The Political Economy of Exchange Rate Regime Duration:

A Survival Analysis

by Ralph Setzer[1]

Abstract

This paper examines the role that political, institutional and economic factors played in exchange rate regime duration in 49 developing countries within the time period 1974-2000. Set in the framework of survival analysis, I characterize and model the times to exit for a fixed exchange rate regime using a Cox model. The empirical analysis shows that exchange rate regime choice is not a purely theoretical issue, but strongly depends on partisan and institutional incentives such as the political color of the government in power, the number of veto players and the degree of central bank independence.

JEL classification: E61, F31, F33

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1. Introduction

There is an extensive theoretical and empirical literature on the optimal exchange rate arrangement for developing countries. Economists focused for most of the time on the possible influence of optimal currency area (OCA) criteria such as trade openness or factor mobility. These factors indeed have turned out to be crucial. However, structural variables of the OCA approach cannot explain why among economies with similar economic structure, large differences in exchange rate policy have been observed. More recent studies on the determinants of exchange rate regime choice have therefore directed their attention to the impact of domestic and institutional factors. Activated by a growing body of scholarship that describes economic outcomes as influenced by government institutions, a number of economists have claimed that electoral, partisan and institutional incentives have a significant impact on exchange rate policy (see, e.g., Bernhard and Leblang 1999, Frieden, Ghezzi, and Stein 2001). These authors argue that exchange rate policy is the outcome of a political process with strong distributional and welfare implications. In this view, differences in exchange rate policy can be explained by factors such as different parties having different macroeconomic preferences, incumbents' efforts to increase their reelection prospects, or by interest groups that lobby for strong or weak currencies. The aim of this paper is to expand the present literature on the political economy of exchange rate regimes in developing countries. The central claim is that political and institutional factors have an important, predictable impact on the duration of fixed exchange rate regimes. I use a survival analysis approach to study the countries' probability to exit from an existing pegged exchange rate arrangement.

Most previous studies on exchange rate regime choice have employed binomial or ordered multinomial discrete choice models (see, e.g., Collins 1996, Edwards 1996, Klein and Marion 1997, Rizzo 1998, Poirson 2001, Frieden, Ghezzi and Stein 2001). A major shortcoming of these studies is the assumption that the probability of a regime shift in any year is the same as in any other year. By this, these studies fail to consider the high time-dependence and considerable inertia of exchange rate regimes. For example, it seems not appropriate to assume that the probability that a country abandons an exchange rate peg is the same for a peg that has persisted for one year than for a peg that has been maintained for ten years. Studies of survival analysis account for these time effects and test for duration dependence, i.e. if exchange rate regime duration is a function of time. The strength of this approach lies in the explicit modeling of time-dependence and the inclusion of explanatory variables that change over time. As the choice of an exchange rate regime is not a once-and-for-all decision but is

likely to change over time, it seems particularly useful to think of regime choice in terms of the likelihood of the abandonment of the prevailing exchange rate regime (Masson 2001). Until now, few economists have used time as a variable to explain exchange rate regime duration. Notable exceptions are Masson (2001) as well as Calderón and Schmidt-Hebbel (2003). These studies measure the probability of regime transitions by Markov chains examining transition matrices for different time periods. However, this methodology, though appropriate for their special case of examining regime transitions, fails to take into account time-varying covariates. Blomberg, Frieden, and Stein (2001) use a duration model similar to the approach presented in this paper. These authors find that political factors have a strong impact on the duration of a fixed exchange rate regime. In particular, their analysis suggests that countries with larger manufacturing sectors are less likely to maintain a peg. However, these authors do not take a global view on developing countries as this paper but limit their analysis to Latin American countries. Moreover, the Weibull model that is used in their empirical analysis makes very restrictive assumptions about the duration of exchange rate regime pegs. This paper uses a more flexible, semi-parametric technique invented by Cox (1972).

The remainder of this paper proceeds as follows: Chapter 2 reviews the literature on the political economy of exchange rate regimes in developing countries and derives testable hypotheses. The data, the variables, and the coding of the variables are described in Chapter 3. Chapter 4 introduces the Cox model in the context of exchange rate regime shifts. The empirical section is split into two parts. Chapter 5.1 gives a purely non-parametric analysis, while Chapter 5.2 presents estimation results based on the semi-parametric approach by Cox (1972). Finally, Chapter 6 contains concluding remarks.

2. The Normative and the Positive View on Exchange Rate Regime Choice

The theory of optimal currency areas offers a first important reference point when analyzing the question of whether to have a fixed or a floating exchange rate. In this view, the benefits of an exchange rate peg increase with growing economic integration, since with strong external linkages the elimination of exchange rate volatility leads to a high reduction in transaction costs (McKinnon 1963). The costs of an exchange rate peg are based on the loss of the exchange rate as an adjustment mechanism in case of asymmetric shocks. If the danger of asymmetric shocks is low (Kenen 1969) or if there are alternative adjustment mechanisms, such as a high labor or capital mobility (Mundell 1961), these costs will be low and the economy can relinquish of the exchange rate adjustment mechanism.

Although some econometric work has found empirical regularities (see, e.g., Poirson 2001, Juhn and Mauro 2002), most analysts nowadays consider the OCA theory inadequate for explaining exchange rate regime choice (Krugman 1995). More recent work on exchange rate regime choice has emphasized the gains in anti-inflationary credibility by fixing to a low inflation country. In this view, countries with a low reputation for price stability (e.g., due to poor inflation records) fix their currency to that of a larger trading partner as a commitment to monetary stability.

The most fashionable current view on exchange rate regime choice claims that in a world of increasing financial instability, only "corner solutions", i.e., either hard pegs (dollarization or currency unions) or free floats, are feasible. The deep currency crises in Europe, Latin America and Southeast Asia in the last decade prompted many economists to argue that intermediate solutions, such as crawling pegs or bands, are no longer sustainable (Frankel 1999, Begg et al. 2001). The argument is based on the inherent trade-offs imposed by the unholy trinity. Accordingly, a country cannot fulfill all of its three policy goals monetary policy autonomy, exchange rate stability, and free capital flows. Given the high degree of international financial integration that has resulted from the elimination of capital controls since the early 1980s, basically two options remain for economic policy: the country can either irrevocably fix (and constrain monetary policy) or float (at the possible cost of high exchange rate volatility). If it wants to control both the exchange rate and interest rate, cross-border flows of capital will either render monetary policy ineffective, or result in an abandonment of the exchange rate peg.

However, the bipolar view has been challenged both theoretically and empirically. Theoretically, the framework of the unholy trinity does not imply that complete dominance need to be given to either domestic monetary policy or a fixed exchange rate. Instead, monetary and exchange rate policy can be wisely combined. However, experience shows that it is very difficult to consistency constraint. Moreover, the regimes at the extremes may be subject to pressures from the financial markets. As demonstrated by the collapse of Argentina's currency board at the end of 2001, even a currency board system can fail if the government does not follow a sound fiscal policy and if structural issues are neglected (Setzer 2003). Thus, in the long-term credibility cannot be borrowed by simply adopting a hard peg to a stable currency but must be earned by a sound macroeconomic policy and the building up of effective domestic institutions (Diehl and Schweickert 1997, p. 23). Similarly, free floats can come under attack from financial markets, as happened among others in South Africa (1998 and 2001) or Italy (1995). Further, there has been no solid empirical evidence to support the

view that intermediate regimes would eventually vanish (Masson 2001, Levy Yeyati and Sturzenegger 2001). Only a few countries have moved to irrevocably fixed regimes. These examples include Ecuador, El Salvador and a number of CEECs. Noting that no single regime would be right for all countries and at all times (Frankel 1999), a growing number of observers argues that intermediate regimes remain a viable and attractive option for many countries (see, e.g., Bofinger and Wollmershäuser 2001).

Which of the two alternatives, monetary policy autonomy or stable exchange rates, the government chooses to sacrifice (more) may also depend on political and institutional factors. However, what are the political factors that increase or lower the probability of the "survival" a fixed exchange rate regime? This question is crucial because it helps to understand why countries often deviate in terms of exchange rate policy from recommendation from a purely normative view. The remainder of this chapter identifies five political and institutional factors which are supposed to provide explanatory power with respect to exchange rate regime duration: partisan motives, the timing of elections, the number of veto players, the degree of central bank independence and the type of political system.

Partisan Motives: A first political argument is based on the Partisan theory, initiated by Hibbs (1977). This theory of macroeconomic policy builds on the stylized fact that parties represent different core constituencies. Parties from the ideological right traditionally have strong ties to the business and financial sector. Since these social groups hold more wealth and are more secured from unemployment, right-wing parties attach a high priority to maintain price stability while they are willing to accept a certain level of unemployment. Parties from the ideological left, on the other hand, have closer links to workers and trade unions whose income strongly depends on employment opportunities. Therefore, left wing parties give priority to employment and distributional aspects, thereby accepting a certain degree of inflation. Consequently, they are more inclined to use expansionary macroeconomic policy to manage the domestic economy.

These distributional differences have important implications for the choice of the exchange rate system. The political attractiveness of different exchange rate arrangements varies according to the macroeconomic preferences of a policymaker. Since Left governments are generally more inclined to use expansionary macroeconomic policy to manage the domestic economy, the real exchange rate is likely to increase and the danger of a devaluation grows. As a consequence, left-wing parties will have a lower propensity to fix. By contrast, right-

wing governments, being more concerned about stabilizing the economy and securing the real value of investment and creditor savings, have a greater incentive to maintain a currency peg.

Even if governments initially do not act according to their partisanship, market adjustment to inflationary expectations can create a self-fulfilling prophecy (Alesina 1989). Since a lax economic policy that is incompatible with the proclaimed level of a fixed exchange rate, is more likely to occur under a left- than under a right-wing government, left-wing governments are generally seen as less credible with respect to commitments to avoid inflation. When individuals realize this inconsistency, they will seek to convert large amounts of their holdings in domestic currency into foreign-denominated securities. As a result, the domestic currency experiences downward pressure. In the end, the authorities will no longer be able to sustain the exchange rate peg. By contrast, rightist governments do not have to change their monetary policy to maintain a fixed exchange rate. A promise to secure price stability is more credible and, all things equal, pressure for devaluation is less likely to occur.

Hypothesis 1 summarizes the prediction regarding the impact of partisanship on the duration of currency pegs.

Hypothesis 1: Countries with a left-wing government have a higher probability of exiting from a currency peg than countries with a right-wing government.

Elections: In contrast to the partisan models where cycles are generated by heterogeneous preferences of different parties, political budget cycles in opportunistic models are a consequence of opportunistic incumbents that are driven by the motive to maximize their chances of reelection (Nordhaus 1975). A number of studies have shown that electoral outcomes are strongly influenced by economic conditions (Lewis-Beck and Stegmaier 2000). The probability of reelection is higher when the economy prospers than when economic conditions are bad. Voters are taken to express a general dissatisfaction when the economy is in recession and hold the government responsible. Inasmuch exchange rates influence the economic key indicators price level, employment and real income, the exchange rate regime may be of strategic value for the incumbent to maximize its reelection prospects.

Early opportunistic models were based on adaptive expectation models assuming naïve, myopic voters. Under the assumption of an exploitable Phillips-curve trade off between inflation and unemployment, governments have an incentive to manipulate the economy by an expansive monetary policy immediately prior the election. As nominal wages are rigid, the inflationary effects of this policy lead to lower real labor costs, increasing labor demand and higher output and create by this the appearance of a strong economy. Voters are expected to

reward this policy by reelecting the incumbent government not realizing that this policy drives the economy into a recession once the election is over and the price level responds to the increase in the money supply.

While this pattern would expect governments to choose a flexible exchange rate in the run up to elections in order to fully exploit the Phillips-curve trade off (see, e.g. Gärtner and Ursprung 1989, Bernhard and Leblang 1999), other authors argue that the exchange rate regime itself can be a source of strength. A modified version of this cycle for an open economy is presented by Schamis and Way (2001). They model the situation of a developing country with a long inflationary history. Basically, the government faces two alternatives to combat inflation - exchange rate based stabilization and money based stabilization. Both anti-inflationary tools differ in terms of the timing of the recessionary effects. Schamis and Way (2001) show that in countries with high inflation persistence the adoption of a fixed exchange rate is particularly attractive in the run up to elections. As the implementation of a new exchange rate stabilization program is usually accompanied by a short-run consumption boom and falling inflation, a government maximizes its reelection prospects by fixing the exchange rate. By contrast, the restrictive short-run effects of money based stabilization programs with low growth and higher unemployment are prohibitive for governments asking for voters' support. This is true even though after the election the remaining inflation differential in exchange rate based stabilization programs usually leads to a real appreciation with severe negative consequences for output and employment.[2] However, as pre-election economic policy has a short-time horizon, the government is willing to accept the higher long-term risk of exchange rate based stabilization programs as long as these effects occur after the polling day. Thus, the different time paths generated by money based and exchange rate based stabilization programs cause the incumbent to prefer exchange rate based stabilization in the run up to election.

More recent work has shown that electoral cycles do not have to be based on naïve, backward-looking voters: even with fully rational, forward-looking voters, similar cycles can arise due to informational asymmetries about the incumbent's competence to run the government. In these models electoral cycles occur as a result of a signaling game between the government and voters. Stein und Streb (1998) develop a model where a devaluation has (through its effect on the nominal interest rate) the same effects as an inflation tax. The authors follow the approach by Rogoff and Sibert (1988) and Rogoff (1990), assuming that governments differ with respect to their competency. Competency equals here the

[2] Calvo and Végh (1999, p. 17) call this the "recession-now-versus-recession-later-hypothesis".

incumbent's ability to provide a constant amount of public goods at low taxes. Under the assumption of incomplete information, an opportunistic government has an incentive to implement an exchange rate based stabilization program in the year preceding an election to signal high competence to the voter. The resulting lower inflation expectation and the temporary consumption boom increase the prospects for reelection. After the election, the probability of the abondonment of the stabilization program is high as the political costs of a devaluation decrease.

One might also suggest that politicians have an incentive to engineer pre-election booms by devaluing. Expressed in a textbook fashion, an undervalued exchange rate leads to increased international competitiveness, improves the current account, and fosters economic growth. As the inflationary effects emerge only with a slight lag, the negative consequences of this policy in terms of lower real income and/or higher prices would only be realized after the polling day and the incumbent could increase its probability of reelection. While this might be a realistic scenario for industrial countries, devaluation cannot be expected to improve the competitiveness of most developing countries. This is due to several reasons: A first reason relates to the usually higher openness of these countries. When imports make up a large share of the domestic consumption basket, the pass-through from exchange rate swings to inflation is much higher (Calvo and Reinhart 2000, p. 18).

Secondly, incumbent governments with a low monetary credibility will try to avoid a devaluation before the election. Frieden, Ghezzi and Stein (2001, 52) argue that the decision to abandon a fixed exchange rate regime and devalue is often interpreted in a way that other complementary parts of the stabilization program (such as a sound fiscal policy) will not be maintained either. As a consequence, risk premia and public debt increase. Thus, in developing countries, the argument by Cooper (1971) that devaluations impose high political costs on the government, should outweigh any gains from devaluing. Most developing countries will therefore delay devaluation and the abandonment of an exchange rate peg until after the election. Empirical evidence supports this view. Frieden, Ghezzi and Stein (2001, 51) analyze the pattern of the exchange rate around 242 elections in Latin American countries and find strong support for the hypothesis that devaluations are more likely after the election than before. The pattern is especially strong if elections led to a change in government, a behavior which Edwards (1996) characterized as "Devalue immediately and blame it on your predecessor". Additionally, further empirical support with respect to opportunistic cycles is provided by a number of recent case studies (Aboal and Calvo 1999, Assael and Larrain 1994, Bonomo and Terra 1999.

This leads to Hypothesis 2:

Hypothesis 2: Pre-election (post-election) years are more (less) likely to see a change from floating to fixing than from fixing to floating.

Central Bank Independence: Exchange rate policy may also differ among countries because their policymaking is governed by different institutions. The degree of central bank independence is a case in point. A lot has been written explaining why politicians willingly relinquish a sizeable part of their power and delegate policy tasks to an independent agency. Most of them see the inflation bias time inconsistency problem as the rationale for delegation (see, e.g., Drazen 2000, Rogoff 1985). This problem, originally formulated by Kydland and Prescott (1977) and later applied to monetary policy by Barro and Gordon (1983), exists because *ex post* politicians have a strong incentive to deviate from a pre-announced monetary policy and surprise the voters with inefficiently high inflation. Such a policy generates higher growth and employment, and thereby improves the incumbent's reelection prospects. Rational forward-looking agents, however, will anticipate the loose monetary policy and adjust their inflation expectations. The result of this behavior is higher inflation but no higher growth.

Granting independence to central banks or pegging the exchange rate to a low-inflation country provides a solution to this dilemma. Both forms of monetary commitment ensure a predictable and stable monetary policy that keeps inflation down and signals to economic agents that monetary policy will be insulated from short-term electoral manipulation (see Rogoff (1985) for central banks and Giavazzi and Pagano (1988) for exchange rate pegs). In the case of independent central banks, monetary policy is delegated to a conservative central banker that has a longer time-horizon and is more inflation-averse than the government, in the case of pegged regimes, monetary policy is pursued by a foreign central bank with a high reputation of price stability. The implication is that independent central banks could be considered as an substitute for a fixed regime to provide credibility. If the elimination of the inflation bias is already achieved by an independent central bank, there is no need for countries with independent central banks to give up exchange rate flexibility and to fix. Thus, one would suggest that countries with independent central banks have a lower propensity to peg than their more dependent counterparts (Broz 2000, Bernhard, Broz and Clark 2002, Simmons 1994).

A competing line of argument holds that central bank independence and fixing should go hand in hand. Bernhard, Broz, and Clark (2002) demonstrate that exchange rate pegs and central bank independence are not perfect substitutes. A currency peg has the advantage of

simplicity. Exchange rates are watched closely by the markets and make fixed regimes a highly visible and transparent way to demonstrate the governments' commitment to price stability. The abandonment of a peg therefore bears considerable political costs. On the other hand, violation of central bank independence cannot be easily observed. Deviations of *de facto* independence from *de jure* independence will hardly be realized by economic agents.[3] Particularly for developing countries where central banks often have a poor record in economic management, a currency peg might therefore provide a better solution to the credibility problem than the rather opaque commitment to purely separate monetary policy from the political system by granting independence to the central bank. However, the fact that the numerous financial crises in the 1990s were all characterized by collapsing pegged regimes shows that fixing provides inappropriate insurance against currency risk. Furthermore, there is some evidence that though pegged regimes have led to lower inflation, this has come at the cost of lower growth (Ghosh, Gulde and Wolf 2002). By contrast, central bank independence is not correlated with lower growth rates (Alesina and Summers 1993). Broz, Bernhard and Clark (2002) report a second point against a substitutive relationship between central bank independence and pegged regimes. In this view, the country's readiness to adopt fixed regimes and to implement an independent central bank is both driven by domestic institutions and the country's disposition towards price stability. For instance, Hayo (2003) shows that the creation of an independent central bank is more likely in countries with strong anti-inflationary social interests. Similarly, Freytag (2002) argues that the institutional setting (including the degree of economic freedom) determines the policymakers' incentives to pursue an overexpansionary monetary policy to meet other objectives than price stability. Thus, one could expect countries that are more attached to price stability and that have a strong inflation aversion to make their central bank independent *and* to peg the exchange rate.

Given these contradicting lines of argument, it is not surprising that empirical findings could not detect a clear relationship between central bank independence and fixed regimes. Bernhard, Broz and Clark (2002) show that in reality, all combinations of monetary regimes have existed for long periods and for a large number of countries in their sample of 76 countries. Empirical research has only found some regional features: Frieden, Ghezzi and Stein (2001) found that in Latin American countries more independent central banks are correlated with floating, though the coefficient is not significant.

[3] Though many central banks now issue more information regarding their tasks, objectives and decisions than a decade ago.

To sum up, out of the political-economic literature on monetary policy emerge competing propositions about how central bank independence should affect exchange rate regime choice. It is therefore difficult to find a straightforward hypothesis with respect to the combination of both forms of monetary commitment.

Hypothesis 3: The impact of central bank independence on exchange rate regime duration is inconclusive.

The number of veto players: A related case in point is the impact of the number of veto players on the exchange rate regime decision. Veto players refer to the number of institutional or partisan actors whose agreement is necessary for a change of policy (Tsebelis, 1995, p. 88). Keefer and Stavasage (2002) argue that the credibility of an independent central bank increases with the number of veto players in government. The reason is that a high number of veto players make it more difficult for the government to renege on the delegation of monetary policy. On the other hand, if the number of veto players is low, it is less costly for politicians to revoke the policy commitment. In such a context, the time-inconsistency problem of monetary policy is not solved since the benefits for political actors to deviating from the policy ones announced might be higher than the costs associated with the revocation of the commitment.

The question is whether these considerations can also be applied to the exchange rate regime choice: Does the underlying veto structure influence the sustainability of a fixed exchange rate regime? A possible explanation parallels the idea with respect to central bank independence: A system of checks and balances should make it more difficult to override the commitment of exchange rate stability. However, Keefer and Stasavage (2002) assume that multiple veto players do not enhance the credibility of fixed regimes. Given that a high-inflation country usually pegs to a low-inflation country, their first argument is that inflation outcome under a pegged regime is lower than the preferred inflation outcome for even the most inflation-averse domestic policy-maker. Therefore, there would always be an incentive to renege on the commitment unconditional on the number of veto players. More important, however, these authors argue that decisions about exchange rate policy are typically made by the executive branch and are therefore not subject to (legislative) veto power.

Asadurian and Clark (2003) extend the argument by Keefer and Stavasage (2002) and identify an indirect link between the number of veto players and the sustainability of fixed regimes. Under the assumption that independent central banks and pegged regimes are substitutes, Asadurian and Clark (2003) argue that as central banks are only credible when there are

multiple veto players, the inflation-fighting effect of pegs should increase when the number of veto players is low. With respect to the exchange rate regime choice, the authors conclude that as the gains from pegging are particularly high in the absence of veto players, the propensity of pegging should increase with a lower number of veto players.

The importance of the institutional framework is also emphasized by Bernhard and Leblang (1999). According to these authors, the need for the incumbent to control monetary policy is particularly pronounced in political systems that create high incentives for opportunistic policy. More precisely, a) in majoritarian systems where small swings in the votes can have a large effect on the distribution of legislative seats and b) in systems where opposition parties have only weak influence, governments are more likely to keep control of monetary policy and opt to float. In these systems, stakes in the election are high and the use to manipulate monetary policy for electoral purpose is of special relevance. By contrast, proportional representation and systems where the opposition is not completely kept away from power, create less incentive for floating.

Note that the latter results contradict the findings of Asadurian and Clark (2003). For illustration, take the example of a political system with "majoritarian-low opposition influence". As this system can be thought of as a system with a low number of veto players, Asadurian and Clark (2003) predict for this state a higher propensity to peg, Bernhard and Leblang (1999), on the contrary, expect this country to float. In the same way, an institutional framework with proportional representation and a high influence of the opposition equals a situation with many veto players. While Bernhard and Leblang (1999) predict in such a context fixing, Asadurian and Clark (2003) see this country to float.

Most empirical findings[4] and recent research are more in line with the results of Asadurian and Clark (2003). With respect to the results by Bernhard and Leblang (1999), Clark (2002) claims that while it is true that pegging the exchange rate reduces the scope of autonomous monetary policy, policymakers get fiscal policy as a countermove to engineer a pre-election boom. Consequently, the incentive for countries with a low number of veto player to float is lower than expected by Bernhard and Leblang (1999).

A last line of work is based on the finding of game theorists that cooperation becomes more difficult as the number of parties involved in the game increases. Eichengreen and Leblang (2003) apply the argument by Roubini and Sachs (1989) that unstable governing coalitions lead to higher budget deficits to exchange rate regime choice. The authors argue that

[4] Frieden, Ghezzi, and Stein (2001), e.g., find that strong governments tend to fix.

incumbents in political systems with a high number of parties in the coalition (i.e. many veto players), are more suited to target special constituencies and, thus, have a higher reliance on the inflation tax. The implication is that more fragmented party systems are expected to be unable to implement the necessary macroeconomic policy adjustments consistent with the maintenance of a currency peg and will therefore choose to float.

Given these considerations, the expectation with respect to the impact of veto players on the exchange rate regime can be summarized as follows:

Hypothesis 4: All else equal, countries with more veto players have a higher probability of floating and therefore a higher probability of exiting from a currency peg.

Political regime type: The attractiveness of pegging may also depend on the political regime type. Theoretic reasoning by Broz (2000) and Bernhard and Leblang (1999) suggests that autocratic countries should rely more heavily on pegged regimes than democratic ones. For both studies the point of departure is that countries are interested in a stable economic development, regardless of the political regime type. Even if the political system is non-democratic, the view of the citizens still matters. The public sets at least informal limits on what governments can do. Thus, even authoritarian regimes crave consent and are interested in low economic volatility. However, the misuse of state power creates problems in terms of credibility. Moreover, political decision-making in autocracies is generally less transparent than in democracies. Goodell (1985) argues that autocratic regimes generate unpredictable economic conditions, because there is no check on the autocracy's ability to change the "rules of the game" at any time. With regard to monetary policy, autocracies will therefore find it particularly difficult to convince economic actors that its monetary authorities will *ex post* not deviate from the announced policy and generate higher than expected inflation. In such a context, central bank independence is a too opaque commitment to solve the time-inconsistency problem. Instead, in countries where popular participation and institutions are weak, a stronger commitment technology that better ties the hands of policymakers is needed. Thus, an external constraint in form of a fixed exchange rate is a superior commitment mechanism than an independent central bank. By contrast, political decision-making in democracies has a higher transparency. The system of checks and balances in the structure of the government promotes accountability. Thus, transparency on the part of the government makes even an opaque commitment such as central bank independence credible and effectively solves the time-inconsistency problem. Manipulation of the commitment will be

detected and punished by media and political opposition. Consequently, democratic societies have a lower need to fix the exchange rate.

Broz (2000) put forward an additional argument why autocratic countries might be more likely to peg their currency than democratic societies. He suggests that pegged regimes should be more sustainable in more authoritarian regimes. The reason is that fixing the exchange rate requires a bundle of complementary reinforcing strategies such as financial stability, developed banking system or responsible wage-setting policy. Since authoritarian political regimes give the incumbent autonomy from distributional pressure, they increase the government's ability to impose the short-term costs associated with these necessary policy changes. On the other side, democracies are vulnerable to pressure from interest groups and find it difficult to impose unpopular measures.

The above-mentioned theoretical propositions have found empirical confirmation. Broz (2000) finds that central bank independence improves inflation performance only in countries with high levels of political system transparency. By contrast, an exchange rate peg as a more transparent commitment mechanism constrains inflation even in the absence of democratic institutions. Accordingly, Frieden, Ghezzi, and Stein (2001) find that in Latin America dictatorship seems to increase the likelihood of adopting a fixed regime.

Thus, the findings about the political regime type and the exchange rate regime can be summarized in the following hypothesis:

Hypothesis 5: The more autocratic a government, the more likely it is to adopt and to maintain exchange rate pegs.

All these hypotheses will guide the empirical investigation in Chapter 5. First, however, let us look at the variables and the coding of our dataset.

3. The Dataset

In order to test empirically for the conjectured impact of economic and political factors on exchange rate regime duration, I employ a sample of 49 developing countries.[5] The main criteria for choosing the countries were that sufficient data for the exchange rate regime classification and a number of covariates could be found. Country characteristics are coded annually beginning in 1974 and ending in 2000. The data are organized in country-years; so

[5] The countries are: Algeria, Argentina, Belarus, Bolivia, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Cote d` Ivoire, Croatia, Cyprus, Czech Republic, Dominican Republic, Ecuador, El Salvador, Estonia, Guatemala, Guyana, Haiti, Honduras, Jamaica, Latvia, Lebanon, Lithuania, Malaysia, Mexico, Moldova, Morocco, Nicaragua, Nigeria, Panama, Paraguay, Peru, Philippines, Poland, Rep. of Korea, Romania, Russia, South Africa, Slovakia, Slovenia, Sta. Lucia, Suriname, Thailand, Turkey, Ukraine, Uruguay, and Venezuela.

that each observation represents the value of the variables in one year in one of the 49 countries under consideration.

The main focus of the analysis is on the variable "DURATION" as it characterizes the "life" of a fixed exchange rate regime (in years). An exchange rate regime transition is defined simply as a move down or up in the exchange rate classification. A first challenge in this context is to classify exchange rate regimes. Traditionally, most studies (see, e.g., Collins 1996 or Edwards 1996) have relied on the IMF classification published every year in the IMF Annual Report on Exchange Rate Arrangement and Exchange Rate Restrictions (AREAER).

The IMF classification is "de iure", i.e. it basically builds on official statements of the monetary authorities in the member states. Though this classification provides long and comprehensive time series, a major drawback of the IMF evaluation is that the stated commitments of the authorities do not always correspond to actual behavior. Particularly in developing countries, observed exchange rate data do validate the announced regime. Countries that claim they float often do not, there seems to be "fear of floating" (Calvo and Reinhart 2000). As a consequence, even countries are classified as floaters where the monetary authorities have frequently and extensively intervened on the foreign exchange market. Recent research into exchange rate regimes therefore moves beyond pure "de iure" classifications. The new measure by Levy Yeyati and Sturzenegger (LYS thereafter) (2001), e.g., avoids the shortcomings of the formally declared IMF classification providing a "de facto" classification for the period 1974-2000. LYS (2001) explicitly look at the *actual* behavior of exchange rates and completely ignore the official classification. The authors use three variables representing the observed behavior of exchange rates: the monthly percentage change in the nominal exchange rate, the standard deviation of monthly percentage changes in the exchange rate, and the volatility of reserves. Although the classification by LYS (2001) has also been subject to considerable criticism,[6] the following empirical part relies on their three-way classification (fixed, intermediate, and floating) since the interest is on the *actual* policies of the countries under consideration. Flexible regimes are both managed floats and free floats, those coded as "intermediate" are basically crawling pegs or bands, while fixed exchange rate regimes are defined as pegged to a particular currency or basket.

[6] The most important shortcoming is that data about foreign reserves are difficult to interpret. A higher amount of foreign reserves, e.g., does not necessarily be caused by foreign intervention but can also be due to a simple revaluation of the reserves in the course of exchange rate movements. Furthermore, it is difficult to differentiate changes in the nominal exchange rate due to intervention from changes due to asymmetric shocks.

The theoretical considerations in Chapter 2 have identified various potential political and institutional determinants of the choice of exchange rate regimes. The following paragraphs describe the coding of the political and institutional variables.

The solution to the data problem with respect to the ideological position of a government is to use information from the Database of Political Institutions (DPI), a project conducted by the World Bank (Beck et al. 2001). The advantage of these data is that they provide a consistent measure of whether the executive is dominated by a party from the Right (RIGHT), the Center (CENTER) or the Left (LEFT).

Measuring central bank independence is not as straightforward. In principle, indices of central bank independence can be classified into two groups depending on whether their focus on actual or formal dependence. Given the large discrepancy between the (often relatively high) legal independence of central banks in developing countries and their actual independence, it seems more reasonable to use an indicator that serves as a proxy for actual independence (Cukierman 1992). The most common index here is the turnover rate of central bank presidents, a continuous variable that ranges from zero to one. The basic idea behind this ratio is that, at least over some threshold, a higher turnover ratio indicates a higher influence of the executive branch on monetary policy (Eijfinger and de Haan 1996, Sierman 1998, p. 77). In developing countries a new political leadership is often followed by a replacement of the central bank governor. A limitation of this type of measure, however, is that it treats *every* change of the central bank governor as an indication of political dependence, without inquiring the reasons for the replacement. However, this study uses the turnover ratio as today's most widely used index for research on central bank independence in developing countries.[7] Data for the turnover of central bank presidents are collected from De Haan and Kooi (1998), the IMF International Financial Statistics and national central banks. The number of central bank governor shifts is then divided by the number of years under consideration. The ratio is summarized in the variable CBI.

The variable for the number of veto players, VETO, is based on data from the World bank DPI. In any given year, this variable records the number of veto players in a polity. The variable takes a value of one if there is multi-party system and the largest party received less than 75 percent of the votes. The value of VETO is then incremented depending on the competitiveness of the election, the influence of the opposition, the number and composition of chambers in the legislature (in presidential systems), the parties in the government coalition

[7] For industrial countries, most scholars use the Cukierman-index (see Cukierman 1992) or variations of it (Grilli, Masciandaro and Tabellini 1991).

(in parliamentary systems) and the number of parties in the government coalition that have a position on economic issues closer to the largest opposition party than to the party of the executive.[8] A higher value of VETO therefore reflects a higher number of veto players. The variable is logged to take into account that an additional veto player has a lower impact at higher levels.

As argued by Frieden, Ghezzi and Stein (2001, p. 55), the timing of shifts in exchange rate policy may also depend on the electoral calendar. In order to test whether the period surrounding the election increases or decreases regime duration; a dummy variable, ELECT; is introduced and coded one for years in which an election takes place and zero otherwise. As the incentive for the monetary authorities to manipulate the exchange rate system might differ depending on the political system, in countries with presidential systems only presidential elections are considered, while for countries with parliamentarian systems only parliamentarian elections are coded.

The summary measure to proxy for a country's political regime type, DEMOCRACY, is a country-year's "political score" from the Polity IV dataset (Marshall and Jaggers 2003). These scores are used extensively in international relations and comparative politics. The aggregated score is computed as the difference of two sub-indices, ''Democracy'' and ''Autocracy''. Both sub-indices range between zero and ten.

Political and institutional factors alone cannot account for changes in exchange rate policy. I therefore include a number of economic variables in order to control for conditions that might lead governments to change policy regardless of political and institutional factors. Excluding these variables may lead to bias and violate the assumption of the empirical model. The aim of the following paragraphs is to explain the coding of the relevant economic variables. Data for these variables are from the International Financial Statistics (IFS), the World Development Indicators (WDI 2003), Marshall and Jaggers (2003) and the International Monetary Fund's AREAER.

Pegging the exchange rate requires prudent macroeconomic policy. Quite obviously, overexpansionary monetary policy will lead to a real overvaluation that makes a currency peg unsustainable. Similarly, a country which relies on the inflation tax and sales government bonds to the central bank will not be able to keep its exchange rate fixed for long. Many developing countries that have used the exchange rate as nominal anchor initially experienced a sharp decline in inflation. However, in later periods the country's willingness to pursue

[8] A detailed definition of VETO can be found in Beck et al. (2001).

appropriate macroeconomic policy often declined (Diehl and Schweickert 1997). The deterioration in policy discipline was accompanied by higher inflation rates. The implication for the duration of a fixed exchange rate regime is that macroeconomic policy that keeps inflation running at high rates clearly increases the probability of the abandonment of a currency peg. It is therefore expected that high inflation reduces the sustainability of pegged regimes. By contrast, low inflation-countries are better able to maintain a fixed exchange rate regime. In the empirical section, the logarithm of inflation is used, as effects are not expected to be linear. Additionally, the variable INFLATION is lagged one period to avoid reverse causality problems.

It is a well-established proposition that a country's ability to cope with external shock variability is an important factor with respect to the exchange rate regime decision. Theory predicts that countries with flexible exchange rate regimes are better able to cope with terms of trade volatility than countries with fixed regimes. In a country with a flexible exchange rate, the negative effects of large and frequent sudden shifts in the demand for the country's exports will be offset by movements in the exchange rate, eliminating much of the impact on economic activity. This possibility is ruled out for a country under a fixed exchange rate regime. Countries with a pegged regime will therefore experience a higher output response for a given terms of trade shock. An extensive empirical research has confirmed this view (see, e.g., Broda and Tilli 2003). Edwards and Levy Yeyati (2003) use a sample of annual observations for 183 countries over the 1974-2000 period and find that under flexible exchange rates the effects of terms of trade shocks on growth are approximately one half that under pegged regimes.

To measure the extent of external shock variability, SDEXPORTS measures the logarithm of the standard deviation of the real export growth. It is expected that SDEXPORTS is positively related to a higher propensity to float.

Turning to trade openness, countries with a high degree of economic integration are generally considered more likely to fix their exchange rate since large and unpredictable changes in the nominal exchange rate might hamper international trade (McKinnon 1963). Moreover, in open economies exchange rate fluctuations strongly affect the inflation rate, as changes in the exchange rate are passed-through to prices. Exposure to international trade is proxied in the standard manner as exports plus imports as a proportion of gross domestic product. Again, this variable (OPEN) is lagged one period.

Following the insight of the Mundell-Fleming macroeconomic model that with restricted capital flows countries can, at least theoretically, maintain both exchange rate stability and monetary autonomy, it is expected that decisions about capital controls and exchange rate policy are related. Even more important in our context is the recognition that capital controls should enhance the sustainability of a fixed exchange rate regime, since it is less likely that a lax fiscal policy or an expansive monetary policy which are both incompatible with the proclaimed level of a fixed rate trigger capital outflows, forcing the monetary authorities' to give up its defense of the original parity (Edwards 1996, Berger, Sturm and de Haan 2000).

A common problem with respect to capital controls and the exchange rate regime decision is the issue of causality. Do countries with capital controls are better able to maintain a pegged exchange rate regime? Or is it merely that pegging the exchange rate increases the likelihood of imposing capital restrictions? Causality might run both ways and Eichengreen (2001) argues that the question of causality is still unresolved, since existing studies cannot decisively separate out cause and effect. Again, there is a wide range of possible codings for this variable, ranging from indirect measures such as calculating the differences across states in the rate of return to capital to Kraay's (1998) and Swank's (1998) indicators which use actual capital inflows and outflows as a percentage of gross domestic product as a measure of the freedom of capital movements. More direct measures are usually based on raw data provided by the International Monetary Fund's AREAER. Until 1996, the IMF compiled four simple dummy variables to indicate whether a country imposed capital controls or not: The most relevant capital control indicators are CAPOP2 and CAPOP3. They indicate restrictions on current account and capital account transactions, respectively. Additionally, CAPOP1 is an indicator variable for the existence of multiple exchange rates, CAPOP4 is a variable indicating the surrender of export proceeds. Since the last two variables are often used to avoid invading restriction on the capital account, the IMF classification therefore contains (limited) information on the intensity of controls. The information in the variables CAPOP1 to CAPOP4 is summarized in a variable CAPOP which takes values from 1 to 4. In order to address the issue of reverse causality, the variable is lagged one period.

From 1997 on and in order to provide a more sophisticated measure for capital controls, the IMF identifies ten categories of capital transactions that may be subject to controls.[9] Unfortunately, the two classifications cannot be easily merged. Following Glick and

[9] The ten categories are: (1) capital market securities, (2) money market instruments, (3) collective investment securities, (4) derivatives and other investments, (5) commercial credits, (6) financial credits, (7) guarantees, sureties, and financial backup facilities, (8) direct investment, (9) liquidation of direct investments, and (10) real estate transactions.

Hutchinson (2000) I define the capital account to be restricted for the 1974-2000 period if controls were in place in 5 or more of the AREAER sub-categories of capital account restrictions and financial credit was one of the categories restricted.[10]

The early work on currency crises, initiated by Krugman (1979), argued that the sustainability of pegged regimes decreases if a) the stock of foreign reserves run low or if b) the money supply grows in a way which is incompatible with the proclaimed level of the fixed exchange rate. Individuals realize this inconsistency and seek to convert large amounts of their holdings in domestic currency into foreign-denominated securities. As a result, the domestic currency experiences downward pressure. In order to defense its exchange rate commitment, the central bank is then forced to purchase the excessive supply of domestic currency on international financial markets, thereby reducing its foreign exchange reserves. Finally, if the central bank's foreign reserves run low, the monetary authorities' are forced to give up its defense of the original parity. A lower ratio of reserves should therefore lead to a lower sustainability of pegged regimes. To assess this mechanism, a variable RESERVES, is constructed which measures the ratio of reserves over money supply (M2). Since this effect is not expected to be linear, an additional dummy variable RESLOW is used with a value of one if the reserve ratio falls under a critical threshold and zero otherwise. Both variables are lagged one period.

All in all, I therefore have a total of 17 explicative variables although many of these data are pure dummy variables. The full statistical model is detailed in Chapter 4.

4. Modelling Exchange Rate Regime Duration

As briefly discussed in the introduction, the statistical analysis relies on survival analysis. The nature of survival analysis is to measure the time to the occurrence of an event, which is referred to as "failure" or "exit". Modeling the duration between transitions to different states has been a common objective in many different areas of applied sciences such as medical sciences or engineering. Within economics, the techniques of survival- or event-history analysis have been mainly used on empirical studies of labor markets. For example, survival analysis is a common tool to analyze the duration between spells of employment or the time until an unemployed person gets a job.

The flexibility of the survival analysis approach has two main advantages for our analysis: First, it can be used to analyze the influence of various covariates on the duration of exchange rate regimes while taking into account previous period's regime. Second, it allows us to test

[10] In merging the old and the new capital control restriction data, data discrepancies emerged in a small number of cases. The discrepancies were reconciled by giving the new classification priority.

the underlying hazard of an exchange rate regime shift. There are good reasons to believe that time plays an important role in the persistence of exchange rate regimes. For example, one might hypothesize that short time after introducing a new regime the conditional probability of exit is high. However, over time, the likelihood of leaving the regime (*exit* in the survival jargon) could decrease.

Before looking at these two points more deeply, the aim of the following section is to illustrate the general methodology of the concepts which have been developed to analyze duration. In principle, four functions can be used to characterize the distribution of the survival time: the cumulative failure distribution function, the density function, the survivor function and the hazard function.

The cumulative failure distribution is characterized by

$$F(t) = \Pr(T < t)\,, \tag{1}$$

where T is a continuous random variable which takes values t that measure the time spent in a particular state. The corresponding density function *f(t)* can be obtained by differentiating the failure distribution and describes the likelihood that an event takes place exactly at time t. Complement of the cumulative distribution function, the survivor function is defined as the probability that the event of interest has not occurred by duration t, i.e. the random variable T exceeds the specified time t.

$$S(t) = 1 - F(t) = \Pr(T > t). \tag{2}$$

S(t) is a non-increasing function with a value one at the time origin and a value zero as t goes to infinity. The relationship between the failure (or exit) rate and the time already spent in that state is determined by the hazard function. The hazard function emphasizes the conditional probability: It describes the probability of a spell ending at some time point, given that the spell has lasted to that time point.[11] It is defined as

$$\lambda(t) = \Pr(T = t \mid T > t) = f(X, \beta), \tag{3}$$

a function of a set of covariates X and a coefficient vector β. The covariates are expected to influence the hazard of events.

[11] For example, it expresses the probability of an exchange rate regime to change within the next year given that it has existed for five years. By contrast, specifications in terms of a probability distribution emphasize unconditional probabilities (e.g., the probability of an exchange rate regime to persist exactly 6 years).

After some simple transformations, $\lambda(t)$ (also known as the instantaneous rate of failure) can be expressed as the ratio of the duration density to the complement of the survivor function at time t:

$$\lambda(t) = f(t) / S(t) . \tag{4}$$

Note that the hazard rate varies depending on the potential pattern of duration dependence. As time flows, the hazard rate can increase (positive duration dependence), decrease (negative duration dependence), remain constant or take on non-monotonic shapes. Possible values for the hazard function range from zero (if the risk of failure is zero) to infinity (if failure is certain at that instant).

In principle, there are three approaches to fitting survival models: Parametric, semi-parametric, non-parametric. The three strategies differ in the form of the survivor function and in the way the survival rate is affected by covariates.

The characteristic feature of the non-parametric approach is that no assumptions about the course of the hazard rate are made. The most common non-parametric approach is the Kaplan and Meier (1958) estimate of the survivor function. This estimator employs conditional probabilities and can graphically be illustrated by a step function that steps down at each time interval. The estimator at any point in time is obtained by multiplying out the survival probabilities across the time interval (Kalbfleisch and Prentice 1980, p. 15):

$$\hat{S}(t) = \prod_{j|t_j<t} \left(\frac{n_j - d_j}{n_j} \right), \tag{5}$$

where t_j is the survival time, n_j is the number of countries "at risk" of failing at t_j and d_j is the number of regime shifts at t_j. Each conditional probability estimator is obtained from the observed number at risk and the observed number of exits and is equal to "*n-d/n*". The Kaplan-Meier estimator is robust to censoring and uses information from both censored and uncensored observations.

In contrast to non-parametric estimates, parametric approaches require a very detailed idea about the course of the hazard rate. Since I cannot be totally sure about the correct specification of the parametric model and since wrong specification may lead to important bias in the sample, I detect with the possibility to include parametric regression in the analysis. Semi-parametric approaches have much weaker assumption and are therefore widely used in political sciences. The characteristic feature of these models is that the baseline hazard $\lambda_0(t)$ is left completely unspecified. The hazards are made dependent on a vector of

explanatory variables x with coefficients β which are to be estimated and λ_0. The setting is then as follows:

(6) $$\lambda(t, x, \beta, \lambda_0) = \phi(x, \beta)\lambda_0(t),$$

where φ is a positive function of x and β and $\lambda_0(t)$ is the baseline hazard which characterizes how the hazard function changes as a function of time. As can be seen, the baseline hazard depends on t but not on x. That means that it captures individual heterogeneity that is not explained by the covariates. In other words, the baseline hazard can be interpreted as the probability of an exchange rate regime to change conditional on all the covariates of 0. The most common used semi-parametric procedure has been developed by Cox (1972). He proposed to specify the hazard function in the following way:

(7) $$\lambda(t, x, \beta, \lambda_0) = \exp(x'\beta)\lambda_0(t).$$

The advantage of this specification is that nonnegativity of φ does not impose restrictions on β.[12] Furthermore, the proportional hazard assumption is useful because the unspecified baseline hazard drops out of the partial likelihood. Thus the partial likelihood can be maximized using standard methods (Kalbfleisch, Prentice 1980, p. 71).

The resulting likelihood function is then

(8) $$L(\beta) = \prod_{i=1}^{n} \frac{\lambda_i(t, x, \beta, \lambda_0)}{\sum_{j>i} \lambda_j(t, x, \beta, \lambda_0)}$$

under the specification for the hazard rate derived from equation (6), this converts to:

(9) $$\frac{\lambda(t_1, x_1, \beta)}{\sum_{i>1}^{n} \lambda(t_1, x_i, \beta)} = \frac{\varphi(x_1\beta)}{\sum_{i>1}^{n} \varphi(x_1\beta)}.$$

The likelihood function now depends only on the unknown coefficient vector β. The functional form of the hazard rate does not need to be specified. The Cox log likelihood function is then as follows:

(10) $$L(\beta) = \sum_{i=1}^{n} \left\{ \ln \phi(x_i, \beta) - \ln \left[\sum_{j>i}^{n} \phi(x_j, \beta) \right] \right\}$$

where $\phi(x_i, \beta) = \exp(x', \beta)$.

[12] φ must take on non-negative values as there is no negative risk of failure.

Translating the more general situation into the language of our survival framework, the regime persistence, i.e., the time from the beginning of a pegged exchange rate regime until its abandonment is interpreted as the survival time for this regime. Consequently, the phenomenon that an exchange rate peg is abandoned is an event in our model.

Essentially, the methods of survival analysis address the same questions as many other procedures; however, all methods in survival analysis are able to handle the problems of multiple events and censoring. Both problems are distinguishing features of duration data and cannot be easily handled in other empirical models (Kiefer 1988). The problem of multiple events arises because most countries change their exchange rate regime more than once during the survey period. In these cases, a country should not leave the sample, but re-enter with its new regime. Thus each country can experience multiple regime shifts. To estimate the model with multiple failures, it is assumed that, once a regime shift occurs, the hazard function restarted since last failure.

The problem of censoring is due to the possibility that some regimes may not be observed for the full time to failure. For example, right-censoring refers to the fact that the sample ends in 2000 and bias may be introduced because an exit from a currency peg on January 1st 2001 is not taken into account at all in the regression even if the instability that led to it was presumably present in the time frame under study. Similarly, data is left-censored when we do not know the beginning of a specific regime. For example, since our sample starts in 1974, we know that certain regimes started not later than in 1974 but do not know the exact date. A third form of censoring, random censoring, is also relevant to our study. Random censoring is due to the fact that not all countries in the sample are under observation for the whole time. For example, given the poor data quality before 1990, most transition economies were not included in the dataset before 1990. Other countries (e.g. the Baltic states) simply did not exist for the whole sample period. Thus, observation ends at the same time for all countries but begins at different times. In the standard OLS model, for example, one cannot distinguish the Latin American countries that were at risk for the whole period from the transition economies that were only under observation for the 1990s and could not have had exits of a currency peg for the whole survey period. One of the advantages of the survival analysis is that the maximum likelihood framework easily handles the problem of censoring. One can calculate the likelihood of observing a duration, as long as (or longer) than the censored duration, and enters that probability in the likelihood function (Kalbfleisch and Prentice 1980, 39).

5. Estimation Results

5.1 Results for the Kaplan-Meier estimate

This chapter starts with a non-parametric analysis of the 49 countries in the dataset. Estimation results for the Cox model are given in the second part of this chapter.

Figure 1 plots the proportion of all countries in each exchange rate regime in each year of the sample.

- Figure 1 about here-

As is evident from the figure, the popularity of different exchange rate regimes has varied since the breakdown of the Bretton Woods-fixed exchange rate system in 1973. Many of the countries have been moving towards more flexible arrangements. The number of de facto floaters increased from 1974 to 2000 from 15 percent to 39 percent, while at the same time the proportion of countries under de facto fixed regimes decreased from 70 percent to 39 percent. In 1974, 15 percent of the countries had an intermediate regime and that share increased to 48 percent in 1994. However, this trend has been reversed since then. In 2000 the number of de facto intermediate regimes had decreased to 22 percent again.

The main focus of this paper is, however, less on the overall share of different exchange rate regimes at a specific point of time but on the persistence of different regimes. Thus, an interesting question to ask is whether there exist differences in regime persistence across different exchange rate arrangements. Following the recommendation by Kalbfleisch and Prentice (1980, p. 17) a Wilcoxon test is performed to test for the equality of survivor functions across different de facto exchange rate regimes.[13]

-Table 1 about here -

As displayed in Table 1, the test statistics strongly rejects the null hypothesis of no differences in persistence across exchange rate regimes.

Which exchange rate regime is the most persistent? In the following, non-parametric estimates are presented in order to derive meaningful statements about regime persistence. Figure 2 shows the Kaplan-Meier survival estimate for the full sample and the complete

[13] There are a variety of appropriate tests for testing the equality of survivor functions across different groups. The Wilcoxon test is the optimum rank test if one wishes to put additional weights to early failure times when the number of subjects at risk is higher and if there are no reasons to assume that the censoring pattern differs over the test groups (Kalbfleisch and Prentice 1980, 17). Nevertheless, a Log-rank test and a Tarone-Ware test were also conducted and brought identical results.

period under observation (1974-2000) conditional on the type of de facto exchange rate regime.

- Figure 2 about here -

As expressed by the figure, there is clear evidence of a longer duration of exchange rate regime pegs in comparison to intermediate and flexible arrangements. By contrast, the hazard for intermediate regimes decreases much faster indicating a lower persistence of these arrangements. Only half of the intermediate arrangements "survive" the first year; after four years no more than 6 percent continue to exist. Surprisingly enough, flexible exchange rates have an even lower persistence. Less than two fifths of the arrangements exist for more than one year, roughly one out of twenty flexible regimes keeps existing longer than four years. Figure 2 is thus only partially supportive for the two-corner hypothesis. According to this view, we would have expected both polar regimes to have a higher persistence. However, though it is evident that intermediate regimes, such as crawling pegs and bands, are not sustainable, the short persistence of flexible exchange rates contradicts the hypothesis.

One might argue that the short persistence of flexible regimes contradicts with the increasing popularity of flexible arrangements presented in Figure 1. However, this apparent puzzle is solved if one considers the fact that although developing countries are reluctant to let their currency float over a long period of time, in calm periods the "fear of floating" (Calvo and Reinhart 2000) is not as strong, and thus the country may benefit from some flexibility in its exchange rate.

It is also of interest to compare different time spans. In a second step the analysis is therefore limited to the 1990s. Given the recent process of financial liberalization, the 1990s are expected to be the most relevant time period for the validity of the two-corner hypothesis.

- Figure 3 about here -

As can be observed, the divergence between different regimes decreases when reducing the sample to the 1990s. The pattern of results changes insofar as flexible exchange rate now have a higher survivor rate (i.e., regime persistence) than before. While over the whole sample period, only 11 percent of flexible regimes exist for more than two years, this number increases to 30 percent in the 1990s. However, fixed regimes still have the highest persistence with nearly a quarter of the regimes surviving four years or longer. Again, the figure confirms the vulnerability of intermediate regimes that have the lowest survivor rate at every point in time.

Seen on the whole, the Kaplan-Meier estimator cannot provide full support for the two-corner hypothesis. Though a Wilcoxon test rejects the null hypothesis of equality in regime persistence between different exchange rate arrangements at a very high significance level, the graphical analysis shows that differences between various regimes are too small to unambiguously confirm the thesis from the "vanishing middle" (Frenkel, 1999). Rather, a characterizing feature is the low regime persistence across all regimes. This is further evidence that the de facto behavior of exchange rates does not always correspond with official announcements (which rarely change).

5.2 Results for the Cox-Estimate

The main drawback of the non-parametric analysis is that it cannot reveal great insight in terms of an explorative analysis on the influence of certain variables on the duration of exchange rate regime pegs since it makes no assumption about the fundamental form of the survivor function and the effects of covariates are not modeled either. In the following, the semi-parametric approach by Cox (1972) is used to derive conclusions about the impact of the various variables defined in Chapter 3. To try to avoid obvious multicollinearity problems, four main Cox models were fitted. Some explanatory variables are alternately dropped from regression equations. In Model A I estimate exchange rate regime duration including only political variables, whereas in Model B only economic variables are included. Model C includes the full set of covariates. Finally, Model D includes only those variables that have been found to be statistically significant in previous specifications. The statistical calculations were performed using Stata 8.0's "stcox" procedure.

The application of the Cox partial likelihood method requires that time spans of exchange rate regimes can be measured exactly, i.e. no tied failures occur. In the present case, however, tied failures exist, since only the time interval in which the abandonment of a currency peg occurs is given. To handle this problem, all estimates use the method of Efron (1977) as an approximation. This method is especially attractive if the number of failures in a specific time intervals is large (Cleves et al. 2002, 132).

When using a Cox model, it is also important to check the proportional hazard assumption. Accordingly, a Schoenfeld residual test is conducted after each estimate to verify the basic assumption of the Cox model. A violation of the proportional hazards assumption occurs when regression coefficients are dependent on time, i.e. when time interacts with one or more covariates except in ways parametrized by the model. Under the null hypothesis of

proportional hazards, a rejection of the null hypothesis indicates a violation of the proportional hazard assumption.

Finally, and as recommended by the literature on survival analysis (see, e.g. Cleves et al. 2002, 168), I use martingale residuals to check the functional form of each covariate. Each variable was plotted against the martingale residuals. The resulting linear (or nearly linear) smooth indicated in all cases a correct specification of the model.[14]

Let us now begin with the results for the maximum-likelihood estimate of the political model (Model A) presented in column 2 of Table 2.

-Table 2 about here-

The null hypothesis of $H_0 : \beta_x = 0$ respectively $H_0 : \exp(\beta_x) = 1$ can be tested against the alternative by means of a Likelihood Ratio test (LR test). This is basically a joint test of the restriction that the (exponentiated) coefficients on LEFT, RIGHT, ELECT, CBI, VETO and DEMOCRACY are all zero (one). As can be seen from the Table, the test statistic is 16.91. Under the null hypothesis this test statistic is distributed chi-square with 6 degrees of freedom. Since the statistic is above the critical 1 percent level, the hypothesis can be rejected. Hence, variables implied by the literature on the political economy of exchange rate regimes are helpful in explaining de facto exchange rate regime duration.

As expressed by the Table, patterns hypothesized in Chapter 2 are mostly born out by the data. Note that the hazard ratios are exponentiated coefficients (i.e., e^{β_i}) rather than the coefficients themselves. Thus, a hazard ratio for any β_i parameter significantly above one implies that an increase in the corresponding variable leads to a significantly faster regime shift. For example, the (statistically significant) ratio of 1.25 for VETO means that a additional veto player increases the time-to-exit for a fixed exchange rate regime by 25 percent, a results that is consistent with Hypothesis 4. For dummy variables, the exponentiated coefficients have an easy interpretation as time-ratios. In line with our hypothesis, LEFT has a significantly higher probability of abandoning a currency peg than CENTER. More exactly, the hazard at the same time for left parties is 124 percent higher than for parties from the ideological center. Surprisingly, the results also report that right parties have a higher probability of exiting from a fixed regime than center parties, though this result is not significant. Note that the exponentiated time ratios can be directly set against each other, which gives relative time ratios. Thus, the relative time ratio for a regime shift of left

[14] The plots of the running mean smoother are not displayed but are available from the author.

parties with respect to right parties is equal to $e^{\beta_2} / e^{\beta_3}$, i.e., 1.35. The hazard ratio for CBI, as a proxy for the degree of central bank independence, is also highly significant. The ratio of less than one indicates that independent central banks have a higher probability of abandoning a peg, thus suggesting a substitutive relationship between an independent central bank and a fixed regime. With respect to the electoral cycle theory, the hazard ratio of ELECT, which is well above one, supports the prior that in election years there is a higher probability of exiting from a peg. However, the result is not significant at standard levels of significance (p-value: 0.119).[15] Finally, with respect to DEMOCRACY, both the hazard ratio close to one and the high p-value indicate that the degree of more authoritarian regimes does not matter for explaining the duration of pegs. Quite importantly, as displayed in the bottom portion of the Table, the Schoenfeld residual test cannot reject the null hypothesis of proportional hazards. Thus, our specification seems to fit the data quite well.

As a second estimate only the variables suggested by the traditional OCA literature are included in the model. Column 3 in Table 2 explores the role of these criteria in determining exchange rate regime duration. The application of the LR-test for this model yields a statistic LR=20.83. Comparing the statistic with the 1 percent critical value of a chi-square distribution with six degrees of freedom indicates that the null hypothesis that no variable has any influence on fixed rate regime duration is strongly rejected by the data. As expected, INFLATION is significant indicating that countries with higher inflation have difficulties in maintaining a fixed exchange rate. Of the remaining economic variables only SDEXPORTS (as a proxy for asymmetric shocks) is significant. However, the hazard ratio of SDEXPORTS reports a puzzling value of 0.28, which contradicts the priors. This result, which has also been found by previous studies,[16] can be best explained by the measurement problem with respect to asymmetric shocks. Firstly, the standard deviation of export growth may be a poor proxy for the actual vulnerability to asymmetric shocks, since changes in export growth can also be caused by domestic factors, such as increased technological competitiveness. Secondly, there are some concerns about the measurement of the variable itself. Since no monthly data for export growth were available for all countries, the measure is not conformed every year but takes on the same value for the whole period. Thus, this specification ignores the fact that in some countries the vulnerability to asymmetric shocks might have changed significantly over the period. Another surprising result is the outcome of CAPOP that enters with a hazard ratio

[15] Pre-election and post-election specifications are not displayed. The variables were not significant, showed, however, the expected sign, i.e. there was a tendency for a lower likelihood of exiting from a currency peg prior to elections and a higher likelihood of exit afterwards.

[16] See Frieden, Ghezzi and Stein (2001) who use the terms of trade volatility as a proxy for asymmetric shocks.

well above one, suggesting that countries with capital controls have a higher probability to abandon a currency peg. Again, previous empirical work found similar results (Bernhard and Leblang 1999, Blomberg, Frieden, and Stein 2001). A possible explanation for this outcome is provided by Drazen (1997) and Glick and Hutchinson (2000). In Drazen's model, countries introduce capital controls when they are confronted with large capital outflows. This may send a negative signal to currency and financial markets and further undermines confidence and increases the likelihood of the abandonment of a currency peg. The remaining variables trade openness and foreign reserves do not seem to have any effect on fixed regime duration. Again, test statistics for the Schoenfeld residuals are displayed indicating no departure from proportional hazards.

As a third specification, the model is estimated with all explanatory variables included as covariates. The pattern of results (column 4 in Table 2) shows many similarities with the results obtained in the first two rounds. In terms of the political variables, LEFT remains significant. Left parties now have a 103 percent higher probability to exit a fixed regime at any point in time than parties from the center. The hazard ratio for RIGHT is still not significant at standard levels while the coefficient for central bank independence remains highly significant. The latter is in line with the idea of a substitutive relationship between central bank independence and exchange rate regime duration. More independent central banks are more likely to change from fixed to more flexible arrangements. Again, the hazard ratio for VETO is significant. This result provides further support for the notion that fragmented party systems are unable to make credible commitments. Finally, the hazards for DEMOCRACY and ELECT are not significant showing the same sign as in the first specification. Regarding the economic variables, the results are very similar to those presented in the pure economic model. The most important change to the previous specification is that CAPOP turns out to be significant. Note that the impact of capital controls on exchange rate regime duration is even stronger in this specification. All coefficients (except the marginal shift of OPEN) have the same sign, though only INFLATION and SDEXPORTS are significant. I therefore found no support for the hypothesis on shorter regime duration for more closed economies and for countries with a low reserve ratio. As in the previous specifications, the Schoenfeld residual test was computed for testing the null hypothesis of proportional hazards against the alternative hypothesis of non-proportional hazards. As can be seen, the null hypothesis of proportional hazards cannot be rejected.

The final estimate (see fifth column in Table 2) limits the analysis to those six variables that have been significant in the third specification. Again, the hazard ratios are close to those given above. With the exception of CAOP, all variables remain significant. The Schoenfeld residual test conforms the lack of evidence against the assumption of proportional hazards.[17]

Given the different specifications, a reasonable question to ask is which specifications fits the model best. When models are not nested, a common approach to discriminate between models is to use the Akaike Information Criterion (AIC). The AIC is given by

$$\text{AIC} = -2(\log \text{likelihood}) + 2(q+c) \tag{11}$$

where q is the number of model covariates (explanatory regressors) and c is the number of model-specific distributional parameters (Cleves et al. 2002, p. 231). If more regressors are added to the model, then the model fit improves, but the number of covariates goes up. Thus, the AIC involves a trade-off between minimizing the sum of squared errors and the number of explanatory variables. The above relationship can then be used to declare optimal that model with the lowest AIC. Table 3 presents the AIC for the four specification of the Cox model given above.

-Table 3 about here-

The Table identifies Model C as the preferred model. This specification did not only obtain the largest log likelihood but also the lowest AIC value. However, one problem with the AIC is that if several models have similar AIC values, as presently is the case, the difference is probably not of any consequence. I therefore use an additional method to assess the model fit by calculating Cox-Snell (1968) residuals. If the fitted model is correct, the Cox-Snell residuals should have a standard censored exponential distribution with hazard ratio equal to one for all t. Therefore, a plot of the cumulative hazard function (based on the Nelson and Aalen estimator) for these data should lie on a straight line from the origin with slope equal to one. Figures 4a to 4d plot the Cox-Snell residuals for the different specifications of the Cox model.

-Figures 4a, 4b, 4c, 4d about here-

The graphical analysis shows that the first two specifications provide only a poor fit of the model. In both cases, the jagged line departs clearly from the 45º benchmark line. The plots

[17] Additionally, in all three cases, a corresponding linktest was conducted. The linktest interacts analysis time with the covariates and verifies that the effects of these interacted variables are not different from zero (Cleves at al. 2000, 157). These tests also confirmed the assumption of proportional hazards at very high significance level. Results from the linktests are not displayed but are available upon request.

for Model C and Model D satisfy the exponential requirement for most of the time, especially the last specification does not fit the data too badly. Note that some deviation of the 45º line is expected due to the reduced effective sample caused by censoring (Cleves et al. 2002, p. 175). The deviation is higher in the right-hand tail of the plot where the sparseness of data reduce the adequacy of the model while the hundreds of smaller residuals in the left-hand tail of the figure cluster more closely around the straight line with slope equal to 1.

6. Conclusions

Despite a large body of work, little consensus has emerged about the determinants of exchange rate regime choice. While there are some well-established propositions about the impact of traditional OCA variables, theoretic reasoning about political and institutional determinants suggests a less systematic impact. This paper has examined political, institutional and economic determinants of exchange rate regime choice in the framework of survival analysis. The main advantage of this kind of modeling is that it allows analyzing the influence of various time-varying covariates on the duration of exchange rate regimes while taking into account previous period's regime.

The statistical analysis delivers results that can be summarized as follows: First, it has been shown that regime persistence differs considerably depending on the regime in place. Fixed exchange rates have a lower hazard than floating or intermediate regimes. However, differences between the three regimes do not seem to be large enough to unequivocally support the two-corner hypothesis. Second, evidence was presented that political and institutional factors have a non-negligible impact on the duration of pegged exchange rate regimes. The results for the partisan dummy variables are particularly impressive as left parties have a significantly higher probability of leaving a peg than parties from the ideological center. Thus, statistical analysis provided strong support for the notion that different parties have different preferences in terms of the exchange rate regime. Additionally, the number of veto players and the degree of central bank independence was significant in both specifications indicating that more veto players make it more difficult to credibly commit to an exchange rate peg and that more independent central banks are more likely to exit from a currency peg. These political and institutional differences may help to explain why some countries have maintained fixed exchange rates and others not. In particular, the analysis might provide an explanation why economically comparable countries choose different exchange rate regimes.

References

Aboal, D., D. Calvo, and N. Noya (1999), El Ciclo Político Económico en el Uruguay de las últimas Ocho Décadas, Paper presented at the XIV Jornadas Anuales de Economía del Banco Central de Uruguay.

Alesina, A. (1987), Macroeconomic Policy in a Two-Party System as a Repeated Game, Quarterly Journal of Economics, Vol. 102 (August), pp. 651-678.

Alesina, A. and L. H. Summers (1983), Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence, Journal of Money Credit and Banking, 25, pp. 157-162.

Asadurian, T., and W. R. Clark (2003), The Substitutability of Monetary Commitments and The Role of Veto Players, Paper presented at the 61st Annual Meeting of the Midwest Political Science Association, April 3-6.

Assael, P., and F. Larrain (1994), El Ciclo Político-Económico: Teoría, Evidencia y Extensión para una Economía Abierta, Cuadernos de Economía, 31: 87-113.

Barro, R., and D. Gordon (1983), A Positive Theory of Monetary Policy in a Natural Rate Model, Journal of Political Economy, No. 91, pp. 589-610.

Beck, T., G. Clarke, A. Groff, P. Keefer, and P. Walsh (2001), New Tools in Comparative Political Economy: The Database of Political Institutions, 15:1, pp. 165-176 (September), World Bank Economic Review, version 3.

Begg, D., B. Eichengreen, L. Halpern., J. v. Hagen, and C. Wyplosz (2001), Sustainable Regimes of Capital Movements in Accession Countries, Centre for Economic Policy Research, Policy Report, No. 10.

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, CESifo Institute, Munich.

Bernhard, W., J. L. Broz, and W. R. Clark (2002), The Political Economy of Monetary Institutions, International Organization, 56(4), pp. 693-723.

Bernhard, W., and D. Leblang (1999), Democratic Institutions and Exchange Rate Commitments, International Organization, 53(1), pp. 71-97.

Bienen, H., and N. van de Walle (1991), Of Time and Power: Leadership Duration in the Modern World, Stanford, CA: Stanford University Press:

Blomberg, S. B., J. A. Frieden, and E. Stein (2001), Sustaining Fixed Rates: The Political Economy of Currency Pegs in Latin America, Economic Departments Working Paper, No. 06/01, Wellesley College, Welesley, MA.

Bofinger, P., and T. Wollmershäuser (2001), "Options for the Exchange Rate Policies of the EU Accesion Countries (and other Emerging Market Economies)", CEPR Discussion Paper Nr. 2379, London.

Bonomo, M., and C. Terra (2001), Elections and Exchange Rate Policy Cycles, Getulio Vargas Foundation, October.

Broda, C., and C. Tille (2003), Coping with Terms-of-Trade Shocks in Developing Countries, Current Issues in Economics and Finance, 9(11), Federal Reserve Bank of New York.

Broz, J. L. (2002), Political System Transparency and Monetary Commitment Regimes, International Organization, 56(4), pp.863-889.

Broz, J. L., and J. Frieden. (2001), The Political Economy of International Monetary Relations, Annual Review Political Science, pp. 317-43.

Calderón, C., and K. Schmidt-Hebbel (2003), Macroeconomic Policy and Performance in Latin America, Paper presented at the workshop on "Monetary Policy and Macroeconomic Stabilization in Latin America ", Kiel Institute for World Economics, 11-12 September, Kiel.

Calvo, G. A., and C. M. Reinhart (2000): Fixing for Your Life, NBER Working Paper, No. 8006, National Bureau of Economic Research, Cambridge/MA.

Calvo, G. A., and C. Végh (1999), Inflation Stabilization and BOP Crises in Developing Countries, NBER Working Paper, No. 6925, National Bureau of Economic Research, Cambridge, MA..

Clark, W. R. (2002), Checks and Balances, Private Information, and the Credibility of Monetary Commitments, International Organization, 56(4), pp. 725-749.

Cleves, M., W. W. Gould, and R.G. Gutierrez (2002), An Introduction to Survival Analysis Using Stata, Stata Press Publications, College Station, Texas.

Collins, S. M. (1996), On Becoming More Flexible: Exchange Rate Regimes in Latin America and the Caribbean, Journal of Development Economics, 51, pp. 117-138.

Cooper, R. (1971), Currency Devaluations in Developing Countries, Essays on International Finance, No. 86, Princeton University, Princeton, NJ.

Cox, D. R. (1972), Regression Models and Life-Tables, Journal of Royal Statistical Society. Series B, No. 34, pp.187-220.

Cox, D. R., and E. J. Snell (1968), A General Definition of Residuals (with Discussion), Journal of Royal Statistical Society, Series B, No. 30, pp. 248-275.

Cukierman, A. (1992), Central Banking Strategy, Credibility, and Independence: Theory and Evidence, Cambridge/London: The MIT Press.

De Haan, J., and W. J. Kooi (1998), Does CBI Really Matter? New Evidence for Developing Countries Using a New Indicator, University of Groningen , mimeo.

Diehl, M., and R. Schweickert (1997), Wechselkurspolitik im Aufholprozess – Erfahrungen lateinamerikanischer, europäischer und asiatischer Länder, Kieler Studien No. 286, Tübingen: Mohr Siebeck.

Drazen, A. (1997), Policy Signalling in a Open Economy, NBER Working Paper No. 5892, National Bureau of Economic Research, Cambridge, MA.

Drazen, A. (2000), Political Economy in Macroeconomics, Princeton University Press, Princeton.

Edwards, S. (1996), The Determinants of the Choice between Fixed and Flexible Exchange Rate Regimes, NBER Working Paper No. 5756, National Bureau of Economic Research, Cambridge, MA.

Edwards, S., and E. Levy Yeyati (2003), Exchange Rates as Shock Absorbers, NBER Working Paper, No. 9867, Cambridge, MA.

Efron, B. (1977), The Efficiency of Cox's Likelihood for Censored Data, Journal of the American Statistical Association, No. 72, pp. 557-565.

Eichengreen, B. (2001), Capital Account Liberalization: What Do the Cross-Country Studies Tell Us?, The World Bank Economic Review, No. 15(3), pp. 341-365.

Eichengreen, B., and D. Leblang (2003), Exchange Rates and Cohesion: Historical Perspectives and Political-Economy Considerations, Journal of Common Market Studies, Special Issue, No. 41(5), pp.797-813.

Eijffinger, S. C. W., and J. de Haan (1996), The Political Economy of Central Bank Independence, Special Papers in International Economics No. 19 (May), International Finance Section, Department of Economics, Princeton University.

Frankel, J. (1999), No single currency regime is right for all countries or at all times, Essays in International Finance No.215, Princeton University, Princeton, NJ

Freytag, A. (2002), Choice of an Exchange Rate Arrangement, Institutional Setting and Inflation: Empirical Evidence for Latin America, OECD Development Centre Technical Paper No. 198.

Frieden, J. A., P. Ghezzi, and E. Stein (2001), Politics and Exchange Rates: A Cross-Country Approach, in: J.A. Frieden, E. Stein (eds.): The Currency Game – Exchange Rate Politics in Latin America, Inter-American Development Bank, Washington, DC, pp. 21-64.

Gärtner, M., and H. Ursprung (1989), Politische und Ökonomische Gesetze flexibler Wechselkurse, Jahrbuch für Neue Politische Ökonomie 8, pp.. 109-125.

Ghosh, A., A. M. Gulde, and H. Wolf (2002), Exchange Rate Regimes: Classification and Consequences, MIT Press.

Giavazzi, F., and M. Pagano (1988),The Advantage of Tying One`s Hands: EMS Discipline and Central Bank Credibility, European Economic Review, 32, pp. 1055-1075.

Glick, R., and M. Hutchinson (2000), Stopping Hot Money or Signalling Bad Policy? Capital Controls and the Onset of Currency Crises; Federal Reserve Bank of San Francisco and University of California, Santa Cruz.

Goodell, G. (1985), The Importance of Political Participation for Sustained Capitalist Development, Archives Européennes de Sociologie, 26(1),pp. 93-127.

Grilli, V., D. Masciandaro, and G. Tabellini (1991), Institutions and Politics, Economic Policy, 6, pp. 341-391.

Hayo, B. (1998), Inflation culture, central bank independence and price stability. European Journal of Political Economy, 14, pp. 241-263.

Hefeker, C. (1996), The Political Choice and Collapse of Fixed Exchange Rates, Journal of Institutional and Theoretical Economics, 152, pp. 360-79.

Hefeker, C. (2000), Sense and Nonsense of Fixed Exchange Rates: On Theories and Crises, Cato Journal, Vol. 20, No. 2 (Fall 2000).

Hibbs, D. A. (1977), Political Parties and Macroeconomic Policy, American Political Review, 71, pp. 1467-1487.

IMF (1997), Exchange Rates and Economic Performance in Developing Countries, World Economic Outlook, Chapter IV, pp. 78-97. October, International Monetary Fund, Washington, DC.

IMF, International Financial Statistics, various issues, International Monetary Fund, Washington, DC.

IMF, International Monetary Fund, Annual Report on Exchange Rate Arrangements and Exchange Restrictions, various issues, Washington, DC.

Juhn, G., and P. Mauro (2002), Long Run Determinants of Exchange Rate Regimes: A Simple Sensitivity Analysis, IMF Working Paper No. 104, International Monetary Fund, Washington, DC.

Kalbfleisch, J. D., and R. L. Prentice (1980), The Statistical Analysis of Failure Time Data, Wiley.

Kaplan, E., and P. Meier (1958), Nonparametric Estimation from Incomplete Observations. Journal of the American Statistical Association 53, pp. 457–481.

Keefer, P., and D. Stavasage (2002), Checks and Balances, Private Information, and the Credibility of Monetary Commitments, International Organization, Vol. 56, No. 4, pp. 751-774.

Kenen, P. B. (1969), The Theory of Optimal currency areas: An Eclectic View, in: Mundell/ Swoboda (Hrsg.), Monetary Problems of the International Economy, Chicago, pp. 41-60.

Kiefer, N. (1988), Economic Duration Data and Hazard Functions, Journal of Economic Literature, 16, pp.646-679.

Klein, M., and N. Marion (1997), Explaining the Duration of Exchange Rate Pegs, Journal of Development Economics, Vol. 54 (December), pp. 387-404.

Kraay, A. (1998), In Search of the Macroeconomic Effects of Capital Account Liberalization, unpublished manuscript, The World Bank (October).

Krugman, P. (1995), What Do We Need to Know About the International Monetary System?, in: P.B. Kenen (ed.), Understanding Interdependence, Princeton: Princeton University Press, pp. 509-30.

Krugman, P. (1979), A Model of Balance of Payments Crises, Journal of Money, Credit and Banking, No. 11, pp. 311-25.

Kydland, F., and E. Prescott (1977), Rules Rather than Discretion: The Inconsistency of Optimal Plans, Journal of Political Economy, No. 85, pp. 473-492.

Levy Yeyati, E., and F. Sturzenegger (2002), Classifying Exchange Rate Regimes: Deeds vs. Words, unpublished, Buenos Aires, Universidad Torcuato Di Tella.

Lewis-Beck, S. M., and M. Stegmaier (2000), Economic Determinants of Electoral Outcomes, Annual Review of Political Science, No. 3, pp.183-219.

Marshall, M. G: and K. Jaggers (2003), Polity IV Project, Political Regime Characteristics and Transitions, 1880-2002, Dataset Users Manual, Integrated Network for Societal Conflict Research (INSCR), University of Maryland, Maryland.

Masson, P. R. (2001), Exchange Rate Transitions, Journal of Development Economics, 64 (April), pp. 571-586.

McKinnon, R. (1963*),* Optimum Currency Areas, in: American Economic Review, No. 53, pp. 717-725.

Mundell, R. (1961), A Theory of Optimum Currency Area, in: American Economic Review, No. 51(4),pp. 657-665.

Nordhaus, W. (1975), The Political Business Cycle, Review of Economic Studies, 42 (5), pp. 169-190.

Poirson, H. (2001), How Do Countries Choose their Exchange Rate Regime?, IMF Working Paper 01/46, International Monetary Fund, Washington, DC.

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

Rogoff, K. (1985), The Optimal Degree of Commitment to an Intermediate Monetary Target, Quarterly Journal of Economics, 110, pp. 1169-1189.

Rogoff, K. (1990), Equilibrium Political Business Cycles, American Economic Review, 80, pp. 21-36.

Rogoff, K., and A. Sibert (1988), Elections and Macroeconomic Cycles, Review of Economic Studies, 55, pp. 1-16.

Roubini, N., and J. Sachs (1989), Political and Economic Determinants of the Budget Deficits in Developing Countries, European Economic Review 33, pp. 903-938.

Schamis, H. E., and C. R. Way (2001), The Politics of Exchange Rate –Based Stabilization, Paper presented at the 97th Annual Meeting of the American Political Science Association, August 29- September2.

Setzer, R. (2003), Chancen und Risiken einer Dollarisierung in Argentinien, Zeitschrift für Wirtschaftspolitik, 52(1), pp. 56-83.

Siermann, C. (1998); Politics, Institutions and the Economic Performance of Nations, Edward Elgar, Cheltenham, UK.

Simmons, B. A. (1997), Who adjusts? Domestic sources of foreign economic policy during the interwar years 1924-1939, Princeton, Princeton University Press.

Stein, E. H., and J. M. Streb (1998), Political Stabilization Cycles in High Inflation Economies, Journal of Development Economics 56(1), pp. 159-180.

Swank, D. (1998), Funding the Welfare State: Globalization and the Taxation of Business in Advanced Market Economies, Political Studies XLVI, pp. 671-692.

Tsebelis, G. (1995), Veto Players and Law Production in Parliamentary Democracies, in H. Döring (ed.), Parliaments and Majority Rules in Western Europe, St. Martin's Press.

Tudela, M. M. (2001), Explaining Currency Crises: A Duration Model Approach, Centre for Economic Performance, CEP Discussion Paper, No. 487, Centre for Economic Performance.

Appendix

Figure 1: De Facto Exchange Rate Regimes 1974-2000

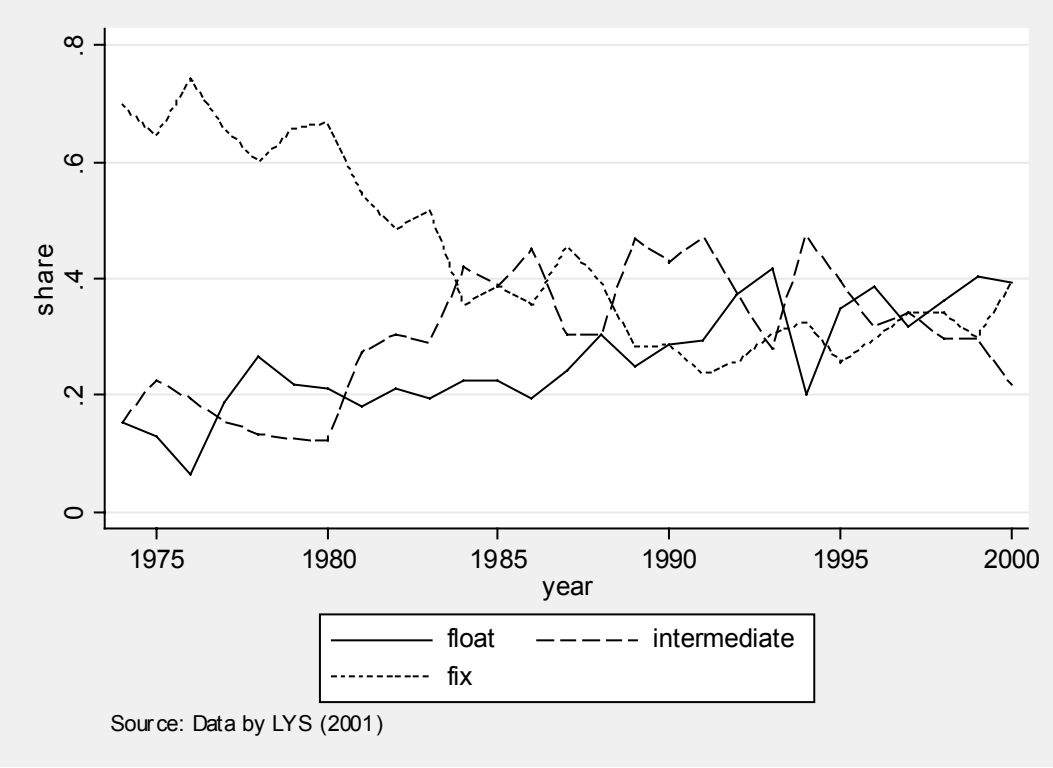


Table 1: Wilcoxon Test for equality of survivor functions across exchange rate regimes

Exchange Rate Regime	Events observed	Events expected	Sum of ranks
Float	92	88.26	287
Intermediate	144	104.56	1496
Fix	89	132.18	-1783
Total	325	324.00	0
Chi(2)	55.44		
Pr>chi2	0.000		

Figure 2: Kaplan-Meier survival estimates, 1974-2000

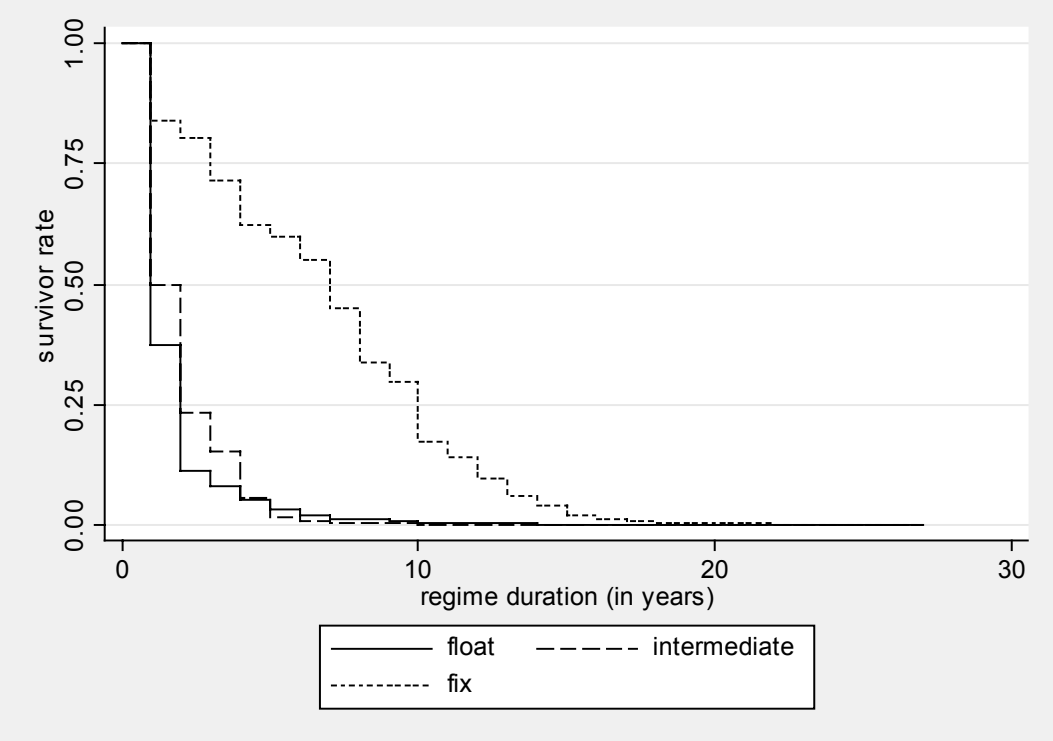


Figure 3: Kaplan-Meier survival estimates, 1991-2000

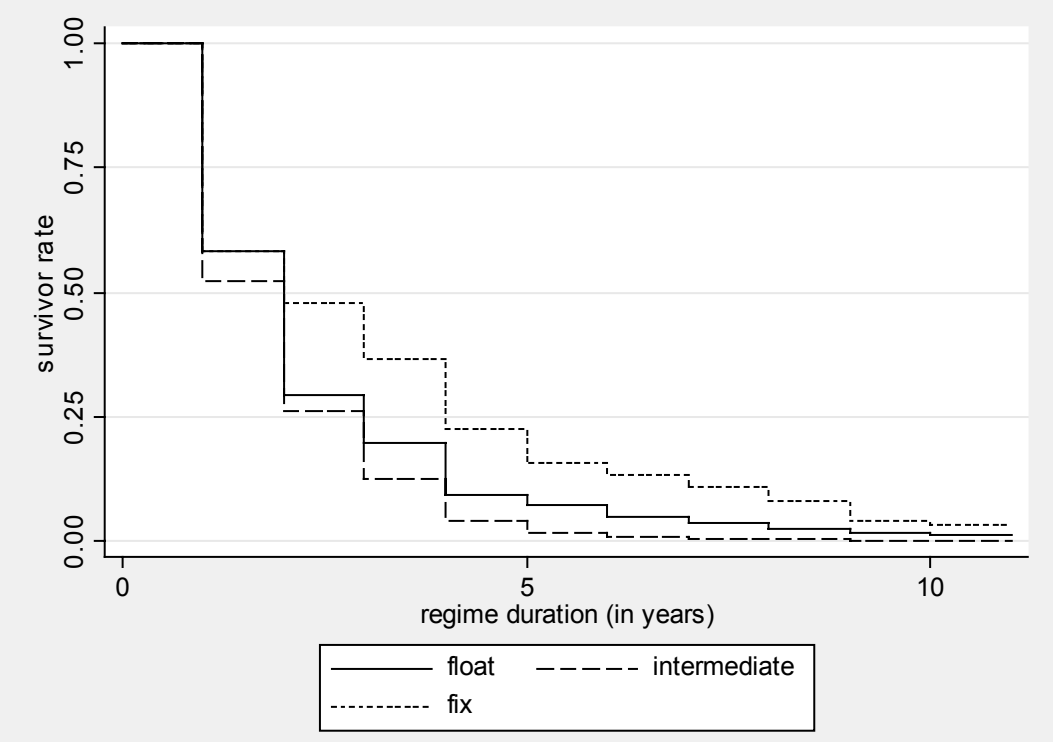


Table 2: Maximum-Likelihood Estimates

Variable	Model A	Model B	Model C	Model D
LEFT	2.236** (0.763)		2.028* (0.861)	1.677* (0.500)
RIGHT	1.649 (0.512)		1.288 (0.454)	
ELECT	1.635 (0.516)		1.596 (0.587)	
CBI	0.223** (0.155)		0.145** (0.124)	0.172** (0.128)
VETO	1.252* (0.150)		1.387** (0.205)	1.200* (0.122)
DEMOCRACY	0.989 (0.262)		0.969 (0.028)	
INFLATION		1.359** (0.133)	1.284** (0.145)	1.385*** (0.131)
SDEXPORTS		0.280** (0.140)	0.300** (0.174)	0.298*** (0.132)
OPEN		0.999 (0.035)	1.006 (0.040)	
CAPOP		1.442 (0.416)	1.847* (0.617)	1.514 (0.436)
RESERVES		1.652 (0.627)	1.602 (0.630)	
RESLOW		1.011 (0.453)	1.456 (0.819)	
LR chi2	16.91	20.83	27.51	31.26
Prob<Chi2	0.009	0.002	0.006	0.000
Schoenfeld test	0.552	0.247	0.153	0.126
No. of failures	71	67	61	68
No. of observ.	271	259	204	254

*, **, *** indicate significance at the 10%, 5%, 1% level respectively.

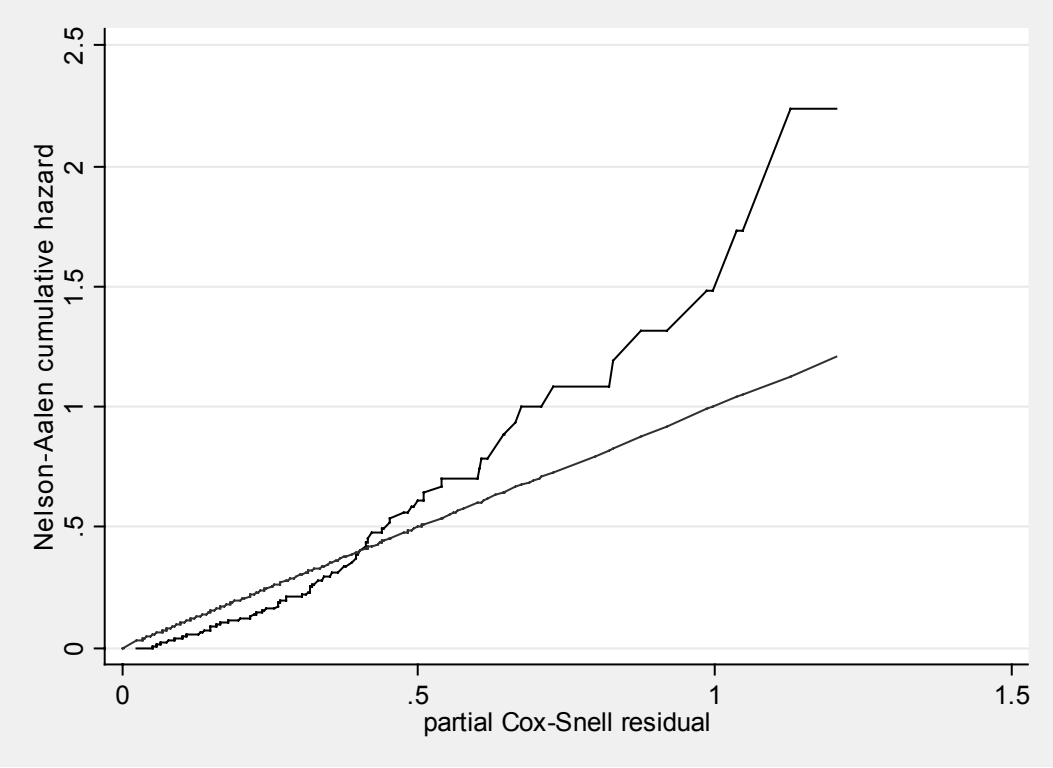
Standard deviations are reported below each value in brackets.

Table 3: Calculation of Akaike Information Criterion (AIC)

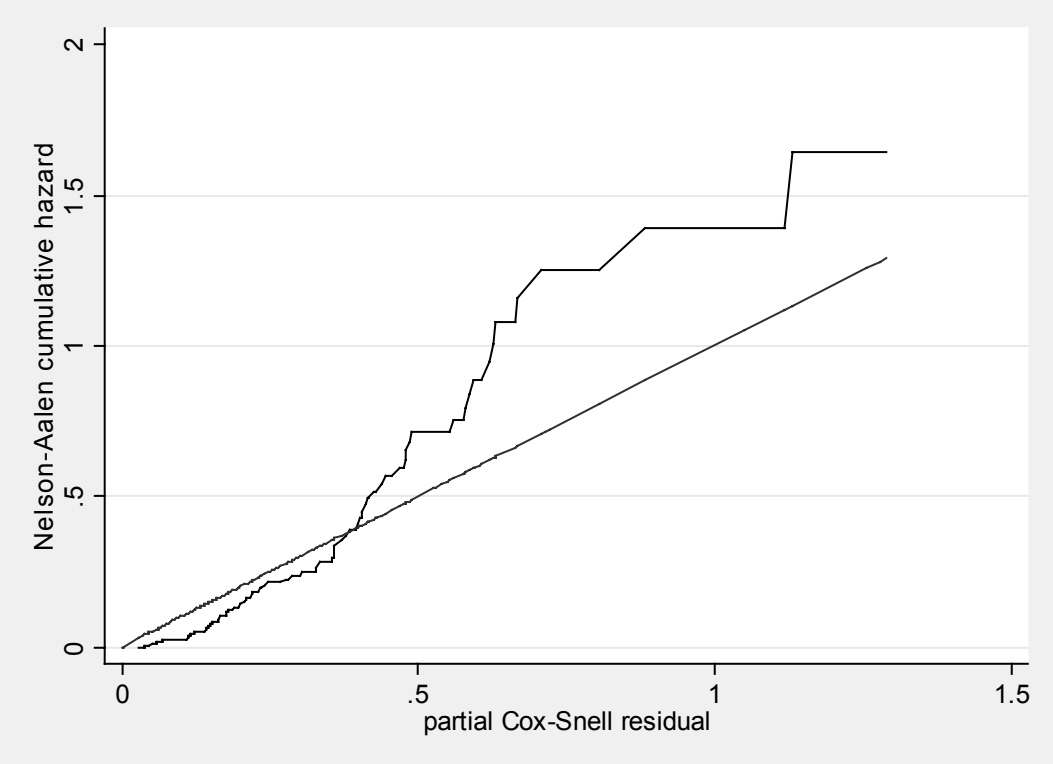
	Log likelihood	q	c	AIC
Model A	-142.202	6	1	298.404
Model B	-134.639	6	1	283.278
Model C	-101.178	12	1	228.356
Model D	-129.689	6	1	273.378

Figure 4: Cumulative hazard functions of Cox-Snell residuals

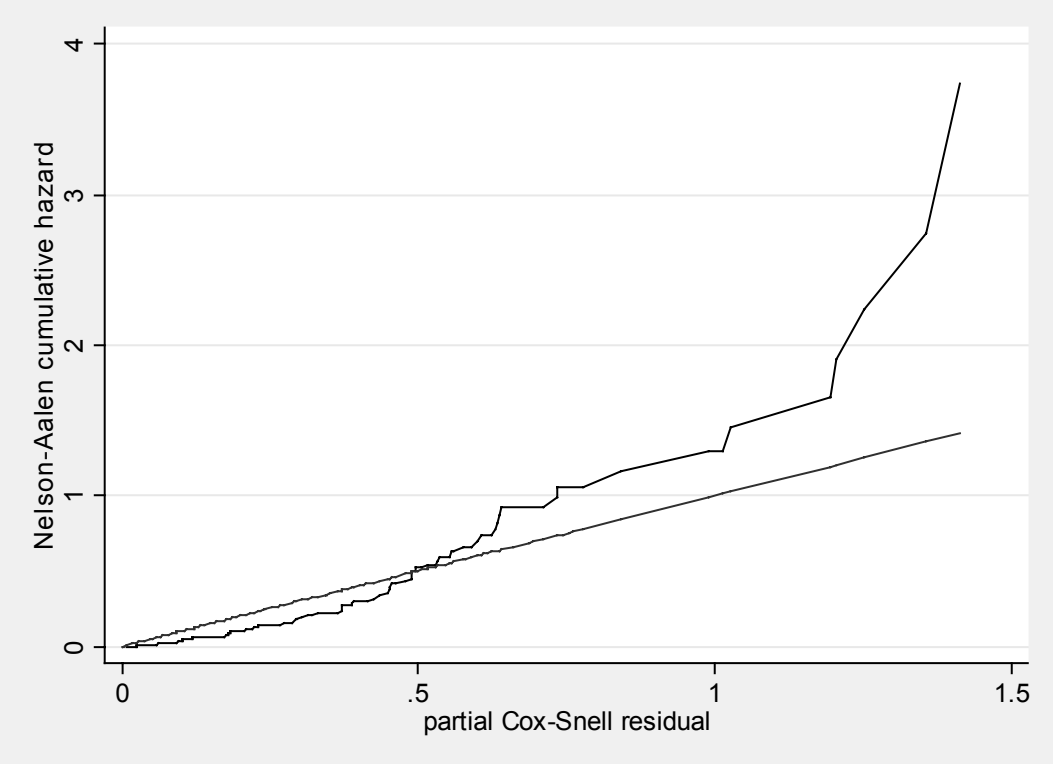
a) Model A



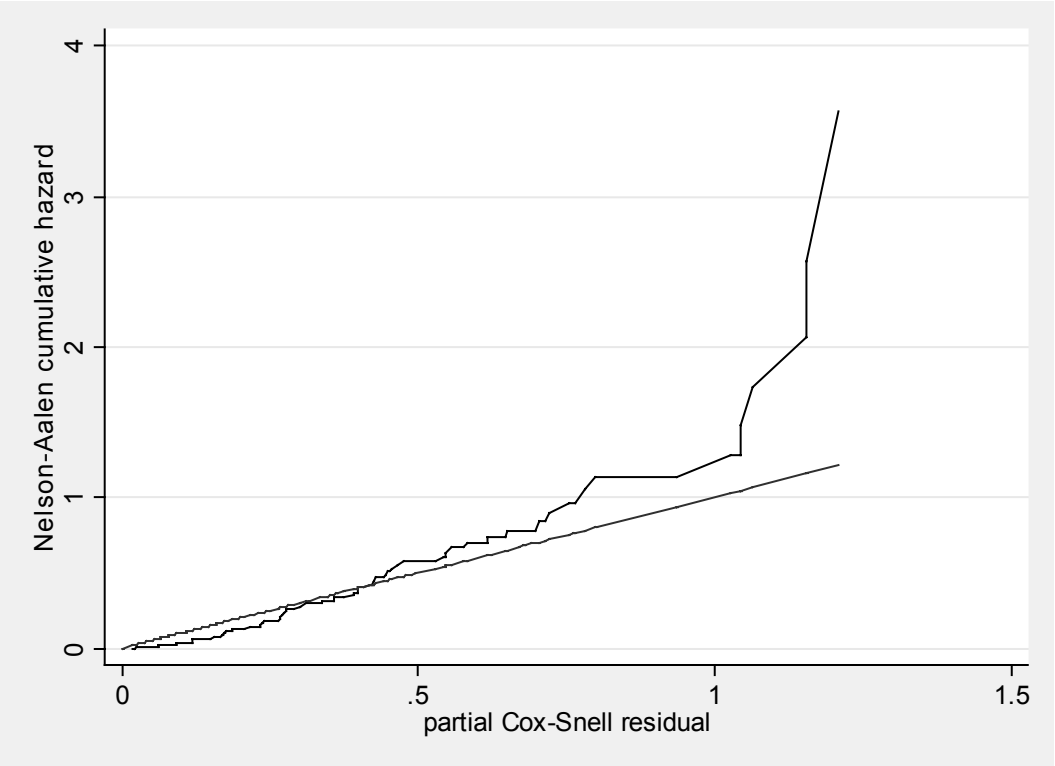
b) Model B



c) Model C



d) Model D


Nelson-Aalen cumulative hazard
0
1
2
3
4
0
.5
1
1.5
partial Cox-Snell residual