May 2, 2007
Preliminary Draft

Exchange Rate Regimes, Openness, and Central Bank Independence

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Prepared for the Frontiers In Central Banking conference at the National Bank of Hungary, Budapest, Hungary, May 10-12, 2007. An earlier version of parts of this paper written by Willett was presented at the 2001 Annual Meeting of the American Political Science Association, San Francisco, August 30-September 2, 2001.

1. Introduction

There has been considerable debate about the comparative advantage and disadvantages of external versus domestic approaches to providing macroeconomic discipline. The major focus of this paper is on evaluating possible external source of discipline, specifically capital mobility, trade openness, and fixed and pegged exchange rate regimes and how these may interact with domestic central bank independence. The thrust of our argument is that except where countries closely meet the optimum currency area condition for fixed rates to be optimal, these external sources of discipline are often unlikely to be very effective and that in several types of cases they may even act to reduce rather than increase domestic discipline.

Hard fixes provide a constraint over domestic monetary policy in the long run, and with sufficiently high capital mobility this constraint can apply in the short run as well. The same does not hold with respect to fiscal policy, however. Here the emphasis needs to be on the effects on incentive structures, especially because in the short run, fixed rates can make budget deficits easier to finance. With high capital mobility under fixed rates fiscal policy can also force monetary expansion, even if the central bank is politically independent. In such cases, a fixed rate regime does not provide a binding constraint over short run macroeconomic behavior, it only raises the long run costs of short run expansion. Whether such prospective future costs will be sufficient to reduce the incentives for short run manipulation will depend on officials' discount rate. Since soft fixes flatten the short-run inflation – unemployment tradeoff compared to flexible rates, the short run effects of unanticipated expansion become more politically attractive and the shadow of the future will be even less effective.

It is quite ironic that many disinterested advocates of such strategies have failed to recognize that with such a time profile of early benefits and later costs of expansionary domestic

policies and the initial costs and delayed benefits of contractionary policies, soft as opposed to hard pegs cannot be expected to be a very effective way to overcomethe resulting time inconsistency problems. Indeed while a genuinely fixed rate would put an effective constraint on the inflationary bias resulting from the time inconsistency problems of discretionary domestic macro policy, a temporary peg could well increase rather than reduce this bias.

A major focus of this paper is a comparison of domestically based discipline strategies in the form of inflation targeting implemented by an independent central bank versus external discipline in the forms of capital mobility and limitations on exchange rate flexibility. We approach this issue by first showing that the discipline effects of pegged exchange rates and international capital flows are often overstated. We conclude that such externally based strategies do not have general superiority over domestically based strategies. Like the general issue of fixed versus flexible rates, the relative costs and benefits of externally versus internally based discipline strategies should therefore depend on the considerations enumerated in the theory of optimal currency areas. The paper also considers transparency arguments concerning the two approaches.

Section 2 offers an overview of issues concerning time inconsistency problems and the need for internal or external sources of discipline to overcome these biases. The discussion emphasizes the importance of distinguishing between constraint and incentive effects. Section 3 analyzes the effects of fixed rates and capital mobility in terms of their constraint and incentive effects on domestic monetary and fiscal policy. Section 4 considers the effects of exchange rate regimes on inflation-unemployment tradeoffs and critiques the analysis presented by David Romer (1993), who argues that high levels of openness will provide strong discipline effects over inflationary tendencies. We argue that his argument in fact only holds for flexible, not pegged exchange rates. In section 5, we present new empirical evidence on the discipline effects of alternative exchange

rate regimes, stressing the importance of distinguishing between hard and soft fixes. In section 6, we distinguish between the constraint and optimal policy rate approaches and explain why optimum currency area analysis is of crucial importance for the considerations of external versus internal approaches to discipline. Section 7 concludes.

2. An Overview of Time Inconsistency Issues and the Importance of Distinguishing Between Constraint and Incentive Effects

Arguments for fixed exchange rate regimes such as the gold standard as a source of discipline against inflationary policies have a long history. The inflationary excesses of the 1970s combined with theoretical analysis of time inconsistency and political business cycles reinforced widespread concerns that unconstrained domestic monetary and fiscal policies may generate inflationary biases.[1] These literatures point to mechanisms which generate incentives for governments to engage in policies which bring short term economic and political benefits at the cost of longer term economic instability. The driving force in these analyses of the incentives for political business cycles and time inconsistency problems more generally is the difference between short-term and longer term inflation-output relationships. In the short run, unless policies are fully anticipated or wages and prices are fully flexible, the Phillips curve trade-off will be much flatter than in the longer term. Since quantities tend to adjust more quickly to expansionary policies than prices, the short run effects of expansions tend to be more favorable than the longer term ones. At the same time, the short-run effects of tightening policy will be less favorable than the longer-term effects. As a consequence, if the political process operates with a relatively short time horizon, this incentive structure is likely to generate an inflationary bias and excessive instability.

[1] See, for example, the analysis and references in Drazen (2000), Willett (1988), and Willett and Keil (2004).

Learning by the public should dampen those incentives, as is emphasized in the rational expectations literature, but the public choice concept of rational ignorance suggests strong limits on the speed and power of this learning process as far as the median voter is concerned.[2] As a consequence, considerable support has developed in official circles as well as among economists for the adoption of institutional mechanisms to restrain such tendencies. On the domestic front this has been reflected in a broad movement toward greater independence for central banks, the adoption of inflation targeting, and a considerable debate over whether the implementation of measures to limit fiscal deficits is useful.[3] On the international side, there has been considerable interest in, and use of, fixed or pegged exchange rates as nominal anchors for the domestic price level (or at least for rates of inflation).

On the domestic side, there has been considerable advance in our understanding of issues surrounding central bank independence and inflation targeting. It has been made clear that proponents of central bank independence were not advocating independence for unelected officials to do whatever they wanted. The objective was to provide independence from short-term political pressures to pursue excessively expansionary policies. As the view, that Keynesian short-run inflationary-unemployment tradeoffs morph over the medium and longer term into a vertical or even backward bending tradeoff curves, received growing theoretical and empirical support, the debate shifted from prioritizing the 'inflation versus unemployment and growth'- trade-off to recognition that the relevant tradeoffs was primarily intertemporal. While not all politicians (and even not all economists) have accepted this view, the idea that policymakers can generate better short-run economic performance through expansionary monetary and fiscal policies, but typically

[2] See Willett and Banaian (1988).
[3] Probably the best known fiscal limitation is the regional one adopted in the Mastricht Treaty which set the stage for European Monetary Union and the subsequent Growth and Stability Pact. For a political economy perspective and references to the debate see Willett (1999).

only at the cost not only of higher inflation and slower growth at a later point in time, has become quite mainstream ..[4]

Central bank independence has been suggested as a solution to this time-inconsistency problem. However, by highlighting the many channels through which political pressure can be brought to bear on formally independent monetary authorities, a rich political economy literature on central bank independence has stressed that formal institutional independence is not sufficient by itself to guarantee effective operational independence.

There has been an at least equally large literature on external methods of promoting discipline, but on the whole this literature has been less sophisticated in its analysis of the political economy issues involved. While the domestic literature on domestic commitment mechanisms has not been devoid of examples of the economists tendency "to assume an effectively independent central bank," this has been much more common in the literature on exchange rates as nominal anchors and exchange rate based stabilizations. A series of theoretical arguments about time inconsistency problems and the successful disinflation in Europe during the 1970s under the European Monetary System resulted in substantial expert support for the use of exchange rates as nominal anchors. Advocacy for such currency strategies spread from academic research to recommendations by IMF, which were subsequently implemented by a number of countries. However, much of the literature on this topic in the 1980s and 1990s treated the adoption of fixed rates as a fully credible commitment device and often failed to distinguish sufficiently clearly between the credibility effects of hard fixes and softer pegs (see for example Sachs 1996). The result was a tendency to oversell the benefits of exchange-rate based stabilization strategies.[5] The short-run effects of such strategies were typically excellent, with rapid drops in inflation and often

[4] For recent empirical evidence and references to the literature, see Burdekin et al. (2004).
[5] For critical analysis of this literature see Westbrook and Willett (1999) and Willett (1998).

economic booms rather than recessions. The longer-term record proved to be much poorer, however; currencies frequently became overvalued, and experiments such as Mexico's ERBS program or Argentina's currency board that looked quite successful over the first few years ended in major crises.

The mixed record of exchange rate based stabilization efforts have led some prominent economists such as Jeffrey Sachs (1996) to recommend temporary pegs as an aid for domestic stabilization. The problem of exiting from such temporary pegs before severe crises occur is quite serious, however. With a temporary peg, whether constant or crawling, there is a time asymmetry in the effects of adjusting the parity under downward pressure. The initial effects of a discrete devaluation or rapid depreciation on inflation and the blow to prestige and/or credibly tend to show up quickly, while the benefits of improved trade balance, increasing output, and declining unemployment tend of show up with substantially longer lags. Where the political process operates with a short time horizon – for example in the run-up to elections – this gives the authorities an incentive to delay needed depreciations and results in a tendency for currencies to be overvalued and eventually crash (Chiu and Willett (2006) and Willet (2007)). On the other hand, the initial effects of pegging are likely to be quite favorable. With this time profile skewed toward early benefits and delayed costs, it is easy to see how exchange rate based stabilization has proven to be quite popular with many national governments (Schamis and Way 2003).

A. Constraint vs. Incentive Effects

A central theme of this paper is the need to distinguish between the constraint and incentive effects of different discipline mechanisms. A substantial portion of the recent literature on external sources of discipline focuses exclusively on the role of external factors as constraints over domestic

policy behavior. We will argue that in many, if not most, cases this constraint view is misleading, and that what is relevant is influences on incentives.

The argument is similar in spirit to that of Bates et al. (1998) who argue that "institutions do not impose constraints; the order they provide emerges endogenously. Institutions rest upon credible promises, of either reward or punishment. They therefore can and should be analyzed as the equilibria of extensive form games" (p. 5). A formal game theoretic analysis will not be presented, but the importance of the approach suggested in Bates et al. will, we hope, be amply illustrated. Far too often in the analysis of issues such as the effects of the European Monetary System on disinflation, analysts took formal models of credible commitment techniques and then applied them without qualification to situations where the commitment mechanisms in question were far from fully credible.[6]

We use constraint in the normal sense of something which cannot be violated. Most often external discipline is discussed in terms of a fixed exchange rate. Frequently, however, analyses do not make clear whether the fixed rate is "permanent" such as the gold standard under which only a major catastrophe would force a country from its fixed rate, or whether it is more of a Bretton Woods type adjustable peg. For most purposes we can consider the former case as a genuine constraint, but the latter is not. By increasing the cost of depreciation it could impose discipline in the short-term and generate favorable credibility effects, but this needs to be analyzed as influencing government incentives, not as operating as a constraint. As we will discuss below,,

[6] See Westbrook and Willett (1999). In its initial stages the European Monetary System was not a system of fixed exchange rates as it was often modeled and nominal anchor considerations were not paramount. Indeed, the EMS was specifically designed to avoid the excessive stickiness of the adjustably pegged exchange rates of the Bretton Woods system which contributed so much to the breakdown of its exchange rate regime in the early 1970s. In its early days, exchange rate pegs in the European Monetary System were changed quite frequently, and they were intended to be. It was only in the mid 1980s that parity adjustments became strongly discouraged. As a consequence it is not surprising that the initial empirical studies generally failed to find evidence of the credibility effects posited in the theatrical models. Indeed, had such effects been found, it would have been quite disturbing for economic theory.

pegged rates can increase the short run political benefits as well as the longer term political costs of less than fully anticipated monetary expansions. The net effect will depend crucially on the government's discount rate. Since elected officials' short time horizons are a primary cause of the time inconsistency problems that generate inflationary biases, using a mechanism that presupposes a low discount rate to impose discipline does not seem an attractive approach.

The same type of argument holds with respect to the effect of even hard fixes of the exchange rate on fiscal policy. While the fix may be viewed as a constraint on independent monetary policy it clearly only affects incentive structures, and not constraints, with respect to fiscal policy. And as with the effects of pegged rates on monetary policy, the effect could go either way. The fixed rate will increase the future costs of continued fiscal deficits, but in the short run it may lower the financing costs of deficits. The same is true of high international capital mobility. Thus for governments with a short time horizon, fixed rates may reduce short-run fiscal discipline.

A fixed exchange rate clearly places a long run constraint on domestic monetary policy unless the country in question has some method of running payments imbalances indefinitely. Where capital mobility is perfect, then fixed rates will operate as a constraint on domestic monetary policies in the short-term as well. But where international capital mobility is imperfect, then sterilized intervention becomes feasible and the fixed rate operates only as a long term, not short-term constraint. Thus, even with a hard fix, incentive rather than constraint analysis will be relevant for short term behavior. In this case, the long run constraint could eliminate a long term inflationary bias and by doing so increase the costs of short run time inconsistent behavior, but it would not eliminate the possibility of short-run political business cycles. Again, in this case, it is important to look carefully at effects on incentive structures, not just assume an effective constraint on time inconsistent behavior.

B. Domestic and External Mechanisms Can Be Complements or Substitutes and Sometimes Fixed Rates Can Undercut Central Bank Independence

In general, as we know from the theory of economic policy, uncertainty makes it optimal to use more policy instruments where possible. By the same token, with imperfect effectiveness or credibility, it may be desirable to use multiple institutions.[7] For example, the fiscal limitations imposed by the European Growth and Stability Pact were not redundant, even though the European central bank was independent. It would only have been redundant if the ECB's independence had been effective from the beginning (Willett 1999). In general new constitutions, no matter how well designed, are unlikely to enjoy full credibility from the start. From this perspective, a major argument for the Growth and Stability Pact was as an aide to the establishment of the credibility of the ECB.

Arguments about the desirability of multiple institutions assume, however, that the addition of another system does not interfere with the operation of the first. But we know that in general, monetary policy cannot target both the (rigid) exchange rate and the domestic price level. While hard fixes and central bank independence may be substitutes, as analyzed in some of the recent political science literature (see the contributions in the special edition of International Organization edited by Bernhard et al. (2002)) with softer commitments, exchange rate targeting and central bank independence are more likely complements. If the commitment to exchange rate targeting has some degree of flexibility, then central bank independence becomes important for the effective implementation of exchange rate policy between the poles of hard fixes and freely floating rates, as well as inflation targeting. Since discretionary exchange rate management is subject to important

time asymmetry problem, where a pegged exchange rate is not an absolute constraint, it can worsen the incentives facing discretionary monetary authorities to seek short-run benefits at the expense of greater longer run costs. Thus, rather than serving to offset domestic time inconsistency problems discretionary pegs can exaggerate them. This presents a strong case for turning discretionary exchange rate policy over to an independent central bank.

There is even a case where fixed exchange rate with high capital mobility can undercut the ability of an independent central bank to counteract efforts by governments to generate political business cycles (see section 3). Thus we can see that there is no simple general relationship between central bank independence and internal sources of discipline.

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[7] A recent paper by Bodea (2006) considers the case of imperfect credibility of both central bank independence and fixed exchange rates and analyzes the incentives of left versus right wing governments to adopt them under different circumstances. She also shows that even imperfectly credible commitment strategies can be welfare enhancing.

[21] With moderate capital mobility, an independent central bank could sterilize the capital inflow, at least in the short run, and avoid monetary expansion or indeed could even contract the money supply to penalize the fiscal authorities for bad behavior. With very high capital mobility, however, sterilization is not possible and discipline would not be exerted.

3. Fixed Rates, Capital Mobility, Macroeconomic Discipline, and Political Business Cycles

In this section we begin by exploring the implications of the Mundell-Fleming model for the discipline effects of fixed exchange rates and high international capital mobility over national monetary and fiscal policies. We will show that it is quite important to distinguish both between effects on monetary and fiscal policy, and between constraint and incentive effects.

While the Mundell-Fleming model has been fancied up in a number of useful ways over the years and is inappropriate for dealing with some important issues (such as stock-flow relationships, farsighted inter-temporal optimization, and speculative expectations) it remains the workhorse of international monetary analysis.[19] It stresses how the choice of exchange rate regimes and the degree of international capital mobility interact to influence the effectiveness of domestic monetary and fiscal policy. Despite the many qualifications added by theoretical improvements in the model, some of the most important conclusions of the original model remain in tact. Under fixed exchange rates high capital mobility reduces the effects of monetary policy on domestic demand, while under flexible rates the strength of monetary policy is increased. Thus we should not make broad generalizations such as increases in globalization always undercuts national autonomy.

Likewise while high capital mobility increases the strength of fiscal policy under fixed rates, it reduces it under flexible rates (because capital inflows cause currency appreciation and reduce the trade balance). Indeed by providing lower cost financing, high capital mobility under fixed exchange rates can reduce short run discipline over fiscal policy (see Andrews and Willett [1997] and Willett [2000a]). Thus, as Clark et al. (1998) note, the stark implication of the Mundell Fleming model is that governments cannot be kept by international market forces from generating

political business cycles. Under fixed exchange rates they could use fiscal policy and under flexible rates they could use monetary policy.

One of the oversimplifications of the Mundell-Fleming analysis is that monetary and fiscal policy can be treated as completely independent policy instruments. Thus Clark et al. express skepticism that with an independent central bank, governments could run an effective political business cycle policy under fixed rates with fiscal policy alone. In a closed economy with a steep LM curve, they are exactly right. However, with perfect (or very high) capital mobility under fixed rates, the central bank cannot run an independent monetary policy. Any attempt to set interest rates above or below world levels would lead to massive capital flows which would in turn force domestic interest rates back to world levels. Thus the monetary authorities lose the ability to conduct monetary policy. However, expansionary fiscal policy (a shift out of the IS curve) would induce its own financing through capital inflows and consequent expansion of the domestic money supply. Thus while with high capital mobility and fixed rates the monetary authorities cannot influence the money supply even in the short run, the fiscal authorities could. This would nullify the ability of an independent central bank to keep politicians from generating a political business cycle.[21]

When forward looking expectations and price adjustments are added to the model, then concern about inflation and excessive levels of government debt could lead to immediate private sector sanctioning of the deficit through increased inflation and risk premia in interest rates. How well markets actually do this is a matter of considerable importance about which there is considerable disagreement. The available evidence strongly suggests that the real world lies somewhere between the short sighted Keynesian version of the original Mundell-Fleming analysis and the farsighted new classical rational expectations models currently popular among academic

economists.[22] We get important insights from both types of analysis and neither is an adequate depiction of reality for all purposes. Obviously, the comparative explanatory power of these approaches is a crucial research issue.

With less than perfect capital mobility an important distinction must be made between short run and long run independence. With hard fixes, the loss of long run monetary independence is generated by the requirement of long term balance of payments equilibrium, i.e., the condition that one cannot indefinitely expand or contract your international reserves.

Note that if a country's currency is held by others as international reserves without convertibility into some more basic reserve asset then a fixed exchange rate by itself is not a constraint. In other words the exchange rate peg between the Austrian schilling and the German mark provided discipline for Austria, but not Germany. Thus, it is important to specify the monetary arrangements that accompany an exchange rate regime. The perverse effect of exchange rate incentive structures turned out to be only a minor problem for the European Monetary System in terms of generating inflation, largely became of the strong anchor of the Bundesbank. However, for a number of developing and emerging market economies, these perverse incentives have had major effects. They help explain the hyperinflation that accompanied the dissolution of the Soviet Union.

Countries that maintained a pegged rate against the Russian ruble after the breakup of the Soviet Union were constrained in the rate of inflation they could run, but this constraint was for a while in a quadruple digit range. Indeed in an early stage the fixed rates of the FSU's ruble zone were an incredible engine of inflation. The mutual acceptability of each other's ruble emersions

[22] See the analysis and references in Willett (2000). While the new classical rational expectations models are much more elegant, the older Mundell-Fleming analysis is much better for illustrating the important difference between substantial and perfect capital mobility.
[24] See the analysis and references in Willett, Keil, and Ahn (2002).

with no centralized control generated strong incentives for excessive money creation which were duly taken advantage of with disastrous results (see Banaian and Zhukov, 1995).

Now let us return to the case of a smaller country with its exchange rate fixed to a larger stable partner. Unless capital mobility is extremely high, the small country will still have some short run monetary policy independence. The amount of this independence will be greater, the lower is the degree of capital mobility and the less is its openness to international trade. Even with the tremendous increase in international capital mobility in recent years many countries, including middle-sized emerging markets like Korea and Thailand, have considerable scope for short run sterilization and independent monetary expansion.[24]

In such cases short run monetary discipline comes from incentives, not binding constraints. It is on the knowledge that the long-term constraint must be met that discipline over short run behavior must rely and this may not always be sufficient. A genuinely fixed exchange rate wields its shadow of the future in the form of a high probability that any current rapid monetary expansion will have to be reversed later in order to restore long run balance of payments equilibrium. This will increase the likely future costs of a current expansion. How powerfully this would discourage pre-election expansion would depend on the expected future costs relative to current benefits, the time rate of discount of the relevant decision makers, and the probability that the future costs will actually have to be borne. The latter is lowered by the possibility that the decision makers will no longer be in power when the bill comes due (and hence will likely face a smaller share of the costs). This probability is also lower; the greater is the degree of noise (in the environment if there is a good deal of uncertainty about future balance of payments developments then policy makers will see a greater subjective probability that give rise to that expansionary policy might not have to be reversed after all in the future).

Depending on the balance of these factors, the long-term constraint may or may not provide enough incentives for short-term discipline and the avoidance of political business cycle behavior. Thus even under a genuinely fixed exchange rate, it may not be redundant to make the central bank institutionally independent of political pressures in order to reduce the likelihood of unstable short run behavior. As has been stressed in the literature on monetary constitutions, for a constraint system to work well, the costs of actually hitting the constraint need to caste their shadow over decisions made within the constraint, otherwise dynamic instability is likely to result.[25] In this context, it is likely that a central bank that was highly sensitive to short term political pressures would tend to give insufficient weight to the shadow of the constraint.

Central bank independence would be redundant where an automatic rule to not sterilize international reserve flows is followed. Under these so-called "rules of the game" of the gold standard or of currency boards, non-sterilization would put domestic monetary policy on automatic pilot. In fact, however, these "rules" were seldom followed in the short run. The gold standard was in practice more managed than automatic, but the greater wage and price flexibility and lower degree of perceived government responsibility for providing full employment typically gave rise to less political pressure for short run manipulation of monetary policy than has occurred in the post war period.[26] Probably the closest to fully automatic monetary systems have been the stronger forms of currency boards adopted by a number of smaller countries.[27] Of course, as discussed above, sufficiently high capital mobility would likewise make sterilization impossible under any

[25] See the analysis and references in Willett (1987).
[26] See Eichengreen (1998). Of course, the William Jennings Byran cross of presidential gold campaign reminds us that monetary policy was not entirely apolitical even during the gold standard.
[27] It should be noted, however, that there is a good deal of variation among the actual institutional arrangements among countries labeled as having currency boards. Then for example, there is greater scope for an automatic monetary policy in Hong Kong than in Estonia. See, for example, Dubauskas et al. (1999).

type of fixed exchange rate regime, but few, if any, countries have faced such a high degree of capital mobility.[28]

As one moves from a permanently fixed to an adjustably pegged exchange rate regime, the balance of incentives tips further away from short term discipline. Indeed, it seems likely that adjustably pegged exchange rate regimes maximize the incentives for political business cycle behavior.[29] Granted there will still be costs to devaluation. Except for very small open economies, however, these costs are likely to be less than for the domestic deflation required under genuinely fixed rates. Thus the expected future costs of current expansionary policies are reduced. It is not surprising that many developing countries have displayed election related patterns in their balance of payments and exchange rate policies. Mexico is a prime example.

It is relatively straightforward that a pegged exchange rate will yield less discipline and greater incentives for political business cycle behavior than permanently fixed rates. But pegged rate regimes may also provide less discipline than flexible rate systems. Neither provides a long run constraint, thus the question comes down to their comparative effects on incentives.[30] While the economic effects would be largely the same, the political costs of a devaluation under pegged rates is likely to be considerably higher than for a similar sized depreciation under flexible exchange rates. This cuts in favor of greater discipline under pegged rates. Against this must be balanced any possible differences in short term benefits under the two types of regimes and any differences in early warning signals that may be given to forward looking agents.

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[28] The concept of financial capital mobility relevant in this context is the quantity of capital that flows into or out of a country per unit change in expected return (the interest rate plus any expected change in the exchange rate).

[29] See Willett and Mullen (1982) and Rogoff (1985).

[30] Our analysis has focused on disciplining opportunistic government behavior. It may hold more promise for well meaning but politically weak governments who are seeking to rally political support for their policies. This will only be successful, however, if the government follows an active strategy of using the need to defend the currency to build an effective domestic coalition in support of the necessary monetary and fiscal discipline. The competence of the government in pursuing such coalition building, the salience of exchange rate defense, and the size of the swing group in the legislature that can be potentially influenced will all vary from case to case.

4. Effects of Exchange Rate Regimes and Trade Openness on Short-Term Inflation-Unemployment Trade Offs

The traditional political business cycle models and analysis of time inconsistency problems more generally is driven by the differential price and quantity effects from unanticipated macro economic expansions. In the typical economy characterized by a considerable degree of short run wage and price stickiness, quantities tend to respond more quickly than prices. This gives rise to a non-vertical Phillips curve in the short run. Its slope will be flatter, the greater is the degree of wage and price stickiness and the less expected are changes in policy.

The incentives to play the traditional PBC game are a direct function of the slope of the short run curve. The flatter the curve, the greater are the initial quantity relative to price effects, and hence the greater is the incentive to play the game. With a perfectly vertical short run curve (as in the strongest forms of the new classical rational expectations models) this incentive disappears entirely.

A. Flexible Rates Steepen the Short-Run Trade-Off Facing Unanticipated Monetary Expansion

From this perspective, flexible rates will reduce the short term benefits from a monetary expansion induced political business cycle by leading to immediate depreciation. This will speed up the price effects and make the short run Phillips curve steeper. This effect will typically be greater, the higher is the degree of international capital mobility since this will increase the amount of short run depreciation from a given amount of monetary expansion. Thus unless capital mobility is high enough to prevent the expansion of the domestic money supply under pegged rates,

flexible rates would score better on this aspect of discipline. By the same token, a government wanting to play the PBC game would prefer pegged rates.[31]

When we turn to fiscally induced expansion, this strong advantage of flexible rates no longer holds. Fiscal expansion would induce capital inflows which would limit the depreciation or, where capital mobility were sufficiently high, would lead to appreciation. Thus neither pegged nor flexible exchange rates are likely to provide effective discipline against opportunistic fiscal expansion as long as a country still has considerable borrowing capacity.[32] Increases in international capital mobility could thus act to reduce rather than increase short-term discipline. It can be argued that the Italian experience during the EMS and Argentina during its currency board show that this possibility is not just hypothetical.[33]

B. Trade Openness and Inflation

This analysis suggests an important qualification to Romer (1993)' s argument that greater openness will reduce the incentives for surprise monetary expansions. Romer's analysis in effect assumes flexible exchange rates. As we discussed, with flexible rates depreciation would speed up the price effects of a monetary expansion and this effect would be greater, the more open is the economy. Thus openness would decrease the incentives for monetary expansion. However, with pegged exchange rates, we would expect the opposite to occur. The more open the economy, the greater the proportion of an increase in aggregate demand that would be spent on imports rather than domestic goods. Since any one country is only a fraction of the world economy, it would face a flatter supply curve for imports than for domestic goods and as a consequence would have a

[31] This would hold whether monetary or fiscal policy were used.
[32] At very high levels of debt to GDP ratio, budget deficits are much more difficult to finance.
[33] See Andrews and Willett (1997). This paper also suggests that this may help explain Garrett's [1998] [1995] failure to find that capital mobility has severely constrained the welfare state as many had posited.

flatter short run Phillips curve, the more open the economy. Thus just as the Mundell-Flemming model shows that the effects of the degree of capital mobility on the strength of domestic monetary and fiscal policy will depend crucially on the nature of the exchange-rate regime in operation, so also the effects of trade openness on the incentives for monetary expansion depend on the exchange-rate regime.

One aspect of Romer's argument that greater openness reduce equilibrium inflation relies on a terms of trade effect. Where domestic and foreign goods are not perfect substitutes then output expansion in the home country will reduce its relative price and hence reduces the incentives for excessive expansion and inflation. Lane (1997) extends Romer's model and shows that his conclusion holds even for small countries where there is no terms of trade effect. Lane focuses initially on the role of short-run rigidities in the domestic sector.

Romer's second argument is that "openness affects the output-inflation tradeoff. Specifically, increased openness raises the amount of inflation associated with a given expansion of output…the reason is the real depreciation associated with the expansion of domestic output" (p.873). This conclusion clearly holds under flexible exchange rate for a wide range of theories of the inflation-output or unemployment tradeoffs.

But Romer argues that this relationship will hold under any exchange rate regime,[34] while our earlier analysis suggested that under a pegged rate the short-run Phillips curve facing an unanticipated monetary expansion would be flatter under pegged rates, thus increasing the incentives for surprise inflation and raising the equilibrium inflation rate in a Barro-Gordon type model. Romer bases his argument on the existence of real depreciation following a monetary expansion. Clearly if domestic price and wage adjustments are sluggish, then real depreciation

[34] "There is no priori reason to expect the predictions of the theory to apply only to certain types of countries. In particular, the theory should apply to countries with fixed as well as flexible exchange rates" (Romer, 1993, p.874).

would be more rapid under flexible than fixed rates. But more than this, in the short-run higher domestic inflation under a fixed exchange rate leads to real appreciation, not depreciation.

One of the problems in Romer's analysis is that he relies on the popular Barro-Gordon model of surprise inflation. In this model, the amount of output increase is a positive function of the amount of surprise inflation. In the traditional analysis of a shift in aggregate demand along an aggregate supply curve, there is also a positive relationship between surprise inflation and an increase in output. In this view, however, the relationship comes not from the surprise inflation itself but from a shift in aggregate demand along a short-run aggregate supply or Phillips curve. Since here the effects are determined by the slope of the aggregate supply curve, for a given change in aggregate demand, the less is the increase in inflation, the more will be the increase in output. Thus, with a move to flexible rates that steepens the short-run aggregate supply curve with respect to unanticipated demand shocks, a greater amount of surprise inflation is associated with a smaller rather than larger increase in output.

The difference between the short-run slopes under fixed and floating rates would in turn be a positive function of the level of openness. In our analysis, we retain Romer's conclusion for the effects of openness under flexible rates, but present a counterargument for the effects of openness under fixed rates. Under hard fixes, results could go either way since the short-run incentives would be more for surprise monetary expansion, but the longer run fixed rate constraint would raise the future cost of such expansions because they would require future contractions. Obviously, which way the net effects went would be a function in part of the authorities' discount rate.

We can unambiguously conclude, however, that whatever the direction of the net effects, for a given discount rate, adjustable pegs would be associated with higher inflation than under a hard fix since the authorities have the additional future option of devaluating peg. If devaluation

were judged to costly to contemplate under an adjustable peg than it would in effect be a hard peg. If not, then the expected future cost of a current surprise expansion would be lowered.

Yuen (2002) presents an expectations augmented Mundell-Fleming model in which the differences in slope of the short-run Phillips curve under pegged versus flexible exchange rates in a function of the elasticities of aggregate demand with respect to the real interest rate and real exchange rate. In his model, flexible rates could be associated with steeper or flatter Phillips curves but he suggests that the elasticity parameters make a steeper curve more likely.

We cannot unambiguously rank adjustable pegs versus flexible rates over all discount rates, but it is clear that the higher the discount rates, the higher would be the average rate of inflation under an adjustable peg as compared with a float. This suggests that an adjustable peg is likely to be a quite inefficient way of attempting to overcome domestic time inconsistency problems.

5. Empirical Evidence on Exchange Rate Regimes and Inflation

Strictly speaking an anticipated change in prices would cause a shift in the short run Phillips curve but the effect would be the same as if the curve were steeper. Hence, the new classical argument that a credible commitment to monetary tightening could reduce inflation without need for a recession. In practice, however, it has proven extremely difficult to make such commitments immediately fully credible even with the use of strong institutional mechanisms such as the adoption of currency boards.

Romer presents evidence that trade openness is positively correlated with lower inflation for non-industrial countries. He argues that the lower inflation for industrial countries is due to their having found other ways to overcome time inconsistency problems. While this latter comment contains considerable truth, it overlooks that many studies have found a positive correlation

between measures of central bank independence and inflation among the industrial countries suggesting that there had been significant variations in the degree to which time inconsistency problems had been overcome.[35]

Alfaro (2005) includes both openness and exchange rate regimes in her analysis and finds that pegged rates significantly lower inflation while openness does not. However, her study does not speak directly to our distinction between hard and soft fixes since she uses the Reinhart and Rogoff's classification that lumps together soft fixes that survive for some time with hard fixes and does not have a separate category of adjustable pegs.[36] When we make use of the new IMF judgmental classifications that do make this distinction, we find that there is a quite substantial difference for both rates of money growth and inflation between hard fixes and adjustable pegged regimes. We use annual data from 1990 – 2003, covering 27 emerging-market and 36 developing countries. The start and the end year were chosen based on the availability of the classification of exchange rate regimes by Bubula and Ötker-Robe (2002).

The empirical approached used is Arellano and Bond's Generalized Methods of Moments (GMM). This method helps deal with the endogeneity or "reverse causality" issue where there is a possibility that the choice of exchange rate regimes is dependent on a country's fiscal and monetary policies. GMM also more effectively deals with panel data where the presence of the country's fixed effects must be controlled for, as well as the inertia behavior of the dependent variable.[37] Furthermore, Romer's conclusion of a general negative relationship between openness and inflation

[35] See for example, Burdekin et al ( ) Cukierman ( ) and …

[36] Ghosh et al. (2002) focus mainly on pegs, intermediate, and float; they however also test the six-way classification: hard pegs, single curreny pegs, basket pegs, rule-based flexible, floats with discretionary intervantion, and pure floats. In addition to Ghosh et al.'s three-way classification, Husian, Mody, and Rogoff (2004) also use Reinhart and Rogoff's classification, which as previously mentioned does not distinguish between hard and soft pegs.

[37] Studying fiscal performance of different exchange rate regimes, Vuletin (2003) found that GMM is superior to other econometric methods including Fixed Effects and Generalized Least Squares.

in non-industrial countries has been challenged. As argued above, we believe that Romer's argument applies only to explain with short run exchange rate flexibility.

We add standard control variables, including openness, terms of trade, real GDP growth, change in US T-bill rate, fiscal balance, and crisis indices. We use a six-way classification of exchange rate regimes: hard pegs, adjustable pegs, forward-looking crawling pegs and bands, backward-looking crawling pegs and bands, managed floats, and floats. In this paper, we only report the results for hard pegs, adjustable pegs, managed floats and floats since these are the regimes that are most relevant for the current discussion.

Bubula and Ötker-Robe's most flexible category – independent floats – are associated with high average levels of money growth and inflation. Countries with high inflation usually of necessity adopt some form of floating rates. Reinhart and Rogoff (2002) deal with this issue by putting such countries into a separate category of free falling rates. Of course when this is done the remaining category of non-free falling floating rates is associated with much better macroeconomic performance. One could argue that this is just a biased way of making floating look better. There is no ideal way to deal with this reverse causation issue. Here we deal with the issue by comparing hard and soft fixes with managed floats which removes most of the very high inflation countries.[39] Floating regimes are used as a default regime, hence the coefficient of exchange rate regimes is read as the difference in performance between the particular regime and floating regimes. We find that while hard fixes are associated with the lowest rates of inflation and money growth, managed floats are associated with better performances than adjustable pegs on both these scores. As shown in Tables 1-2, these differences hold up across both developing and emerging market countries, with the only exception that there was little difference between the two regimes for inflation rates

[39] Most managed floats are less likely to subject to this particular type of endogeneity than are floating rates.

in emerging market countries. In emerging market economies, the adjustable pegs are found to be associated with approximately 2 percent higher inflation than the managed floats, while the difference is approximately 4 percent in developing countries. The difference is greater when money growth is examined: 0.2 percent for the emerging-market group versus 9 percent in the developing country sample.[40]

The differences between hard and soft fixes are driven primarily by developing countries. Since there was only one case of a hard fix for the emerging market countries, Argentina during 1991-2001, it is dropped automatically to avoid the collinearity problem. Exchange rate regime coefficients for developing country sample are generally larger than those of the emerging-market economy group, this is because in the developing country group inflation and money growth are significantly greater with the floating regime than the other exchange rate regimes.

We find little systematic evidence of pegged rates promoting fiscal discipline (tables 3 and 4).[41] We cyclically adjust fiscal balances, thus removing the endogenous effects of the business cycle and giving us a better measurement of policy.[42] For the whole sample, hard fixes are associated with slightly smaller deficits than adjustable pegs, which in turn record somewhat better performance than managed floats, but the differences are far from being statistically significant. For developing countries, however, adjustable pegs and managed floats were both associated with larger deficits than hard fixes. The numbers show that adjustable pegs are associated with

[40] We have also undertaken a number of sensitivity tests. While there is some variability in the estimates the general pattern of the coefficients of the exchange rate regimes was robust. Trade openness was usually, but not always, positive, and often highly significant. However, in the inflation regression when openness at time *t* was replaced with openness at *t*-1, the coefficient sometimes became large and negative. This obviously requires further investigation.

[41] This is consistent with other recent studies. While Tornell and Velasco (1998, 2000) find that fixed exchange rate regimes are associated with larger fiscal deficits, Heinemann (1999) finds no evidence as such. He concludes that there is no evidence that exchange rate regime is relevant for fiscal balance. Edwards (2003) specifically examines dollarization countries and also finds that dollarized countries have not run more prudent fiscal policies than non-dollarized countries.

[42] From this perspective, it would be best to look at cyclically-adjusted primary deficits; data limitations prevented us from doing so for this study.

approximately 4 percent higher deficits than the hard fixes, while the managed floats are associated with approximately 2 percent greater deficits.[43]

6. Some Additional Considerations

It is often emphasized in the literature that an institution will be more credible, the greater is the cost of abandoning it. Thus, since the political and economic cost of devaluing a hard fix should be much higher than devaluing an adjustable peg, the credibility of the former should be much greater. What is sometimes overlooked, however, is that the relevant consideration is not just the cost of abandonment, but this cost relative to the cost of maintaining the policy or institution.

A. Constraint Versus Optimal Rule Approaches

Credibility effects of alternative commitment mechanisms are frequently discussed without regard to the structure of economies and the patterns of shocks that they face. This should not be the case, however. Policy regimes are more likely to be maintained the greater the benefits or the lower the costs that they generate. Just as optimum currency area (OCA) theory has shown us the limitations of debating fixed versus flexible rates in the abstract, so is a debate about rules versus discretion in general likely to be oversimplified.

[43] For more complete empirical results on discipline, see Dechsakulthorn (2007). We would have like to also look at the effects of central bank independence and inflation targeting but it has been found that institutional measures of central bank independence have little meaning in many developing countries and few developing countries have adopted inflation targeting until recently.
[53] See Willett (1987) and (1988).

As long as there are problems with discretion such as time inconsistencies, then there is the potential for rules to be better – but there may be no good simple rules. Most of the arguments for particular types of monetary rules focus on the types of shocks and/or structure of the economies where these rules would be close to optimal. But we know from modern monetary analysis that optimal rules (or discretionary policy regimes) can vary greatly in the face of different types of shocks. For example, under conditions of international currency substitution Ron McKinnon's (cite?) argument that fixed exchange rates with no sterilization are optimal is correct, but with a temporary shift of portfolio capital a fixed rate with sterilization would be optimal; also, with a shock to the equilibrium real exchange rate, maintaining a fixed exchange rate would be sub-optimal unless the domestic economy is highly flexible.

Given the wide variety of shocks that can hit economies, such analysis suggests that narrow rules of any kind are unlikely to provide optimal systems of constraints. Rather, broader limitations on bad outcomes should be established with discretion given to authorities to stay within these constraints.[53] The constraints themselves would frequently not provide satisfactory operating rules, but the costs of breaching the constraints would give authorities incentives to take the constraints into account before they are hit. As with many of the discipline effects discussed earlier, the smooth operation of this approach requires that attention be given to the shadow of the future, but such systems should be able to be designed in ways that place less reliance on authorities having low discount rates.

From this perspective, flexible inflation targeting with an independent central bank has great attraction. On the other hand, exchange rate-based approaches seem optimal only in the limited range of cases where OCA criteria suggest that a hard fix is close to optimal.

B. The Relevance of OCA Considerations

While there is considerable controversy about many aspects of OCA analysis, a widely accepted conclusion is that the cost-benefit ratio of fixed versus flexible exchange rates is much higher for large relatively closed economies than for small open ones. Thus, ceteris paribus, an exchange rate targeting strategy becomes more attractive relative to an inflation targeting strategy, the smaller and more open is the economy.

The large number of important OCA criteria suggests that for relatively few countries will a hard fix be a sensible strategy. This also implies that there will also be few countries that meet the criteria for free floats with no attention being given in the formulation of monetary policy to the behavior of the foreign exchange market. This suggests that many if not most countries should have intermediate exchange rate regimes, but we know that the traditional form of intermediate regime, the adjustable peg, is highly crisis prone in a world of substantial capital mobility.[54] Willett (2003) has suggested, however, that we can think of intermediate regimes in a different way – not in terms of the mechanisms of the exchange rate regime, but in terms of the weight given to the exchange rate in setting domestic monetary policy. This approach would set limits on the amount of sterilized exchange rate intervention allowed, but not on the amount of unsterilized intervention. Except for very open economics this approach should be consistent with flexible inflation targeting.

C. Transparency Issues

Considerable attention has been paid recently by scholars to the issue of transparency as a criteria for evaluating the comparative advantages of using exchange rates versus central bank independence (CBI) as a source of discipline (Broz 2002, Bodea 2006). A major point of emphasis

[54] For empirical evidence, see the analysis and references in Angkinand, Chiu, Willett (2006).
[57] See Willett (2007).

is that deviations from exchange rate commitments are typically more easily seen than is excessive monetary accommodation, thus giving a plus to exchange rate commitments over CBI.

The comparison becomes less clear cut, however, when CBI is combined with inflation targeting as it now frequently is. A defection from maintaining a fixed exchange rate will still typically be more visible and attract more public attention that deviations from an inflation target. But this should not be the only consideration. In such cases we are talking not about constraints but how the prospect of the cost of possible future defections would affect the current incentives facing policymakers. And thus in turn depends on the attention given now to potential future costs. Thus the problem of political pressures on policymakers to adopt short-time horizon and/or indulge in excessively optimist views of the future becomes important.

In this context how the different regimes operate in terms of generating early warning signals becomes important. On this score, neither CBI-inflation targeting nor exchange rate commitments score well. Much of the public is unlikely to follow closely the short-run behavior of monetary policy. But by the same token few will likely follow losses of foreign reserves and other indicators of emerging balance of payments developments. And with respect to those experts who do follow the signals carefully, it is likely easier to hide official interaction in the foreign exchange market than the elements of domestic monetary policy. For example, almost no countries make public their forward sales and purchases in the foreign exchange market and both Korea and Thailand used sizable amounts of such sales to hide their reserve losses prior to the Asian crises. Thus with both domestic monetary and exchange market policy there can be substantial lags before consequences show up in high inflation or currency crises.

High international capital mobility may likewise serve to initially dampen the most visible initial signals of high budget deficits, i.e. increases in interest rates. This could hold under both

fixed and flexible exchange rates. Turning to monetary policy transparency considerations, with respect to early warning signals flexible exchange rates would likely give the most visible early signals of rapid monetary expansion. Since domestic monetary policy isn't the only factor influencing the exchange rate, this signal would not be without noise. But on these grounds we are inclined to agree with the arguments of Gottfried Haberler that flexible rates were likely to give more discipline than fixed rates, since depreciation would give a much clearer signal than reserve losses. [Give some elaboration?]

7. Concluding Remarks

Our analysis suggests limits on the extent to which pegging strategies are likely to be useful as sources of discipline. We highlight the problems of attempting to use commitment devices with asymmetric time profiles to overcome problems generated by the asymmetric short run effects of discretionary monetary and fiscal policies. Where short time horizons greatly discount future costs of an exchange rate crisis, the political incentives generated often fail to provide sufficient monetary and fiscal restraint to successfully defend the peg over the long term. They also tend to discourage the prompt adjustment of disequilibrium exchange rates. As a consequence, exit from a pegged regime is often delayed too long and currency crises result. Thus the political incentive structures generated by exchange rate pegging seem likely to be as great a source of difficulty for the smooth operation of intermediate exchange rate regimes as are the economic forces of high capital mobility stressed by many economists.[57]

The disciplining effects of high capital mobility are also found to be wanting. Seldom do capital flows operate as actual constraints over policy. Rather they need to be seen as primarily affecting the costs and benefits of various policy actions and hence influencing incentive structures.

In some cases, high capital mobility can reduce fiscal discipline and in many cases a lack of farsightedness in the financial markets have failed to give early warning signals of policies going off track. Likewise we find that Romer's argument about the effects of trade openness in reducing time inconsistency problems does not apply to soft pegs.

While discipline effects of alternative monetary regimes are frequently discussed independently of the structural characteristics of economics, we argue that optimal currency area considerations should be at the heart of such analyses. Only for economies that are reasonable candidates for hard fixed on OCA criteria should the primary focus be on external sources of discipline. For the substantial majority of other countries, flexible inflation targeting implemented by independent central banks is likely to prove superior. Open economy considerations may have important effects on the best methods of implementing flexible inflation targeting. This is an area which deserves a great deal more research.[58]

[58] For discussion of some of these issues, see Willett 2003.

References

(not yet complete)

Alfaro, Laura. 2005. "Inflation, Openness, and Exchange Rate Regimes: The Quest for Short-Term Commitment," *Journal of Development Economics*, 77(1): 229-49.

Al-Marhubi, Fahim, and Thomas D. Willett. 1994. "Currency Policies for Inflation Control in the Formerly Centrally Planned Economies." *The World Economy*, November: 795-815.

Alesina, Alberto, Gerald D. Cohen, and Nouriel Roubini. 1991. "Macroeconomic policy and elections in OECD democracies." NBER Working Paper No. 3830. Cambridge, Mass.: National Bureau of Economic Research, September.

Andrews, David, and Thomas D. Willett. 1997. "Financial Interdependence and the State: International Monetary Relations at Century's End." *International Organization* 51(Summer): 479-511.

Angkinand, Apanard, Eric Chiu, and Thomas D. Willett. 2005. "Testing the Unstable Middle and Two Corners Hypotheses." Presented at the Annual Meetings of the International Studies Association and Western Economic Association.

Bates, Robert H., Avner Greif, Margaret Levi, Jean-Laurent Rosenthal, and Barry R. Weingast. 1998. *Analytic Narratives*. Princeton: Princeton University Press.

Banaian, King, and Eugenue Zhukov. 1995. "The Collapse of the Ruble Zone," in Thomas D. Willett et al., eds., *Establishing Monetary Stability in Emerging Market Economies*. pp. 209-30. Boulder, Colorado: Westview Press.

Banaian, King, Richard C. K. Burdekin, and Thomas D. Willett. 1995. "On the Political Economy of Central Bank Independence," in Kevin D. Hoover and Steven Sheffrin, eds.,

Monetarism and Methodology in Economics: Essays in Honor of Thomas Mayer. pp. 178-197. Aldershot, U.K.: Edward Elgar.

_____. 1998. "Reconsidering the Principal Components of Central Bank Independence," *Public Choice*, 97 (1), pp 1-12.

Barro, Robert J., and David B. Gordon. 1983a. "A Positive Theory of Monetary Policy in a Natural Rate Model." *Journal of Political Economy*, August: 589-610.

_____. 1983b. "Rules, Discretion and Reputation in a Model of Monetary Policy." *Journal of Monetary Economics*, July: 101-21.

Bayoumi, Tamim, and Barry Eichengreen. 1998. "Exchange Rate Volatility and Intervention: Implications of the Theory of Optimum Currency Area." *Journal of International Economics* 45(2): 191-209.

Bird, Graham. 1996. "The International Monetary Fund and Developing Countries: A Review of the Evidence and Policy Options. *International Organization* (summer): 477-511.

Bird, Graham, and Thomas D. Willett. 2004. "IMF Conditionality, Implementation and the New Political Economy of Ownership." *Comparative Economic Studies*, 46(3): 423 – 450.

Bodea, Christna. 2006. "Exchange Rate Regimes and Independent Central Banks: A Correlated Choice of Imperfect Credible Institutions." Paper presented at IPES Conference, Princeton University, November 17-18.

Broz, Lawrence J. 2000. "Political Institutions and the Choice of Monetary Policy Commitment Regimes." Paper prepared for delivery at the 2000 Annual Meeting of the American Political Science Association. August 31-September 3, 2000, Washington D.C.

Burdekin, Richard C. K., Arthur T. Denzau, Manfred W. Keil, Thitithep Sitthiyot, and Thomas D. Willett. 2004. "When Does Inflation Hurt Economic Growth? Different Nonlinearities for Different Economies," *Journal of Macroeconomics* 26 (3), pp. 519-532.

Chiu, Eric, and Thomas D. Willett. 2006. "The Interactions of Government Strength and Alternative Exchange Rate Regimes in Avoiding Currency Crises." Presented at International Political Economy Society Conference, Princeton University, November 17-18.

Clark, William Roberts. 1999. "Competing and Complementary Explanations of Monetary Regime Choice." Paper prepared for presentation at the 1999 Annual Meeting of the American Political Science Association. September 2-5, 1999, Atlanta, Georgia.

Clark, William Roberts, and Usha Nair Reichert. 1998. "International and Domestic Constraints on Political Business Cycles in OECD Economies." *International Organization* 52(1):87-120.

Cooper, Richard (1971?) Princeton Essay

Dechsakulthorn, Sirathorn. 2007. "Discipline Effects and Alternative Exchange Rate Regimes." PhD Dissertation, Claremont Graduate University.

Drazen, Allan. 2000. *Political Economy in Macroeconomics*. Princeton: Princeton University Press.

Dubauskas, Gediminas, Clas Wihlborg, and Thomas D. Willett. "The Baltic States: Alternative Routes to Credibility," in Richard Sweeney, Clas Wihlborg, and Thomas D. Willett, eds., *Exchange Rate Policies for Emerging Markets*. Pp. 83-112. Boulder, CO: Westview Press.

Eichengreen, Barry. .1998. Globalizing Capital: *A History of the International Monetary System*. Princeton: Princeton University Press.

Eichengreen, Barry, Paul Masson, Hugh Bredenkamp, Barry Johnston, Javier Hamann, Estaban Jadresic and Inci Otke. 1998. Exit Strategies: Policy Options for Countries Seeking Greater Exchange Rate Flexibility. IMF Occasional Paper No. 168. Washington, D.C.: International Monetary Fund.

Fischer, Stanley. 2001. "Is the Bipolar View Correct?" Paper prepared for the 2001 American Economic Association meetings. Washington, D.C., International Monetary Fund, January 2001.

Frankel ( )

Frieden, Jeffrey, and Ernesto Stein, eds. 2001. *The Currency Game: Exchange Rate Politics in Latin America*. Washington, D.C.: Inter-American Development Bank.

Geoffrey, Garrett. 1998. *Partisan Politics in the Global Economy*. Cambridge: Cambridge University Press.

_____. 1995. "Trade, Capital Mobility and the Politics of Economic Policy." *International Organization* 49:657-87.

Giavazzi, Francesco, and Marco Pagano. 1988. "The Advantage of Tying One's Hands: EMS Discipline and Central Bank Credibility." *European Economic Review*, June: 1055-82.

Glick, Reuven (2000). "Fixed or Floating: Is It Still Possible to Manage in The Middle?" Paper prepared for the conference on "Financial Markets and Policies in East Asia", Australia National University, August.

Hallerberg, Mark. 2001. "Veto Players, and Monetary Commitment Technologies." Manuscripts. University of Pittsburgh. <available at http://www.pitt.edu/~hallerb/homeframes.html>.

Hallerberg, Mark, and Jurgen Von Hagen. 1997. “Electoral Institutions, Cabinet Negotiations, and Budget Deficits in the European Union. NBER Working Paper No. 6341. Cambridge, Mass.: National Bureau of Economic Research, December.

Hamann, A. Javier. 1999. “Exchange Rate Based Stabilization,” IMF Working Paper 99/132.

Keefer, Philip, and David Stasavage. 2002. “Checks and Balances, Private Information, and the Credibility of Monetary Commitments.” *International Organization* 56(4): 751-74.

Krugman, Paul. 1995. "What Do We Need to Know About the International Monetary System?" in Peter B. Kenen, ed., *Understanding Interdependence: the Macroeconomics of the Open Economy*. Pp. . Princeton: Princeton University Press.

Lane, Philip. 1997. “Inflation in Open Economies.” *Journal of International Economics* 42: 327-47.

Martin, Pamela, Jilleen Westbrook, and Thomas D. Willett. 1999. “Exchange Rates Based Stabilization Policy in Latin America,” in Richard Sweeney, Clas Wihlborg, and Thomas D. Willett, eds., *Exchange Rate Policies for Emerging Markets*. Pp.141-64. Boulder, Colo.: Westview Press.

Milner, Helen. 1997. *Interests, Institutions, and Information: Domestic Politics and International Relations*, Princeton

Mishkin, Fredric, and Adam Rosen. 1997. “Inflation Targeting.” *Economic Policy Review*, Federal Reserve Bank of New York, August 9-10.

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

Rogoff, Kenneth. 1985. “Can International Monetary Policy Cooperation be Counterproductive?” *Journal of International Economics* XVIII: 199-217.

Romer, David. 1993. “Openness and Inflation: Theory and Evidence.” *Quarterly Journal of Economics* CVIII (4): 869-903.

Sachs, Jeffrey. 1997. “An Overview of Stabilization Issues Facing Economies in Transition,” in Wing Woo, Stephan Parker and Jeffrey Sach, eds., *Economies in Transition*. Pp. 243-56. Cambridge, Mass.: MIT Press.

_____. 1996. “Economic Transitions and the Exchange Rate Regime.”, *American Economic Review*, May: 147-52.

Vegh, Carlos. 1992. “Stopping High Inflation,” IMF Staff Papers, Sept. 626-95

Von Hagen, Jurgen. 1998. “Budget Institutions for Aggregate Fiscal Discipline.” ZEI Policy Paper No. B98-01. University of Bonn.

Westbrook, Jilleen. 1999. EMS paper in SWW Exchange Rate Volume

Westbrook, Jilleen, and Thomas D. Willett. 1999. “Exchange Rates as Nominal Anchors: An Overview of the Issues,” in Richard Sweeney, Clas Wihlborg, and Thomas D. Willett, eds., *Exchange Rate Policies for Emerging Markets*. Pp. 83-112. Boulder, CO: Westview Press.

Willett, Thomas D. 2007. “Why the Middle is Unstable: The Political Economy of Exchange Rate Regimes and Currency Crises.” *The World Economy* (forthcoming).

_____. 2003. “Fear of Floating Need Not Imply Fixed Exchange Rates,” presented at the Fordham CEPR Conference on Dollarization and Euroization, *Open Economies Review,* (1): 71-91.

_____. 2000. “International Financial Markets as Sources of Crisis or Discipline.” *Princeton Essays in International Finance*, No.218. Princeton: Princeton University Press, May.

_____. 1999. "A Political Economy Analysis of the Masstricht and Stability Pact Fiscal Criteria," in Andrew Hughes Hallett, Michael Hutchison, and Svend Jensen, eds., *Fiscal Aspects of European Monetary Integration*. Pp. 37-66. Cambridge: Cambridge University Press.

_____. 1998. "Credibility and Discipline Effects of Exchange Rates as Nominal Anchors: The Need to Distinguish Temporary from Permanent Pegs." *The World Economy* 21 (August): 803-26.

_____., ed.1988. *Political Business Cycles: The Political Economy of Money, Inflation, and Unemployment*. Durham, N.C.: Duke University Press for the Pacific Research Institute.

_____. 1987. "A New Monetary Constitution? An Evaluation of the Need and Major Alternatives," in James Dorn and Anna Schwartz, eds., *The Search for Stable Money*. Pp. 145-60. Chicago: University of Chicago Press.

Willett, Thomas D., and King Banaian. 1996. "Currency Substitution and Seniorage Considerations in the Choice of Currency Policies," in Paul Mizen and Eric Pentecost, eds., The Macroeconomics of International Currencies, Brookfield, VT: Edward Elgar.

_____.1988. "Model of Political Process and Their Implications for Stagflation: A Public Choice Perspective," in Thomas D. Willett, ed., *Political Business Cycle*. Pp. . Durham, N.C.: Duke University Press for the Pacific Research Institute.

Willett, Thomas D. and Manfred W. Keil. 2004. "Political Business Cycles," in Charles Rowley and Fredrich Scheider, eds., *Encyclopedia of Public Choice* Vol. 2. pp. 411-415. New York, N.Y.: Springer-Verlag.

Willett, Thomas D., Manfred W. Keil., and Yong Seok Ahn. 2002. "Capital Mobility for Developing Countries May Not Be So High." *Journal of Development Economics*, 68: pp. 421-434.

Willett, Thomas D., and John Mullen. 1982. “The Effects of Alternative International Monetary Systems on Inflationary Biases and Macroeconomic Discipline,” in Raymond E. Lombra and Willard E. Witte, eds., *Political Economy of International and Domestic Monetary Relations*. pp. 143-55. Ames, Iowa: Iowa State University Press.

Williamson, John. 1996. *The Crawling Band as an Exchange Rate Regime*. Washington, D.C.: Institute for International Economics.

Wise, Carol, and Riordan Roett, eds. 2000. *Exchange Rate Politics in Latin America*. Washington, DC: Brookings.

Yuen, Chi-Wa. 2002. “Openness and the Output-Inflation Tradeoff: Floating vs. Fixed Exchange Rates.” *International Economic Journal*, 16(4): 1-26.

Table 1. Monetary Discipline (M2 Growth Rates)

		All	Emerging Economies	Developing Countries
Hard Pegs	t-1	-13.710 (-0.84)	*(dropped)*	-59.287*** (-3.01)
Adjustable Pegs	t-1	-2.218 (-0.39)	-1.887 (-0.35)	-51.194*** (-2.68)
Managed Floats	t-1	-0.934 (-0.19)	-1.713 (-0.36)	-59.965*** (-3.04)
Constant		-1.694*** (-4.19)	-1.464*** (-3.19)	-0.928× (-1.61)
Sargan Test (p-value)		0.18	0.07	0.36
Second-order serial correlation test (p-value)		0.96	0.18	0.09
No. of observation		402	243	159
No. of countries		43	24	19

*, **, *** indicates the statistical significance level of 10%, 5%, and 1%
× denotes statistical significance level *close to* 10% (10-12%)

Table 2. Inflation Discipline (CPIs)

		All	Emerging Economies	Developing Countries
Hard Pegs	t-1	-38.297*** (-5.32)	*(dropped)*	-58.919*** (-6.24)
Adjustable Pegs	t-1	3.738*** (1.31)	4.562* (1.76)	-36.462*** (-3.97)
Managed Floats	t-1	-0.048 (-0.02)	2.589 (1.12)	-40.678*** (-4.48)
Constant		-1.092*** (-5.03)	-1.061*** (-4.51)	-1.427*** (-4.64)
Sargan Test (p-value)		0.00	0.00	0.83
Second-order serial correlation test (p-value)		0.63	0.39	0.13
No. of observation		402	243	159
No. of countries		43	24	19

*, **, *** indicates the statistical significance level of 10%, 5%, and 1%.

Table 3. Cyclically Adjusted Balance (CAB)

		All	**Emerging Economies**	**Developing Countries**
Hard Pegs	t-1	-1.173 (-0.50)	*(dropped)*	-3.287 (-1.14)
Adjustable Pegs	t-1	-0.447 (-0.64)	0.617 (0.93)	-7.529*** (-2.58)
Managed Floats	t-1	0.330 (0.52)	0.111 (0.18)	-5.147* (-1.74)
Constant (Floats)		0.071 (1.20)	0.103* (1.66)	-0.037 (-0.35)
Sargan Test (p-value)		0.00	0.00	0.07
Second-order serial correlation test (p-value)		0.16	0.74	0.28
No. of observation		370	225	145
No. of countries		43	24	19

*, **, *** indicates the statistical significance level of 10%, 5%, and 1%