
- ⁷ See Alogoskoufis, Lockwood and Philippopoulos (1992: 1384) and Ellis and Thoma (1990: 17 and 24).
- ⁸ See Alesina and Roubini (1992: 673-674), Alogoskoufis and Philippopoulos (1992: 397), Alogoskoufis, Lockwood and Philippopoulos (1992: 1370-1371) and Annett (1993: 25 and 33).
- ⁹ See Simmons (1994: 59), Ellis and Thoma (1990) estimate rational partisan theory approaches for open economies. In their study, party-specific inflation rates lead to party specific differences in exchange rate movements.
- ¹⁰ The 23 OECD economies correspond to the category high-income industrialized countries in the World Development Indicators database (World Bank, 2002) and cover Australia, Canada, the former EU-15, Iceland, Japan, New Zealand, Norway, Switzerland and the United States.
- ¹¹ We use the chain-weighted EFW index (Gwartney et al., 2003), which corrects for the limited availability of some components over time. This chain-linked index is only available for the summary indicator, however. For the sub areas *government size* and *market regulation* we have to rely on uncorrected data.

¹² The *de facto* measure improves on the *de jure* classification of IMF (2003) since it takes into account that de jure exchange rate regimes are not necessarily applied in practice. This has especially been the case in developing countries but also in industrialized countries. Austria, e.g., had a de facto fixed exchange rate regime vis-à-vis Germany for a long time without being a formal member of the exchange rate mechanism of the EMS. See Hochreiter and Tavlas (2005).

¹³ Reinhart and Rogoff (2002) include freely falling rates as an additional category. We add the cases of freely falling rates to the free-float category, however.

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Data and Variables

Variable	Source
Economic freedom - Summary indicator - Money and banking system - Government size - Regulation	Gwartney et al. (2003)
Exchange rate regime	Reinhart and Rogoff (2002)
Monetary commitment	Freytag (2005)
Inflation	OECD (2002), World Bank (2002)
Economic growth	OECD (2002), World Bank (2002)
Economic openness (trade/ GDP)	OECD (2002), World Bank (2002)
Political constraints (POLCON5)	Henisz (2000, 2002)
Number of government changes (GOVCHANGES)	Beck et al. (2001)

Tables

Table 1. Economic openness and exchange rate regimes 1970-2000

Degree of openness (Trade/ GDP)	Average	Median	Observations
< 0.25	2.65	2.93	60
0.25-0.75	2.27	2	471
0.75-1.25	1.98	2	200
> 1.25	1.51	1	59

Sources: The data on exchange rate flexibility are taken from Reinhart and Rogoff (2002). We measure economic openness as the sum of exports plus imports relative to GDP). The data are extracted from the World Development Indicators database (World Bank 2002).

Table 2. Panel estimates for overall liberalization (t-values in parentheses, significance levels: 10% *, 5% **, 1% *)**

	World sample		Countries > 1 mio. inhabitants		OECD	
	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS
EXR flexibility	-0.13** (-2.13)	-0.15** (-2.44)	-0.14** (-2.27)	-0.17*** (-2.61)	-0.23** (-2.31)	-0.63** (-2.39)
EFW (t-1)	-0.35*** (-2.75)	-0.40*** (-5.24)	-0.33*** (-2.58)	-0.37*** (-4.93)	-0.52*** (-4.56)	-0.91** (-2.39)
Inflation (t-1)	0.02 (0.99)	0.01 (0.54)	0.02 (1.05)	0.01 (0.46)	0.39 (0.56)	-0.03 (-0.01)
Growth (t-1)	1.74 (1.20)	1.49 (1.38)	1.95 (1.21)	1.34 (1.25)	-1.20 (-0.36)	-5.74 (-0.85)
Openness (t-1)	0.32 (0.75)	0.30 (0.79)	-0.18 (-0.37)	-0.28 (-0.68)	-1.38* (-1.73)	-0.81 (-0.79)
LnRGDPpc (t-1)	-0.80*** (-3.12)	-0.01 (-0.11)	-0.83*** (-3.00)	-0.01 (-0.07)	-1.37*** (-2.86)	-1.10 (-0.72)
POLCONV	0.83*** (3.44)	1.04*** (4.29)	0.81*** (3.25)	1.10*** (3.70)	0.44 (0.53)	8.56 (1.48)
GOVCHANGES	-0.08* (-1.85)	-0.12** (-2.38)	-0.11*** (-2.78)	-0.15*** (-2.73)	-0.05 (-0.68)	0.22* (1.88)
Constant	0.07 (0.74)	2.19*** (2.88)	0.08 (0.77)	2.40*** (3.15)	0.09 (1.11)	11.9 (0.86)
Time effects	34.1***	44.6***	35.0***	36.5***	27.6***	6.57
AR (1)	-4.59***	-4.65***	-4.52***	-4.57***	-3.29***	-0.32
AR (2)	-0.42	-0.35	-0.61	-0.62	-0.37	0.61
Sargan test	17.2	87.0	17.5	80.6	26.2**	5.94
Observations	338	433	311	398	89	112

Table 3. Panel estimates for trade liberalization (t-values in parentheses, significance levels: 10% *, 5% **, 1% *)**

	World sample		Countries > 1 mio. inhabitants		OECD	
	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS
EXR flexibility	-0.24** (-2.32)	-0.24** (-2.45)	-0.26** (-2.48)	-0.24** (-2.29)	-0.35** (-2.13)	-0.18** (-0.38)
T (t-1)	-0.53*** (-5.59)	-0.59*** (-9.20)	-0.52*** (-5.00)	-0.59*** (-9.11)	-0.54*** (-3.40)	-0.91*** (-2.93)
Inflation (t-1)	0.00 (0.11)	0.03 (0.98)	0.00 (0.09)	0.02 (0.90)	-2.18 (-1.66)	-2.54 (-1.05)
Growth (t-1)	-4.94* (-1.88)	-2.89 (-1.21)	-5.65* (-1.94)	-3.36 (-1.21)	-0.62 (-0.09)	-5.46 (-0.43)
Openness (t-1)	-2.15*** (-2.76)	0.31 (0.47)	-2.45*** (-2.88)	0.56 (0.80)	-1.76 (-1.48)	-4.23** (-2.49)
LnRGDPpc (t-1)	-0.31 (-0.67)	0.22 (1.60)	-0.19 (-0.36)	0.30* (1.98)	-1.05 (-0.85)	-1.45*** (-2.78)
POLCONV	0.82** (2.02)	1.18** (2.53)	0.85** (2.03)	1.26** (2.50)	3.03* (1.85)	13.1* (1.86)
GOVCHANGES	-0.11 (-1.23)	-0.10 (-1.17)	-0.13 (-1.41)	-0.14 (-1.43)	-0.10 (-1.11)	0.06 (0.23)
Constant	0.23 (1.57)	1.61 (1.41)	0.21 (1.29)	0.86 (0.64)	0.28 (1.28)	13.4*** (2.62)
Time effects	28.7***	19.8***	25.6***	19.1***	4.94	9.98**
AR (1)	-3.67***	-3.32***	-3.54***	-3.16***	-1.64	-1.05
AR (2)	-0.22	-0.24	-0.39	-0.29	-2.36**	-0.76
Sargan test	28.7***	80.5	30.1***	74.3	21.7*	8.26
Observations	333	425	310	396	89	112

Table 4. Panel estimates for money and banking sector reform (t-values in parentheses, significance levels: 10% *, 5% **, 1% *)**

	World sample		Countries > 1 mio. inhabitants		OECD	
	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS
EXR flexibility	-0.27 (-1.52)	-0.31** (-2.21)	-0.11 (-0.64)	-0.30** (-2.17)	-0.24 (-0.79)	-0.77 (-1.01)
M (t-1)	-0.16 (-1.28)	-0.31*** (-5.31)	-0.27** (-2.02)	-0.32*** (-5.06)	-0.21 (-1.51)	-0.92** (-2.06)
Inflation (t-1)	0.12*** (2.70)	0.11*** (2.58)	0.11*** (2.65)	0.09*** (2.78)	3.30 (1.02)	-11.0 (-1.00)
Growth (t-1)	16.3*** (4.62)	10.2*** (3.81)	17.5*** (4.50)	10.9*** (3.31)	-0.89 (-0.07)	1.93 (0.06)
Openness (t-1)	3.06*** (2.73)	1.27* (1.91)	3.55*** (2.73)	0.66 (0.80)	-3.84 (-1.59)	-2.54 (-0.95)
LnRGDPpc (t-1)	-3.45*** (-5.31)	-0.21 (-0.93)	-3.77*** (-5.10)	-0.25 (-0.90)	2.25 (1.23)	-3.03 (-0.74)
POLCONV	1.41* (1.78)	1.30* (1.72)	1.41* (1.80)	1.58** (2.15)	0.31 (0.16)	1.78 (0.13)
GOVCHANGES	-0.47*** (-3.64)	-0.43*** (-2.97)	-0.48*** (-3.79)	-0.44*** (-3.19)	-0.15 (-0.65)	-0.18 (-0.29)
Constant	0.32 (1.61)	3.44** (2.01)	0.28 (1.31)	4.09* (1.96)	-0.17 (-0.52)	39.2 (1.23)
Time effects	26.9***	14.7***	29.6***	13.0**	10.1**	5.31
AR (1)	-5.26***	-5.02***	-4.77***	-4.76***	-3.23***	-0.96
AR (2)	-1.42	-1.56	-1.15	-1.60	1.84*	-0.18
Sargan test	20.8*	88.3	28.9***	80.5	25.2**	11.4
Observations	365	460	333	420	89	112

Table 5. Panel estimates for government-sector reform (t-values in parentheses, significance levels: 10% *, 5% **, 1% *)**

	World sample		Countries > 1 mio. inhabitants		OECD	
	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS
EXR flexibility	-0.07 (-0.90)	-0.13 (-1.52)	-0.07 (-0.87)	-0.14 (-1.62)	-0.25** (-1.99)	0.20 (0.34)
G (t-1)	-0.51*** (-4.36)	-0.37*** (-6.00)	-0.56*** (-4.68)	-0.36*** (-4.65)	-0.38 (-0.28)	-0.34 (-0.90)
Inflation (t-1)	0.01 (0.33)	0.02 (0.36)	0.01 (0.35)	0.02 (0.52)	1.51 (1.36)	-3.70 (-0.44)
Growth (t-1)	-0.82 (-0.44)	-1.80 (-0.75)	-0.81 (-0.41)	0.35 (0.12)	-3.41 (-0.51)	2.13 (0.13)
Openness (t-1)	1.11* (1.83)	-0.44 (-0.91)	1.41* (1.87)	-0.58 (-0.93)	-2.98* (-1.72)	-2.44 (-0.80)
LnRGDPpc (t-1)	-0.17 (-0.42)	-0.17 (-0.99)	-0.29 (-0.68)	-0.21 (-1.00)	-1.89 (-1.22)	-0.45 (-0.11)
POLCONV	0.68* (1.90)	0.90** (2.52)	0.56 (1.55)	0.85** (2.20)	-0.38 (-0.28)	-0.65 (-0.11)
GOVCHANGES	-0.14** (-2.05)	-0.13 (-1.60)	-0.18*** (-2.66)	-0.14* (-1.70)	-0.14** (-2.23)	-0.33* (-1.95)
Constant	0.21 (1.48)	3.25** (2.44)	0.11 (0.76)	3.67** (2.25)	0.50*** (2.79)	7.62 (0.22)
Time effects	25.5***	41.0***	30.7***	31.1***	8.83*	5.53
AR (1)	-4.01***	-3.28***	-3.45***	-2.96***	-1.44	-1.04
AR (2)	0.36	0.74	0.41	0.72	-1.21	-1.81*
Sargan test	12.6	83.3	17.4	78.6	17.2	11.9
Observations	361	456	331	418	89	112

Table 6. Panel estimates for market liberalization (t-values in parentheses, significance levels: 10% *, 5% **, 1% *)**

	World sample		Countries > 1 mio. inhabitants		OECD	
	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS	GMM-DIFF	GMM-SYS
EXR flexibility	0.06 (0.71)	0.00 (0.04)	0.06 (0.67)	0.01 (0.11)	0.00 (0.03)	0.18 (0.61)
R (t-1)	-0.31** (-2.03)	-0.43*** (-5.42)	-0.26 (-1.54)	-0.42*** (-5.54)	-1.62*** (-9.72)	-0.89* (-1.78)
Inflation (t-1)	0.09*** (3.25)	0.05 (1.31)	0.09*** (3.21)	0.06 (1.53)	-1.09 (-1.52)	3.38 (1.08)
Growth (t-1)	0.35 (0.23)	1.61 (1.06)	-0.34 (-0.22)	0.50 (0.31)	-3.85 (-1.03)	-4.43 (-0.42)
Openness (t-1)	0.63 (1.25)	0.10 (0.25)	0.78 (1.41)	-0.01 (-0.02)	-2.35*** (-2.74)	-0.25 (-0.11)
LnRGDPpc (t-1)	-0.25 (-0.71)	0.14 (1.20)	-0.22 (-0.57)	0.19* (1.73)	-1.75* (1.71)	3.12 (1.00)
POLCONV	0.24 (0.75)	-0.04 (-0.12)	0.12 (0.35)	-0.09 (-0.25)	-1.45 (-1.66)	-2.58 (-0.26)
GOVCHANGES	-0.03 (-0.62)	-0.09 (-1.56)	-0.05 (-0.87)	-0.11* (-1.87)	0.07* (1.67)	-0.07 (-0.30)
Constant	0.32 (1.61)	1.09 (1.32)	-0.06 (-0.69)	0.73 (0.97)	0.49*** (3.75)	-23.1 (-1.11)
Time effects	80.8***	71.6***	71.8***	79.9***	152.7***	48.1***
AR (1)	-4.33***	-4.60***	-3.89***	-4.62***	1.41	-0.27
AR (2)	-1.04	-1.56	-1.25	-1.64	-0.23	-0.50
Sargan test	18.8	80.3	16.3	71.9	8.23	11.1
Observations	314	408	291	378	89	112

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