

Fixed Exchange Rate Regimes and Financial Markets as Sources of Macroeconomic
Discipline

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Prepared for Thomas Oatley, ed., Handbook of International Monetary Relations

Portions of this paper draw heavily on unpublished conference papers by Willett, Walton, and Walter (2008) and Willett et al (2007). Chiu et al (2012) also draws on other portions of these papers.

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Abstract

This paper analyzes the arguments that fixed exchange rates and financial markets can provide strong discipline over domestic macroeconomic policies. We conclude that such discipline works only under a rather limited set of circumstances. A key aspect of our analysis is the distinction between actual constraints and effects on incentive structures. Fixed exchange rates provide actual constraints only over monetary policy and only for hard fixes like common currencies, not adjustable pegs. With adjustable pegs the long run costs of excessive stimulus are increased, but the short run effects can often be more favorable as inflation is initially reduced due to the failure of traded goods prices to rise. The net effects on incentives would depend strongly on the government's discount rate. A low rate would be needed for positive discipline effects, but it is the high discount rate generated by short time political pressures that generate much of the incentive for inflationary surprises in the first place.

Financial markets influence only incentive structures. Where markets also operate with short time horizons this can help loosen fiscal discipline in the short run by providing easy financing of deficits. Thus the effects on discipline depend heavily on the degree to which financial markets behave according to rational expectations. Arguments from behavioral finance suggest that this will not always be the case. An informal model is presented in which financial markets are too forgiving in the short run, but become more rational after the outbreak of crises serve as a wake up call. On this view financial markets provide strong discipline after crises break out, but not before. A number of episodes are examined that seem to fit with this story.

1. Introduction

It is often argued that financial markets are a major source of much needed discipline that can counter the political forces that often generate excessive fiscal deficits and money and credit expansion. For example, Robert Altman, former Deputy Secretary of the US Treasury, argues that "capital markets are the most powerful force on earth, repeatedly forcing outcomes which political processes can't." Likewise there is frequent advocacy of the adoption of fixed exchange rates, sometimes even including a return to a gold standard, as a method of imposing macroeconomic discipline. Other popular views, however, run in exactly the opposite direction. Much recent research has argued that pegged exchange rates when combined with high capital mobility are highly crisis prone. This is often called the unstable middle or two corners hypothesis. Likewise one often hears allegations that financial markets are inherently unstable and hence generate unnecessary crises.

The purpose of this paper is to evaluate such claims by analyzing the effects of international sources of macroeconomic discipline, specifically international capital markets and the exchange rate regime. We begin with a brief review of the arguments that time inconsistencies can create the need for institutional arrangements to limit the scope of domestic monetary and fiscal policies. We emphasize the need to distinguish between actual constraints on policymaking, which are relatively rare, and the effect of these discipline devices on policymakers' incentives to implement time consistent policies.

We then discuss the effects of these sources of macroeconomic discipline in a number of frequently used economic models, most notably rational expectations and simple Mundell-Fleming (MF) and Phillips curve models. As Lane (1993) has argued, "market discipline means that financial markets provide signals that lead borrowers to behave in a manner consistent with their solvency."(p 55). He goes on to point out that "four general conditions are required for market discipline to be effective...open capital markets; good information....; no prospect of a bailout; and a borrower's responsiveness to market signals." (p 83).² We discuss that in many of the recent farsighted open economy rational expectations models that have become quite popular in the recent economics literature, these conditions are met. Their conclusions are quite consistent with the view that financial markets are a strong source of disciplines. However, the rash of recent financial bubbles has called into question the general empirical relevance of such models.

We therefore go on to show that the older Mundell-Fleming model of open economy macroeconomics based on the assumption of static expectations with a Phillips curve added also gives us a number of important insights about the effects of exchange rate regimes and the degree of international capital mobility on macroeconomic discipline with respect to both monetary and fiscal policy. Since many open questions remain even in these models, we also explore the implications of new views of the behavior of financial markets based on research on behavioral and neuro finance (Section 5). These allow the development of views of financial market behavior that lie between the

² Lane (1993) surveys a good deal of empirical literature on this subject and concludes that these conditions are sometimes but not always met.

extremes of the rational expectations, i.e., efficient market, models, and assumptions of wild irrationality. These perspectives suggest that contrary to rational expectations models financial markets will often fail to provide early discipline as macroeconomic excesses begin to emerge, but then do provide strong disciplinary effects once crises break out.

Based on such analysis section 6 offers an informal “model” of imperfect market behavior in which financial markets at times fail to provide substantial discipline as financial excesses develop. But, once a crisis breaks out, financial markets wake up and begin to provide substantial discipline in ways that are more consistent with the assumption of rational expectations. Even in crisis periods, however, we find examples of particular market responses that don’t seem to fit with the assumption of well-informed rational expectations. We do not expect financial market to always behave according to the highly simplified manner we sketch out, but in section 6 we consider several recent episodes, most notably the euro crisis and the recent economic crisis in the United States and discuss their consistency with the different models that we have reviewed. Section 7 concludes.

2. The Major Problems: Time Inconsistency and Political Pressures on Monetary, Fiscal, and Exchange Rate Policy³

Why does the need for macroeconomic discipline arise? Whenever the costs and benefits of a policy do not have the same time profiles, policymakers face time-inconsistent incentives. These incentives are particularly strong in macroeconomic policy because unanticipated macroeconomic expansions have differential price and quantity effects. In virtually all economies wages and prices are sticky in the short run rather than flexible. In addition, expectations matter, but are not based on full information rational expectations. In such a setting, quantities tend to respond more quickly to

³ We do not provide references to concepts that are discussed in standard macroeconomic or international monetary texts. We should note, however, that Mankiw's popular macro text (2013) wrongly states that the Mundell-Flemming model deals only with perfect capital mobility whereas in fact one of its advantages is that it deals with the full range of capital mobility from zero to perfect. An important implication is that a fiscal expansion can lead to either currency appreciation or depreciation depending on the degree of capital mobility. For such analysis see international monetary texts such as Pilbeam (2013).

changes in aggregate demand than prices. This gives rise to a non-vertical Phillips curve in the short run, which means that higher output and lower unemployment can be “bought” at the expense of a higher inflation rate. While this trade-off holds in the short run, this Keynesian short-run inflation-unemployment tradeoff disappears over the medium and longer term. It morphs into a vertical or even backward bending curve, implying that macroeconomic expansions are costly in the long run.⁴

This implies that the short-run effects of expansions tend to be more favorable than the long-run effects. In the same vein, the costs of anti-inflationary policies, i.e. high unemployment and slow growth, show up first while the benefits of these policies in terms of lower inflation often come with a substantial lag. With far-sighted governments and private economic actors these differences in timing would have only minor effects. Usually, however, policymakers and the public have short time horizons, caused by elections and fears of political instability. This increases policymakers’ discount rates, so that such time asymmetries can have powerful effects on government incentive structures. As a result, policymakers often face incentives to implement time-inconsistent policies in the form of overly expansionary monetary and fiscal policies, which generate high inflation. They also face disincentives to reduce such inflation through contractionary policies, especially in the months preceding important elections. These pressures can operate on both fiscal policies and monetary policies.⁵

Moreover, regarding fiscal policy the political pressures to expand government spending accompanied by deficit financing rather than increased taxation are not limited to exploiting short run Phillips curves. It is natural to favor more public spending that benefits you when others bear most of the costs of paying for them. Such demands for increased spending and lower taxation come from both particular interest groups (rent seeking) and the general public. Where institutional

⁴ It may bend backwards because higher rates of inflation tend to be more variable and generate more uncertainty that retards growth. For empirical evidence see the analysis and references in Burdekin et al. (2004).

⁵ These effects on monetary policy are especially strong where central banks are not fully independent, although here is a considerable literature showing that formal independence is often not sufficient to keep central banks from being influenced by political pressures. See Drazen (2000) and Willett (1988).

arrangements are not in place to link additional spending to immediate costs in terms of reducing other spending or increasing taxes there is a tendency to postpone the costs by deficit financing. One finds many examples of such behavior and not only in developing countries. The huge fiscal deficits of the United States and difficulties of getting political agreement on how to reduce them is a case in point.

The incentives to adopt expansionary fiscal and monetary policies and avoid contractionary ones are greater, the flatter is the short run Philips curve and the more slowly it adjusts toward the long run vertical curve where the trade-off disappears. Crucial ingredients in the slope of the short run curve are the degree to which policies are anticipated and the portion of the economy characterized by sticky rather than flexible wages and price. The latter can be heavily influenced by the exchange rate regime since flexible exchange rates make the traded goods sector effectively a flexible price sector. Thus where expansionary policies generate currency depreciation under flexible rates, the short-run Phillips curve becomes steeper than under a fixed rate regime and hence reduces time inconsistency incentives. The difference will be a function of the size of the traded goods sector relative to the non-traded sector, i.e., the degree of trade openness, and the amount of exchange rate changes. Likewise, financial market behavior can affect this trade-off by increasing the financing costs of deficit spending or reducing the positive growth effects by acting on negative expectations generated by deficit fears.

Given the prevalence of the types of time-inconsistent policy incentives just discussed, 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 such as the Stability and Growth Pact of the euro zone are useful.⁶

On the international side, there has been considerable interest in, and use of, fixed or pegged

⁶ These debates have two dimensions: whether such measures would be effective, in the euro case they were largely not, and whether these would be desirable if they were effective. There is still disagreement about the latter.

exchange rates as nominal anchors for the domestic price level (or at least for rates of inflation), and in the effects of international capital mobility and trade openness as external sources of discipline. Fixed exchange rates have been argued to provide monetary discipline because they restrain policymakers' autonomy with regard to monetary policy, especially when capital is mobile internationally. Financial market can exert discipline forces (of variable strength) on macroeconomic discipline when bond markets begin to charge higher interest rates and stock markets begin to fall over deficit fears. The mere expectation that such developments may occur has been argued to provide effective discipline.⁷

To understand the efficacy of external sources of macroeconomic discipline it is important to distinguish clearly between the *constraint* and *incentive* effects of different discipline mechanisms. *Constraints* are limits on the policy options available to policymakers. By definition, constraints imposed by a discipline device cannot be violated. In contrast, discipline mechanisms in the form of *incentive* structures affect policymakers' payoffs, but not the range of options available to them.

Unfortunately, a major difficulty with a considerable portion of the recent literature on exchange rate regimes as external sources of discipline is the assumption that all forms of fixed exchange rates act as effective constraints over domestic macroeconomic policies. However, only strongly fixed exchange rates provide constraints over monetary policy, although not over fiscal policy. In contrast, more softly pegged exchange rate regime (such as adjustable pegs) affects only incentive structures with regard to both monetary and fiscal policy.⁸ Likewise, international

⁷ Where bond financing is not a viable option, enormous pressures are placed on the central bank to finance the deficits through money creation, a process which helps explain the hyperinflation in Latin America in the 1980s.

⁸ It is important to look at the "effective" degree of fixity of the exchange rate regime. One must distinguish, for example, whether the fixed exchange rate is "permanent" such as the Gold Standard under which only catastrophe would force a country from its fixed rate, or whether it is more of a Bretton Woods type given by the institutional arrangements which determine what is required to change the parity. Exchange rate policy under the discretion of the executive is naturally much softer than under that of the legislature. Studies of central bank independence demonstrate that there can be considerable difference between official classifications and what occurs in practice. Even with soft formal institutional backing some pegged regimes have earned a reputation over time as a fairly hard fix. And of course recent case of Argentina provides evidence that a sufficiently severe crisis can force the abandonment of even a fairly hard peg. The tendency to attribute the effects of hard fixes to soft pegs has been a major problem in much of the early literature on exchange rate based sterilization. See Westbrook and Willett (1999).

financial markets only operate as an absolute constraint over fiscal policy when they have become so concerned about a state's fiscal solvency that the market for new government debt completely shuts down and monetary financing is not an option, as in Greece once the euro crisis was well underway. Under more normal conditions, however, financial markets provide discipline through their effects on policymakers' incentive structures, in particular by raising the cost of deficit financing and by signaling concerns about the government's macroeconomic policies to the general public.⁹

In the following sections we discuss how these incentive and constraint effects of international capital markets and exchange rate regimes operate in several popular models of open economy macroeconomics.

3. Incentive and constraint effects in popular models of open economy macroeconomics.

Most models concerned with the effects of various factors on macroeconomic discipline focus on two types of effects.¹⁰ First, the inflation-unemployment trade off and hence on the incentive to manipulate the macroeconomy in the short run and, second, on the ability and costs of funding budget deficits. We begin our brief review of these models with the types of rational expectations models that now dominate much of the recent formal literature by economists on open economy macroeconomics. These have made a number of important contributions such as the emphasis on the different effects of anticipated and unanticipated policy actions. However, the recent asset market bubbles illustrate that markets do not always operate according to the

⁹ Even when such incentives are generated, however, government may not always respond to them. As is discussed in the conclusion the conditions under which governments are more or less likely to respond has received much less attention and is an important area for further research. A few examples of differences in political economy models of government behavior are discussed below.

¹⁰ There is a long history of discussions of macroeconomic discipline which we do not have space to adequately review here. We should note, however, that much of the earliest literature on this subject focused on the perceived need to use the gold standard or some other regime of fixed exchange rates to keep in check what was seen by discipline advocates as the need to limit the discretionary ability of national governments to use paper money to inflate the economy. This contrasted sharply with the Keynesian view that exchange rates regimes should be designed to minimize the constraints placed over domestic macroeconomic policy. Over time this view of the need for discipline over tendencies to inflate moved much more into the mainstream as a result of the combination of high inflation in the later 1970s and 1980s and theoretical work on the role of expectations and time inconsistency problems.

assumptions of the rational expectations models.¹¹ Nor is their typical assumption of perfect international capital mobility always warranted. We therefore also consider the older Mundell-Fleming (MF) macro models. The original MF models assumed fixed wages and prices so that there were no short run tradeoffs between inflation and unemployment. The standard text book IS-LM models that underlie the basic MF models also implicitly assume that all policy changes are unanticipated and explicitly assume that there is excess capacity in the economy. As in much of the modern economics literature we supplement the simple MF model with the addition of a short run Phillips curve. Each of these classes of models gives us insight into important aspects of macroeconomic behavior but it is dangerous to apply either perspective to all circumstances.

3.1. Rational versus Static Expectations and Sticky versus Flexible Wages and Prices

Two of the most crucial differences across models that affect their predictions about financial market behavior and the incentives for governments to engage in harmful time-inconsistent macroeconomic policies are their assumptions about expectations formation and about the degree of wage and price stickiness in the economy. The more the economy fits with the Keynesian assumptions of substantial wage and price stickiness and the less well-informed and forward-looking are economic agents, the greater are the incentives for governments to exploit short-run inflation-unemployment trade-offs. On the other hand under the assumption of complete wage and price flexibility contained in some of the new classical macro models, there is little short-run trade off to exploit. And even with short-run rigidities a well-informed public with rational expectations would punish governments that attempted to exploit such short-run trade-offs.

Models based on well-informed and far-sighted rational expectations on the part of economic agents thus give the strongest support for the idea of financial markets as strong and desirable sources of incentives for macroeconomic discipline. In these models economic actors are typically assumed to be far sighted, to know the true model of the economy, and to be adept at recognizing any recurring patterns of policy behavior. While recent research has explored the

¹¹ Note that the recent literature has emphasized that the behavior of rational agents can contribute to the length and magnitude of bubbles as they attempt to ride the bubble up and then pull out before the crash.

implications of modifying many of the assumptions of the original models such as introducing costly information this is far too rich a body of literature for us to systematically address here. We therefore focus on the effects of discipline and two types of behavior generating excessive inflation resulting from incentives to exploit short run inflation-unemployment tradeoffs and excessive fiscal deficits resulting from political pressure to increase government spending and to lower or at least not increase taxes.

In many of the new classical models budget deficits per se have no effect on aggregate demand since the anticipation of the need to pay for these in the future leads the private sector to reduce consumption and raise savings to pay for the future increase in taxes, (the Ricardian equivalence assumption). Such shifts in private sector behavior offset the effects of government policies on aggregate demand. Moreover, in the context of well-informed and farsighted expectations and the absence of any market imperfections and moral hazard problems, financial markets exert macroeconomic discipline because they pick up on any early signs of fiscal excesses or emerging signs of currency overvaluation and immediately price a risk premium into interest rates. This in turn raises the costs of deficit financing and may alert some of the general public to emerging problems. In such a setting, open economy mechanisms to provide macroeconomic discipline would be irrelevant. Where domestic financial markets give appropriate signals their integration into international financial markets would provide no additional effects.¹²

More recent applications of rational expectations models have often assumed short run wage and price stickiness and these new Keynesian models allow for short run real effects even from anticipated policy changes.¹³ For these types of models a crucial issue becomes how well macroeconomic policies are anticipated. Ongoing high inflation, for example, is almost always largely anticipated, hence the roughly vertical long run Phillips curve. Many new classical

¹² However, where there is imperfect information, short run inflation-unemployment tradeoffs can still exist even with rational-expectations. In such models there can remain incentives for governments to overinflate, although these incentives will be weaker than if expectations are static or backwards looking.

¹³ The exploitation of short run asymmetries are important for governments engaging in strategic behavior and are explored in the vast literature on political business cycles. The incentive to engage in such behavior becomes stronger as elections approach and as they are expected to be closer.

economists have tended to assume that the cases of unanticipated policy changes are relatively unimportant, but a high proportion of important changes in macro policy actions, as opposed to ongoing trends, have large unanticipated components since they tend to have effects on the real economy.

A particularly serious type of failure of fiscal discipline occurs where governments believe that they are too politically weak to control public spending relative to revenue. Many of these political pressures are generated by microeconomic rent seeking considerations and would not be substantially reduced by a lack of fiscal effects on aggregate demand. Such cases of governments which cannot control their fiscal deficits are the basis for the first generation of currency crises models. In the extreme form of such cases a crisis is inevitable. The most that various institutional arrangements and open-economy considerations can do is to affect the form and timing of the crisis. Under these circumstances rising interest rates and currency depreciation under flexible exchange rates would make no difference. As the willingness of financial markets to buy government debt, even at extremely high interest rates, dries up, the government does face an absolute constraint on its ability to issue debt. This leaves only monetary financing as an option. With flexible rates their process can continue indefinitely with the corresponding currency depreciation.

Fixed exchange rates, however, are unable to provide effective discipline. As long as there are international reserves to run down the process can continue and in the first generation models of small open economies this is not accompanied by rising inflation because domestic prices are set in the international market. But as reserves run out the currency collapses and the economy moves to the scenario of currency depreciation. Of course official financing from abroad can loosen this constraint as in the case of the Greece crisis during the euro crisis.

In the real world such fiscally generated hyperinflation does not last forever. The effects on the economy become so damaging that at some point the old regime breaks down and a new regime, which may or may not generate more discipline, replaces it. In cases of intermediate degrees of political strength the analysis of discipline mechanism requires careful attention to the specifics of

political economy structures.

3.2. The Mundell-Fleming model

The basic Mundell-Fleming model is a short run oriented Keynesian model which assumes static expectations, i.e., that no changes are expected. Its predictions are most useful for the analysis of the short run effects of unanticipated policy changes where the fiscal solvency of the country in question is not in doubt. As discussed above, the slope of the short-run Phillips curve is an important determinant of governments' incentives to engage in undisciplined macroeconomic behavior. Thus it is important to evaluate how exchange rate regimes affect the slope of the Philips curve. Compared with a closed economy, fixed exchange rates flatten the short-run Phillips curve because they increase the effective size of the sectors with price stickiness in the economy. Domestic economic expansion will not initially affect the price of imported goods as long as the exchange rate is fixed. The resulting relatively flat short run inflation-unemployment trade off increases the incentives to adopt time inconsistent policies to maximize short run political benefits.¹⁴ Currency depreciation, on the other hand, steepens the short-run Phillips curve, because flexible rates in effect increase the size of the flexible price sectors. The depreciation causes the domestic currency prices of imports to rise quickly, making the trade-off steeper. The more open the economy, the greater are these effects.

Macroeconomic discipline is affected jointly by the exchange rate regime and the degree of capital mobility. For monetary expansion, the magnitude of depreciation under flexible rates will be greater the higher is the degree of international capital mobility. This steepens the short-run Phillips curve further and hence reduces the incentives to use it for political gain (as opposed to combating a recession). For fiscal expansion, the effects under flexible exchange rate depend on the degree of capital mobility. If it is low, fiscal expansion leads to depreciation, while if capital

¹⁴ This is contrary to the analysis by Romer (1993). His model effectively assumes flexible exchange rates. Its effect depends on the accompanying exchange rate regime and degree of capital mobility.

mobility is high, an appreciation is generated.¹⁵

Under fixed exchange rates, if capital mobility is high any attempt to expand the money supply is offset by capital outflows. The combination of high capital mobility and fixed rates thus undercuts the ability of a country to follow an independent monetary policy and provides an absolute constraint effect on monetary expansion, as the open economy trilemma or unholy trinity analysis shows. However, where capital mobility is substantially less than perfect, as is the case for many countries,¹⁶ the trilemma provides only a long run constraint over monetary policy. In the short run this constraint can be violated and discipline effect weakened. Indeed, under these conditions time inconsistency problems will be increased (Willett 2007), and this effect is especially strong where the exchange rate is an adjustable peg rather than a hard fix.

High capital mobility under a fixed rate is also a two edged sword. While it does place a constraint on discretionary monetary policy, it also makes it easier to finance budget deficits by reducing the effect of the deficits on interest rates. It also undercuts the independence of monetary policy. One might think that the greater the number of potential mechanisms to promote discipline the stronger the net effect will be. This is not always the case, however. In a relatively closed economy an effectively independent central bank would remove the problem in time-inconsistent monetary and would provide at least some discipline over fiscal policy in the sense that with the absence of monetary financing fiscal expansion would force up financing costs. With high capital mobility under fixed exchange rates, however, the initial upward pressure on interest rates from fiscal deficits would attract massive capital inflows that the central bank could not sterilize. This in turn would force domestic monetary expansion against the efforts of the independent central bank, making it easier for the fiscal authorities to generate political cycles (Clark et al. 1998).

Of course with hard fixes such short run expansions must be offset by future contractions. Thus fixed exchange rates in an open economy generate two conflicting effects relative to a closed

¹⁵ Economic expansion in the MF model worsens the trade balance but increases interest rates that in turn generate capital inflows. The net effect on the balance of payments under fixed rates or the value of the currency under flexible rates depends on the relative size of the trade balance and capital flow effects.

¹⁶ For a survey of studies on the degree of international capital mobility, see Clark et al (2012).

economy. The flatter short-run inflation-unemployment trade-off increases the incentive to manipulate the economy in the short run while increasing the longer term costs. The balance of these forces will depend in substantial part on the government's time rate of discount. The stronger are short term political pressures the higher will be the government's discount rate i.e., the shorter will be its effective time horizon. Thus a hard fixed exchange rate does generate a constraint on long run rates of inflation, the level of this constraint being set by that of the country or currency bloc to which the rate is fixed¹⁷. However, this does not necessarily eliminate incentives for instability generated by short run manipulation of the economy.

While they are often conflated in policy discussions, the discipline effects of soft fixes, i.e., adjustable pegs, can differ substantially from those of hard fixes. The short run political benefits of short run macroeconomic expansion are similar in both types of exchange rate regime, but the longer run costs are likely to be less for the adjustable peg since an exchange rate devaluation can be substituted for deflationary macroeconomic policies.

Of course the alternative of devaluation under a soft fix is not costless. These costs will be greater, the stronger the degree of the government's public commitment to defending the peg and the greater is the openness of the economy. The latter is important because the greater the trade openness, the higher will be the domestic inflationary effects of the devaluation.¹⁸ The costs will also be higher the greater are the country's net foreign currency liabilities.¹⁹ Moreover, while greater wage and price stickiness increases the short run benefits of expansion, they also increase the costs of future contraction.

In summary, in terms of monetary policy a soft fix does not provide a constraint over longer term inflation and the effects on the incentives to inflate are conflicting. Unambiguously, the disciplinary effect on inflation should be greater with hard than with soft fixes. This conclusion is

¹⁷ Different rates of productivity growth can, however, generate small differences in the rates of inflation among members of a common currency.

¹⁸ The political effects of this inflation will be somewhat offset by the increased attractiveness of exports. The relative political importance of these effects will depend on the structure of the economy, the position in the election cycle, and the distribution of political influence. See Frieden (2002), Frieden et al (2001), and Walter (2008) and (2009).

¹⁹ See Walter (2009) and Walter and Willett (2012).

supported by empirical evidence (Chiu et al, 2012). In contrast, with the static expectations of the Mundell-Fleming model, neither domestic nor international financial markets provide short run discipline over fiscal policy. Indeed, as noted above higher international capital mobility will lower the interest rate costs of financing deficits. It is not obvious that exchange rate regime would have a substantive influence on fiscal policy and Chiu et al (2012) find no significant differences.²⁰

4. Theories of Imperfect Financial Market Behavior: Perverse Incentives and Behavioral Finance

The new classical rational expectations and MF models share in common the assumption of rational economic behavior but differ largely in their assumption about expectations formation. However, neither focuses on the types of aggregation problems that can lead rational behavior on the part of individual economic agents to generate outcomes that are economically inefficient, i.e., on cases where Adam Smith's invisible hand does not work well. Perhaps the best know examples of such situations come under the heading of principal agent problems. For numerous reasons it is often difficult to develop a structure of incentives within an organization, especially in large ones, that fully align the interests of economic agents that induces them to pursue behavior that maximizes the aggregate efficiency of the institution. For example it has become common to argue that the large financial institutions that were at the heart of the global financial crisis were not only "too big to fail" but also "too big to manage". In the spate of recent books on the US financial crisis numerous cases have been documented where CEOs, and much less the typical shareholders, had little idea of the risks that these financial institutions were taking on. Nor did the mid-level managers and traders have strong incentives to properly take these risks into account. Their compensation typically rested much more on the short-term returns they were generating than on the longer term risks being generated. Desires to increase, or at least not lose market share, resulted in competition led institutions to take on more risk rather than behaving more prudently, i.e. there was more of a race to the bottom rather than a race to the top.²¹ Similarly a number of papers have

²⁰ See also Tornell and Velasco (1998) and (2000) and Tyell and Wei (2004).

²¹ See Willett (2012).

shown that both common incentive structures in the financial sector and costly information can lead to rational herding behavior.

The behavioral revolution within economics has pushed beyond these fully rational explanations of imperfect market behavior to analyze the roles of human cognitive limitations and biases in decision making that can also contribute importantly to imperfect market behavior.²² This approach that is spreading rapidly in the economic profession, draws both on the concept of bounded rationality associated with Herbert Simon and on the literature on decision making in cognitive psychology and neuro science. These not only document many common biases in individuals' decision making but also in many cases how these biases have developed in evolutionarily adaptive ways given that humans do not have super computers in their brains. In many cases, however, we find that tendencies such as overoptimism that were adaptive in earlier environments can prove to be dangerous in the modern financial world.

Economists have given a mixed reaction to these expansions of the traditional domain of economics. While being embraced by an increasing number of economists, the behavioral approach has been subject to strong negative reactions by others. One frequent criticism is that the behavioral literature does not point toward a unified theory of behavior. While we agree, as we discuss below, we see that as a virtue. On the side of the behavioralists some see their works as an attack on traditional economics while others see their work as supplementing rather than fully replacing the traditional rationalist models of economics.

We fall squarely in this later camp. A key insight from the recent behavioral literature and the focus of complexity economics on nonlinear behavior that has been overlooked by a good deal of economic analysis, it is that markets can behave in different ways at different times and under different circumstances. And this is not just a matter of markets in the early stages of financial development. Indeed a key lesson of the global financial crises is that the differences in the behavior of the financial sector in advanced and emerging market economies were not nearly as

²² See for example Bookstaber (2007), Burnham (2005), Fox (2009), Mandelbrot and Hudson (2004), Montier (2002), Peterson (2007), Shefrin (2000), and Shiller (2008).

great as was commonly assumed by experts in the advanced economies, prior to the crisis.

Like any field there are numerous analyses in behavioral economics and finance that are open to justified criticism. One of the most common criticisms of the whole field, however, we believe is strongly flawed. This is that the behavioral approach does not lead to a general theory of behavior. But one of the most important conclusions at this approach is that we should not expect to always be the same under all circumstances. We see the need for more nuanced analyses where we attempt to construct an increasingly broad range of contingent analysis that focuses on what types of conditions make particular types of behavior more or less likely to occur. From this perspective we believe that standard efficient market analysis is highly valuable for the behavior of many markets during normal periods but that its explanatory power falls sharply in many periods of boom and bust.

Of course rational expectations economists have always acknowledged that not all market participants will behave in fully rational ways. Efficient market theory rests heavily on the assumption that the behavior of rational actors will offset the effects of irrational ones and hence determine market prices. A fundamental premise of the behavioral approach is that the amounts of arbitrage needed to bring about this result are not always available. Such “arbitrage” is often highly risky and not infrequently faces institutional obstacles such as legally imposed limits on short selling. The study of such “limits to arbitrage” is an important aspect of financial research.

Human cognitive limitations make it necessary for us to operate on the basis of simplified views of the world. The common desire for certitude frequently leads to excessive faith in the correctness of particular views or theories or mental models. The tendency to overestimate our abilities can lead us into strong beliefs we are right and other viewpoints are wrong.²³ The well documented tendency toward confirmation bias can lead us to focus on the evidence that supports our views and ignore or heavily discount evidence that conflicts with it lead at times to behavior that deviates substantially from that predicted by rational expectations models.

²³ On the role of flawed mental models in generating the global financial crisis, see Willett (2012).

In the following section we sketch out an informal theory of how such behavior biases can sometimes lead to financial market behavior that is too complacent for substantial periods of time and fails to pay sufficient attention to emerging signs of problems ahead. Once a crisis breaks out, however, markets shift gears in response to such wake up calls and become a powerful source of discipline. Of course there are also behavioral theories that can support the view that rather than switching to a rational expectations behavior, the switch leads markets to panic and over react. While granting that such behavior does undoubtedly occur, we believe that our “model” of a switch to fairly rational expectations does hold in a number of cases.

5. An Informal Model of Imperfect Financial Market Behavior

In this section we sketch out an informal “model” or one scenario about financial market behavior that we believe has useful explanatory power for the analysis of effects on discipline. We would be the first to agree that our story does not explain all financial market behavior. We do believe, however, that it does have considerable explanatory power.²⁴

Typically asset market booms and capital surges start with some type of “innovation” such as financial liberalization and other economic policy reforms, as in Argentina, East Asia, and Mexico, and the creation of the euro zone in the 1990s. In the initial stage, it is quite rational and efficient for a substantial amount of capital to be attracted to these new opportunities. At times, however, such major reallocations of financial assets begin to take on a dynamic of their own involving various mechanisms of investor herding, both rational and not, usually encouraged by the spread of stories claims that “this time is different”. As discussed in the previous section, the success of such initial capital flows can generate the encouragement of further flows, which push adjustments well beyond what is warranted by the fundamentals. Such success strengthens investors in their beliefs. The “well-informed” investors put increasing faith in their perceptions, or stories, or mental models that launched their initial reallocation of funds (overconfidence). They become

²⁴ In the following section we give several examples of episodes that we believe fit with the model rather well.

complacent and begin to search less diligently for new information and when information turns up that is inconsistent with their views they tend to ignore or discount it heavily (confirmation bias). As this process continues, the success of the initial investors begins to lure in less informed actors and herding in mental models is joined by the types of follow the leader herding more usually discussed in the literature. Momentum feeds on itself.

In this phase the market pays relatively little attention to early warning signs of trouble and thus provides little discipline. Indeed it can even generate the opposite of discipline by making it easier for governments to find financing and can give them a false sense of security about their policies as they are being validated by the market. Then at some point comes the moment of truth. Negative developments become so strong that they cannot be ignored even by complacent investors. The investors who considered themselves well informed discover that they had not been so well informed after all. These results in greatly increased scrutiny often called wake up calls or broken mental models (Willett, 2000).

Attitudes toward risk in the market can turn quickly, and when agents discover that they had greatly misunderstood what was going on, it is quite reasonable for them to run to safety and become extremely risk averse until they are able to reevaluate the situation. As crises break out a period of rather blind retrenchment is not at all uncommon and often results in contagion hitting other markets and countries. It is common to argue, especially by officials in crisis-hit countries, that in such circumstance financial markets typically overreact. They switch from excessive optimism to excessive pessimism and panic resulting in discipline that is far harsher than is justified and that completely innocent countries are hit by indiscriminate contagion.

Undoubtedly such overreactions do sometimes occur and some contagion hits countries that are not in bad shape. However, these periods of largely uninformed switches in behavior are usually fairly short lived as the market participants begin to place considerable effort into analyzing the situation in response to the wake-up call. Soon the market begins to differentiate in a fairly reasonable manner. As market participants make new assessments, much more differentiated results

begin to emerge that start to approximate the behavior of rational expectations models.²⁵ Markets then begin to place more appropriate discipline on the policy actions of governments in the crisis countries. Interest rates on government debt begin to rise sharply both because of revised expectations and increased risk aversion and capital surges are replaced by sudden stops. The markets begin to often provide strong discipline. Even in the crisis phase we do not expect the financial markets to always behave in ways consistent with well-informed rational expectations. As we illustrate in the following section sometimes they still appear to be too optimistic and forgiving just as sometimes they will become too pessimistic. On balance, however, we suggest that the markets tend to behave more closely to the well informed rational expectations view than in the periods running up to the crisis.

In summary, our “model” of imperfect market behavior is not based on the types of wildly irrational behavior often assumed by market critics. Rather, we argue that the major market failures tend to come before crises break out and take the forms of providing insufficient discipline over mounting public and private financial excesses. In this phase market behavior has some similarity to the static expectations Mundell-Fleming model. In both cases the markets are too forgiving rather than too harsh and fail to provide the discipline over both public and private sector financial excesses that would be expected from financial markets dominated by far sighted rational expectations. Once crises break out, however, in our model such optimism is destroyed and markets start to behave much more efficiently.

6. Some Illustrations

To show the usefulness of our “model”, we now turn to a discussion how it can help us understand some recent events. As discussed above, our model implies that in the initial phase, there is often too little discipline in macroeconomic policymaking. For example, as we discussed above, it is possible under fixed exchange rates that international capital flows respond to interest

²⁵ Thus, in our simple “model” we skip over this usually brief transition period and focus on the stage where the market switches to more rational expectations after the crisis hits and begins to provide a generally appropriate degree of discipline.

rate changes in such a way as to undercut central bank efforts at monetary tightening in the face of large fiscal deficits. An illustration is the initial easy financing of the large fiscal deficits of Greece in the euro zone. Overall the European Central Bank followed a successful anti-inflation strategy but yield-seeking investors who believed that Greece's entry into the euro zone made its government debt safe rushed to finance Greece's budget deficits at interest rates far below those that would have reigned had Greece still had its own currency.²⁶ As a consequence, for years the Greek government faced essentially no discipline over its budget deficits from financial markets. Its participation in a common currency thus made its deficit financing much easier.²⁷ In this case while adopting the hard fix of a common currency backed by a strong independent central bank provided strong monetary discipline for countries like Greece, it also initially accommodated a lack of fiscal discipline. A similar lack of financial market discipline occurred with respect to the real estate bubbles in euro zone countries like Ireland and Spain.²⁸

In some cases, global financial markets not only failed to provide early discipline over financial excesses, but actually contributed to the generation of the excesses. A familiar story of the generation of financial crises goes as follows. Financial liberalization and economic policy reforms make a country more attractive for foreign investment. The resulting capital inflows then generate excessive credit growth, leading to poor domestic investment decisions and eventually a financial crisis (Kindleberger and Aliber 2011; Reinhart and Rogoff 2009). There can be little question that this scenario sometimes holds, but careful research indicates that it is much less common than is often supposed.²⁹ For example, central banks in East Asia succeeded in sterilizing the vast majority of the capital that flowed in prior to the Asian crises of 1997-98 (Willett et al 2005; Ouyang et al. 2008). Thus in these cases we see the financial excesses as more home grown than as being generated by global financial markets. In the euro zone the investments flowing into real estate

²⁶ Analysts differ in their judgments about how much of this easy financing was due to moral hazard versus imperfections in the behavior of the financial markets.

²⁷ Note that in theory the Maastricht criteria should have provided a constraint on Greece's fiscal policy, but due to false statistical reporting, these constraints were not implemented.

²⁸ Countries with their own currencies and flexible exchange rates were not immune to real estate bubbles, however, as the UK and US illustrate.

²⁹ See Amri et al (2013).

markets and the financial instruments based on them likely did contribute substantially to the magnitudes of the resulting bubbles. It is extremely difficult to make a case that the financial markets in these cases were operating on the basis of well-informed rational expectations. It is equally difficult, however, to argue that domestic financial institutions were largely the innocent victims of exogenous inflows of foreign capital. The same is true with respect to the US housing bubble and large budget deficits. It has been popular for some US officials (and even some academics) to argue that the US financial crisis was generated by the huge capital inflows that they believe were generated by a global savings glut. There has been a debate about the extent to which these huge capital inflows were generated by “excessive” savings in countries like China and just how much they tended to lower interest rates in the US. Many economists are highly critical of former Federal Reserve Chairman Allan Greenspan’s argument that the effects of these capital flows were so dominant that the Fed lost its ability to influence any but very short-term interest rates. Unwillingness to rock the boat and excessive faith in the ability of the financial sector to police itself are likely much more important reasons for the Fed’s continued easy money policies as the real estate bubble grew. International capital flows undoubtedly did contribute to the magnitude of the US financial crisis, but it seems quite unlikely that they were a major cause. There were plenty of purely domestic causes.³⁰

While we have found that rather than being the demanding guardians of sound finance, financial markets are often far too tolerant and fail to do sufficient due diligence in the run-up to major crises. They typically focus on only a few major considerations at one time and often see these through optimistically biased glasses. When fundamental disequilibria continue to build, however, eventually some event or influences of events sets off a crisis and shocks the market into waking up. Examples are the forced devaluation of the Thai baht in 1997, the publication of revised estimates of the Greek budget deficits that showed them to be far larger than had previously been

³⁰ See, for example, the analyses and references in Willett (2012). It is important to remember that domestic institutions were often the active agents in borrowing from abroad. Not all capital flows, either before or during crises, are initiated by foreign investors. When the financial excesses are coming from the public sector it is even more difficult to argue that international financial markets are a major active agent in generating such excesses, as opposed to passive factors that make financing easier.

thought, and the failures of Bear Sterns and Lehman Brothers in the US.

When such dramatic events occur, they send wake up calls speeding through the market and the previous focus on positive considerations is switched to a focus on the negative ones. Then financial markets do often start to provide strong discipline. In the case of extremely severe fiscal crises such as hit Greece, the markets may go beyond charging high interest rates and begin to refuse to provide financing at any price, i.e., the market for new debt from that government shuts down completely. In such rare cases market discipline goes beyond incentives and provides a true constraint on financing. While Argentina for years was able to undercut efforts at official discipline from the IMF by continuing to have access to financing from the private market³¹, by 2011 Greece did not have that option even if it were willing to pay huge interest rates.

With an independent currency it is quite likely that Greece would have financed its deficits with monetary expansion and inflation but as a member of the euro zone this option is not available. Thus while the establishment of the euro zone and over optimism made it easier for Greece's fiscal excesses to mount, once the crisis finally broke out reasonably efficient behavior by the financial markets and the fixed rate constraint on monetary expansion imposed by membership in the common currency did begin to provide strong discipline.³² If the discipline imposed on Greece has been too harsh, as a number have argued, it seems likely that this has been due more to the terms of conditionality imposed by EU officials than to excessive pessimism by the markets.

Undoubtedly, when crises break out, over-optimism often does give way to excessive pessimism. But in their pessimistic moods, the financial markets frequently come closer to accuracy than in their optimistic ones. The euro zone crisis provides vivid examples. Officials frequently alleged that the negative signals from the markets were due to evil speculators making unjustified attacks on government debt and attempting to threaten the euro zone itself. French officials even opined that these speculators such be thrown into dungeons as in days of old. Nonetheless, although no doubt sometimes the markets did place excessive risk premia on the crisis countries' debt, the

³¹ See Bluestein (2005).

³² On the euro crises see the analysis and references in Willett and Wihlborg (2013).

track record shows that there has been a strong and persistent tendency for officials to understate the magnitudes of problems such as the extent of bad loans in the banking sectors and to overestimate positive factors such as expected economic growth. No wonder that markets tend to perceive situations as being much worse than officials would like them to believe. Denial is a common human trait to which officials are not immune.

In the euro zone case, commentator after commentator has argued that in the absence of strong market pressures, government efforts to deal with the various problems that generated the crises would soon slacken. For example, *The Economist* (2013) writes, “It was the threat of financial panic that kept euro-zone leaders up until dawn hammering out rescue deals and promises of reform.” (p14) European officials have become famous for ending meetings with declarations that they will “do whatever it takes” to end the crisis and preserve the euro. Initially markets tended to react favorably to such pronouncements, but when it became clear that such statements were not being backed by sufficient actions, market confidence typically began to wane and the risk premia in interest rates began to rise again. As this game continued, it became clear that the “we’ll do whatever it takes” statements referred primarily to easing short term market pressures and the half life of such announcements soon plummeted. The phrase “kicking the can down the road” soon became popular in press reports.

In the short run, the markets often seemed to remain gullible to official announcements of alleged progress rather than being excessively cynical. When actions did not follow the words market pressures soon began to exert themselves again. A promise that has had a much longer term effect, however, was the promise by Mario Draghi that the European Central Bank would do whatever it takes to save the euro and followed this up by flooding the markets with liquidity. This has resulted in widespread calm in the markets, which began to pay much less attention to the substantial policy problems that remain unsolved. Indeed the *Economist* article quoted above refers to the markets as having become “anaesthetized”.

In contrast, some studies have concluded that the risk premia charged by the markets have

averaged several percentage points too high relative to what should be dictated by the fundamentals.³³ Typically, however, the fundamentals used to generate such estimates of “correct” risk premia have been far too simple, based on just a few statistical indices such as budget deficits and debt-to-GDP ratios. It is prospects of future developments that drive efficient market prices, and these have been rightly heavily influenced by perceptions of political dysfunctions at both national and the euro zone levels. Thus it makes good sense that risk premia are considerably higher than would be expected based on statistical indicators alone. How much higher is impossible to say with any degree of accuracy, but compared with the over optimism of official statements, the market perceptions seem to have been considerably more realistic and, as argued above, at times they appear to have become too forgiving even during the crisis.

It is important to remember also that while there do exist the cut throat speculators pronounced by some officials as deserving of the torture chambers of Ancient days, many of the market actors helping to determine interest rates are “innocent” victims of the crises who are trying to minimize their losses. Their only crime was failing to anticipate the crises. The same was true in the Asian crisis where a considerable portion of the capital outflows generated by the crisis came from actors attempting to minimize the losses from their previous uncovered financial positions, not outright speculator’s seeking gains (Willett et al., 2005).

As the euro crisis has unfolded, it has become clear that markets have not lost the power to discriminate, albeit imperfectly. They have tended to recognize cases of genuine policy actions to deal with the crises such as in Ireland and lowered risk premia accordingly. This provided incentives for improved policies on the up as well as down sides. There is a common element of risk premia in all of the crises countries reflecting concerns about the malfunctioning of euro zone institutions, but over and above this there has been considerable differentiation, which gives incentives to governments to make fundamental adjustments.

These have been blunted at times by the actions of the ECB in providing massive amounts

³³ See, for example, De Grauwe and Ji (2012).

of liquidity. These have been based on legitimate concerns about the costs of markets that have ceased to function normally, making it difficult for small and medium sized enterprises to obtain credit and thus keeping unemployment high and growth slow or negative. Many commentators have noted, however, that as soon as market pressures abate, as they have a number of times during the ongoing crisis, the willingness of euro zone leaders to take the costly measures needed to contain the crises quickly slows down. The market reactions to the ECB's liquidity provision have been much more consistent with short-time horizons than of farsighted rational expectations.

Thus the ECB has faced a nasty trade-off. Actions to improve credit provision in the short-term reduce the pressures on national governments and euro zone officials to take actions that are economically and politically costly in the short run but that are necessary for the longer term benefit of finally bringing the crisis under control – the classic time-consistency problem. The ECB has tried to deal with this problem by tying promises of continued large liquidity provision to government actions. So far, however, such conditionality has had only quite limited success, hampered in large part by its success in calming market pressures. Perceived dangers of contagion and worsening economic situations blunt the incentives of central banks, even where "independent", to exert maximum discipline over the actions of national governments in Europe.

The same phenomenon has been observable in the United States, where monetary ease and safe heaven concerns in domestic and international financial markets have kept interest rates on US government debt at incredibly low levels despite massive current and projected future deficits and the political stalemate that hinders forceful action to reduce future deficits. Projections of a future crisis that would likely result from continued failure to take forceful actions to reduce future deficits have so far had little disciplinary effect on government actions. Of course, assumptions that policies to get the long run deficit problem under control will be enacted in sufficient time could turn out to be correct. It seems much more likely, however, that the low interest rates in the US financial markets are generated largely by slow economic growth and short-time horizons and/or over optimism that something will be done to deal with these problems, rather than by long-horizon

rational expectations in financial markets.

7. Concluding Remarks

We have seen that popular assertions that fixed exchange rates and financial markets exert strong discipline over macroeconomic policies are often overstated. Incentives for discipline are generated under some circumstances and not others. We find that financial markets do not always operate in the farsighted, efficient manner often assumed in economic models. Nor, however, does the view that misbehavior by financial markets is a major independent cause of currency and financial crises stand up to the evidence.

We hope to have shown that for the analysis of such issues a number of different types of economic models can be useful in analyzing these issues, but that no one is sufficient by itself. This includes our own informal model sketched out in section 5. We believe that it offers useful insights but it has far from complete explanatory power.

We also stressed the importance of distinguishing between incentive and constraint effects of discipline mechanisms between hard and soft fixes of exchange rates, and between effects on monetary and on fiscal policies. Thus analysis of external influences on macroeconomic discipline does not yield simple general purpose answers.

While the existing literature gives us many important insights into such issues there is much that we still do not know. We would point to two areas where we believe further research will be particularly valuable. One is the ways in which financial markets may behave differently under different circumstances. In our view, future research will need to draw heavily on developments in behavioral finance and complexity economics to develop better models of how financial markets behave in different states and of the factors that generate shifts from one state to another

The second issue is that even when markets give efficient signals of growing problems, governments do not always respond to these incentives. To date most of the literature on macroeconomic discipline has focused primarily on the behavior of financial markets or the roles of

policy regime as absolute constraints. On the political economy side a good deal of attention has been given to the factors that generate inappropriate government policies but much less attention has been given to the political economy factors that influence how governments respond to the incentives for discipline provided by financial markets and exchange rate regimes. On this issue analyses based on fairly well informed actors will of course be important but we believe that recognition of the cognitive limitations and biases documented in the literature on cognitive psychology and neuroscience is likely to be quite valuable as well.

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