

**Monetary Policy and Exchange Rates:
Theory and Practice**

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Abstract

We review how the literature on the optimal design of monetary policy in open economies, and its connection with the exchange rate regime, has evolved since the 1970s. From a theoretical perspective, earlier contributions stressed the specific nature of the shocks affecting the economy. By contrast, recent work has emphasized the connection, or lack thereof, between the exchange rate and international relative prices. We argue that in practice such considerations are only some of the elements to be taken into account, with institutional factors also playing an important role. We illustrate this argument with the specific case of the exchange rate regime in Hong Kong.

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1. Introduction

The design of monetary policy, and the associated choice of exchange rate regime, played a prominent role in Alexander's lectures at the Institute in the late 1970s which one of us attended between 1978 and 1983. This focus reflected the collapse of the Bretton-Wood system in 1971. Prior to that profound change, central banks typically fixed the exchange rate, subject to infrequent realignment. The breakdown of that framework required central banks to figure "what to do next" with monetary policy. They broadly faced two main options: they could fix the exchange rate with respect to another currency than the U.S. dollar, or instead opt for an independent policy, but then had to decide on the exact strategy in setting a nominal anchor. The European Community offers a clear illustration with a number of attempts to create a new exchange rate arrangement, starting with the "snake in the tunnel" in 1972, which aimed at limiting exchange rate movements between European currencies (the "snake"), while allowing them to move against the dollar as a group (the "tunnel"). The "tunnel" component soon collapsed following the floating of the US dollar in 1973. Furthermore, monetary policy in the participating currencies reacted to the drastic rise in oil prices in 1973 in incompatible ways, leading to sharp exchange rate fluctuations among European currencies and entrances and exits from the snake.¹ This failure led in turn to the establishment of the European Monetary System in 1979. In sum, positive and normative exchange rate questions had a high profile in academic discussions in Geneva and elsewhere in the late 1970s.

¹ Thus, UK and Ireland left the Snake in June 1972 and Italy in February 1973. France left in January 1974, rejoined in July 1975 and left again in March 1976. By the end of 1977, only Germany, Belgium, the Netherlands, Luxembourg and Denmark remained within the mechanism.

In this paper, we first review how the literature on the appropriate monetary policy regime in an open economy, and its close connection to the exchange rate regime, has developed over the last thirty years. We then discuss some considerations that play a role in the practical choice of the policy regime. Section 2 takes a theoretical perspective. We first review the open-economy extension of the celebrated analysis of Poole (1970), which very much constituted the standard toolbox used to think about the exchange rate regime in the late 1970s. We next present the main message from a range of recent contributions relying on state of the art ‘dynamic stochastic general equilibrium’ models. These models entail limitations along several dimensions, with most contributions for instance taking central bank credibility for granted. Section 3 thus reviews several points of practical relevance, namely the role of the exchange rate as a nominal anchor, financial integration, the role of institutions, and exit strategies. Section 4 illustrates these practical aspects by a case study of Hong Kong, and section 5 concludes.

2. Monetary policy in the open economy: theoretical considerations

2.1 Modelling then: Poole in the open economy

The main challenge facing the central bank in an open economy is to achieve both internal and external stabilization, as discussed in Mundell (1968). The central bank thus needs to design its policy taking account of the impact on the exchange rate as well as on international capital flows. The analysis assumes that the central bank’s ultimate objective is to stabilize the business cycle, and focuses on which intermediate objective was best suited. In particular, should the central bank stabilize the interest rate or smooth fluctuations of monetary aggregates? The standard paradigm used to think about the issue in the late 1970s was Boyer’s (1978) open-

economy extension of Poole's (1970) celebrated closed economy analysis of the central bank's choice between operating with an interest rate of money stock objective.² The framework inherits the main aspects of the Poole model: the analysis is static, prices are assumed to be sticky and determined by aggregate demand (thus, direct exchange rate effects on prices were disregarded). By stabilising aggregate demand, the central bank can therefore stabilise inflation.

The analysis emphasises how the optimal policy depends on the exact nature of the shocks affecting the economy. Specifically, a flexible exchange rate is preferable when the economy is mostly subject to aggregate demand shocks. A rise in aggregate demand boosts GDP and the demand for money, leading interest rates to rise in order to ensure monetary equilibrium. Higher interest rates in turn attract capital inflows, leading under floating exchange rates to an appreciation of the currency that reduces export competitiveness and aggregate demand. In equilibrium, the aggregate demand shock has no impact on aggregate output as it is exactly offset by the exchange rate appreciation. By contrast, a fixed exchange rate requires the central bank to accommodate the capital inflow through a monetary expansion, leading to a rise in output.

The policy prescription is reversed if monetary shocks are predominant. Under floating exchange rates, an increase in velocity shock leads to a reduction in the interest rate as the demand for money demand falls. Capital then flows out of the country, attracted by the higher returns in foreign currency. This triggers a depreciation of the exchange rate, leading to an increase in output by improving the trade balance. Under a fixed exchange rate, however, such a shock has no impact on economic activity, as the incipient depreciation of the exchange rate would force the

² The Poole analysis received a new lease on life in the literature on "monetary conditions indices," e.g. Lewis (1997) or Gerlach and Smets (2000).

central bank to tighten monetary policy. With the exchange rate remaining unchanged, exports and output are kept constant.

In sum, the open-economy extension of the Poole analysis showed that stabilizing real activity called for a flexible exchange rate to act as a shock absorber in the presence of real demand shocks, but for a fixed exchange rate to automatically undo the impact of monetary shocks.³ Since there was no reason to believe that only one type of shock mattered, the policy conclusion was that some intermediate degree of exchange rate flexibility was generally desirable. Absent any estimates of the relative importance of shocks, that was the only policy conclusion that could be drawn, limiting the operational insights from the analysis.

While celebrated, the analysis was subject to a number of shortcomings. In line with the mainstream models at the time, it overlooked the role of expectations, as well as the eventual adjustment of prices in the medium run. Another limitation is the lack of micro foundations for the underlying aggregate demand and money demand relationships, as stressed by Obstfeld and Rogoff (1996, p. 632).

2.2 Modelling now: Uses and limits of the exchange rate

The ultimate goal of monetary policy

The limitations outlined above have led to the development of 'dynamic stochastic general equilibrium' (DSGE) models in macroeconomics. These models cast the analysis in a framework that explicitly accounts for the dynamic response to shocks at various horizons. This shift also occurred in open-economy macroeconomics, with Obstfeld and Rogoff (1996, ch. 10; 2001) presenting a tractable version of these models. The framework includes three main ingredients that were lacking in earlier

³ A similar analysis can be conducted for the case of external shocks which, in the interest of brevity, we omit here.

analysis. First, the general equilibrium model is based on explicitly optimizing behaviour by consumers, workers and firms. Second, the model provides a well-grounded metric for evaluating alternative policies, in the form of the welfare criterion that agents maximize. Third, while the assumption of sticky prices remains at the core of the analysis – otherwise monetary policy has no impact on real economic activity – firms set prices in a forward-looking fashion, taking full account of the various possible shocks and the rule under which monetary policy is conducted.⁴

A contribution by such DSGE models is to clarify the nature of the problem facing central banks, both in the short and the long run. In the long run the role of monetary policy is to provide a stable nominal anchor. This prescription was already apparent in the 1970s and 1980s when several central banks opted for a stable expansion of some monetary aggregate. While this monetary targeting strategy broke down because of instability of the link between monetary aggregates and inflation, the prescription for a stable anchor remains at the core of more recent strategies such as inflation targeting.

While monetary policy should smooth economic fluctuations in the short-run, DSGE models stress that this stabilization should be understood in terms of movements around an efficient benchmark. Earlier contributions assumed that the central bank aimed at stabilizing the level of output, with steady growth being the optimal allocation. By contrast, the recent literature shows that the ultimate goal of monetary policy is to bring the economy around the obstacle of price rigidities. If prices and wages could be adjusted immediately to shocks, the economy would respond to

⁴ Modern DSGE models nonetheless retain some ad-hoc aspects, mostly for tractability reasons. For instance they consider time-dependent pricing rules for price setters, while state-dependent rules have more appealing features.

these shocks in an efficient way. For instance, a slowdown in productivity would lead to a reduction in output. While at first such a recession could appear suboptimal, it is indeed the best possible response to the fact that producing output has become more costly.⁵ The failure of prices and wages to adjust is then costly as it prevents the economy from reacting in an efficient way to shocks. Because of their ability to affect economic activity in the presence of nominal rigidities, central banks have a role to play in alleviating this problem. The best they can achieve is to generate a response of economic variables identical to the one that would be achieved under flexible prices.⁶ Stabilization policy is then interpreted in terms of gaps from the flexible price allocation. As the efficient allocation can entail substantial fluctuations in response to shocks, the policy prescription is for a stabilization in relative terms – that is, around the flexible price allocation – and not necessarily in absolute terms.

Exchange rate and relative prices

One of the most prominent distinctions between closed and open-economy macroeconomics is the central role of relative prices in the latter. In the context of the analysis of monetary policy, this puts the efficiency – or lack thereof – of international relative prices at the center stage. Consider for instance a productivity improvement in a country. If prices are free to adjust, the price of the goods produced in that country fall, making them cheaper than goods produced in other countries.

In the presence of price rigidities, a central question is whether monetary policy can generate these efficient responses in international relative prices. Specifically, the

⁵ While policies aimed at raising the structural growth rate of productivity are clearly desirable, they are distinct from monetary policy.

⁶ Corsetti and Pesenti (2005) present a highly tractable description of these points.

analysis stresses the central role of exchange rate pass-through, that is the extent to which movements in exchange rates affect the price that consumers pay for imported goods.

The literature first considered the case where import prices move one-for-one with the exchange rate, so that a 10 percent depreciation of a country's currency leads import prices in that country to increase by 10 percent. Movements in the exchange rate then affect the relative price of goods produced in different countries, a benefit stressed by Friedman (1953). Consider for instance a 10 percent depreciation of the dollar vis-à-vis the euro. European consumers see a 10 percent reduction in the price of U.S. goods, with no change in the price they pay for European goods. Similarly, U.S. consumers face a higher dollar price of European goods, with no change in the price of U.S. goods. In both countries the depreciation of the dollar then reduces the price of U.S. goods *relative* to European goods.

In the presence of a connection between the exchange rate and relative good prices, monetary policy should not limit exchange rate fluctuations as they are useful in delivering efficient movements in the terms-of-trade – the relative price of traded goods produced in different countries – (Obstfeld and Rogoff 2001). Consider a situation where productivity increases in the United States. If prices were flexible, the higher productivity reduces the price of U.S. goods, which are easier to produce. This affects both the level and the composition of world demand. In terms of the level, the low price of U.S. goods reduces the consumer price index in both the U.S. and Europe, leading to higher real balances and higher demand. In terms of the composition of demand, the fall in the relative price of U.S. goods induces consumers worldwide to shift their demand away from European goods towards U.S. goods. Such a shift is efficient as U.S. goods are less costly to produce.

In the presence of price rigidities, this adjustment mechanism is not operative. Monetary policy can however generate an efficient response. Specifically, the improvement of U.S. productivity should be accompanied by an expansionary

monetary policy in the U.S., leading to a depreciation of the dollar. This policy response affects the composition and level of demand in the same way as price adjustments would have. In terms of the composition, the depreciation of the dollar reduces the relative price of U.S. goods worldwide, leading consumers to shift from European to U.S. goods. In terms of the level of demand, the increase in U.S. nominal balances is transmitted to real balances. This transmission is partial as the weak dollar raises import prices, hence the U.S. overall price index, and the level of demand in the U.S. increases by less than the monetary expansion. The depreciation of the dollar also affects the level of European consumption, as European consumers now benefit from cheaper imports, leading to a reduction in the European consumer price index, hence an increase in real balances and demand. Overall, the combination of an expansionary monetary policy in the U.S. and a flexible exchange rate brings the economy to the *exactly* same allocation that would prevail with flexibility, which is the best that central banks can aim for.

The above argument hinges on the ability of exchange rate movements to alter import prices. The empirical evidence however finds that the price paid by consumers for imported goods is little affected by exchange rate fluctuations, calling the relevance of the analysis above into question. The exchange rate indeed loses its usefulness when the price paid by consumers for imported goods is not affected by exchange rate movements (Devereux and Engel 2007). While monetary policy still has a role to play, this is now limited to the level of demand. Consider again the case of a productivity gain in the U.S. discussed above. With Europe and the U.S. being of similar size, demand would increase equally in both countries when prices are flexible. With sticky prices, this pattern can be achieved through expansionary monetary policy in both countries, boosting demand through higher nominal and

real balances.⁷ The best monetary policy can do is then to boost demand equally in the two countries through similar expansions. The policy response does not deliver the flexible price allocation, as it only affects the level of demand, but not its composition across U.S. and European goods. As monetary policy moves in step in both countries, the exchange rate remains unchanged, an aspect that entails no cost as the exchange rate has no impact on relative prices. To put things succinctly, the prescription can be summarized as “if the exchange rate is powerless, don’t use it”.

In light of the overwhelming evidence that consumer prices are little affected by exchange rate movements, one could expect the analysis outlined above to have sounded the death knell of flexible exchange rates. This is however not the case. A first reason is that consumer prices may not be the relevant prices for the allocation of aggregate demand across goods produced in different countries. Consumer prices are only the ultimate stage of a long distribution chain that goes from the foreign producers through domestic importers, and retailers. The evidence shows that exchange rate movements are transmitted to prices at the intermediate stages of this chain much more than to consumer prices, and movements in exchange rate can then alter the composition of demand by inducing intermediaries to substitute between domestic and imported inputs.

Terms-of-trade vs. real exchange rate

Another limitation of the analysis above is that it focuses on the terms-of-trade. This measure compares the relative price of goods produced in different countries that can be shipped across borders, such as manufactured goods. It however abstracts from the price of other goods that cannot be shipped, such as services that can only be consumed where they are produced (a haircut being the standard example).

⁷ As consumer prices are fixed for both domestic and imported goods, nominal and real balances move in step.

Because services account for the bulk of consumption baskets in many countries, the terms-of-trade offers only a partial picture. In particular they do not allow for international comparisons of the overall level of consumer prices, including both traded goods and services. Such a comparison relies on another measure of international relative prices, namely the real exchange rate – the ratio between the U.S. consumer price index and the European consumer price index. Thus, a change in the price of services in the U.S. alters the U.S-Europe real exchange rate, even though the terms-of-trade are unchanged. As a result, movements in the nominal exchange rate can play a role through the real exchange rate even when they do not affect the terms-of-trade (Corsetti 2007, Duarte and Obstfeld 2007).

We illustrate this by considering again a productivity improvement in the United States. In our discussion so far we assumed that the consumption baskets of U.S. and European consumers are similar, in which case the productivity gain leads to an equal increase in the level of demand in both countries when prices are flexible. In reality, however, the consumption basket in a country is tilted towards domestic goods, through the presence of non-traded goods such as services for instance. U.S. goods then account for the bulk of the U.S. consumption basket, while playing a limited role in the European basket. In this case, a productivity improvement in the U.S. leads to a larger increase in the level of demand in the U.S. than in Europe when prices are flexible, as the now cheaper U.S. goods are most prominent in the U.S. basket.

What happens when prices are sticky? Assume that import prices are insulated from the exchange rate, so that exchange rate movements have not impact on the terms-of-trade. As discussed above, monetary policy only affects the level of demand, and not its allocation across different goods. Even though monetary policy cannot work through the terms-of-trade, the optimal policy calls for a larger expansion in the U.S. than in Europe. This policy mix leads to a larger consumption increase in the U.S., as in the case where prices are flexible. The different reaction of monetary policy across

the two countries entails a depreciation of the dollar. Therefore, pegging the exchange rate would be suboptimal, even though it has no impact on consumer prices.

The prescription for a flexible exchange rate even when it has no impact on relative prices can appear surprising. However, the optimal policy does not call for moving the exchange rate because it alters import prices. Instead, it indicates that policy makers should not limit their flexibility by stabilizing a variable that is substantially disconnected from real activity. The prescription can be summarized as “if the exchange rate is powerless, don’t restrict policy because of it”.

Additional extensions

DSGE models also shed light on a range of other questions. First, some currencies occupy a prominent role in international trade and financial markets that goes beyond the size of the country, and Alexander contributed to the analysis of this issue in the context of financial markets (Swoboda 1968, 1969). Recent work using DSGE models shows the asymmetric impact of monetary policy in different countries when one currency is the dominant invoicing vehicle of international trade (Goldberg and Tille 2008). Second, the international spillovers of policy have fed a debate on whether some form of international cooperation between central banks is warranted. The recent literature shows that international spillovers per se do not warrant cooperation. The relevant criterion is instead whether the marginal impact of a country’s monetary stance differs between its own residents and foreign consumers. Such a difference does not emerge in general, with notable exceptions such as the case asymmetric shocks between the traded and non-traded sectors (Canzoneri et al. 2005).

The contributions discussed above focus on the ability of the exchange rate to affect the allocation of world demand across goods produced in different countries, the so-called intensive margin of external adjustment. This is however not the only dimension of external linkages, and researchers have stressed the role of the

extensive margin (Corsetti, Pesenti and Martin 2008). Under this alternative channel, a country can boost the value of its exports by extending the range of goods it produces. While increasing sales of existing varieties of goods abroad requires a movement in their relative prices, hence a potential role for the exchange rate, selling new goods does not necessarily entail such a reduction in prices.

Although the issue of monetary policy design in an open economy is an ongoing area of work, the recent literature points to the desirability of an inward-looking policy. Specifically, monetary policy is best conducted by aiming at domestic conditions, letting the exchange rate to freely adjust. This prescription allows for monetary conditions to be in line with the specific conditions of various countries. It can also be understood as a particular application of the general result that monetary policy should focus on stabilizing fluctuations in prices whose adjustment is the most restricted,⁸ and let prices that are more flexible, such as the exchange rate, move freely.

3. Exchange rate regimes in practice

While the literature reviewed above has improved our understanding of the appropriate design of monetary policy in open economies, both the earlier and more recent models discussed above face substantial limitations. First, they focus squarely on the short-run stabilization problem faced by a central bank. The analysis is conducted assuming that the central bank is perfectly credible and faces no constraints from fiscal policy or the stability of the financial system. Long run inflation expectations are well anchored, and the only problem for the central bank is

⁸ The ability of monetary policy to bring the economy to the flexible price allocation in some settings can be understood as removing the need for a costly adjustment in prices. If monetary conditions are such that price setters would choose not to adjust their price, if they could change it, then price rigidities cease to be an effective constraint.

to choose the exact form of the policy rule through which it exerts its influence. Few central banks are as fortunate in the real world.

Furthermore, while the theoretical literature provides plenty of insight into the considerations that should go into the choice of exchange rate regime, it is not straightforward to operationalize them since of the structure of economy and the nature of shocks are in practice not known.⁹

Overall, it is therefore not surprising that many countries operate monetary policy with an exchange rate arrangement that seems difficult to reconcile with economic theory. This suggests that the models discussed above disregards some factors that play an important role when countries chose exchange rate regime. We review these factors below.

3.1 The exchange rate as a nominal anchor

The models discussed in Section 2 are silent on how inflation expectations are anchored. This abstracts from the common use of a fixed exchange rate as a nominal anchor. This role has been especially prominent in many schemes to stop episodes of high or extreme inflation.¹⁰ With prices being changed daily or weekly, price indices that are reported monthly cease to provide any information about current developments. Instead, many prices are tied informally or formally to the exchange rate which can be observed in real time. Pegging the exchange rate, even temporarily, then becomes an effective way of slowing inflation. While the adoption of a peg thus seems a simple and effective way to bring inflation under control, it does not remove the need to address the fiscal problem that is typically the root cause of high

⁹ Moreover, since the literature has evolved over time and may continue to do so, policy makers may have hesitated to rely on it in choosing exchange rate regime.

¹⁰ Dornbusch (1985) discusses the key role in stopping episodes of extreme inflation, focusing on the German hyperinflation in 1923.

inflation. That said, pegging the exchange can improve the government's fiscal position by raising the real value of tax collections and provides some breathing room during which fiscal reforms can be implemented to bring durably the budget deficit under control.

In addition to having played an important role in ending occasional episodes of extreme inflation, exchange rate pegs have proved useful in disinflation packages in many emerging market and transition countries.¹¹ Furthermore, fixing the exchange rate to the currency of a low-inflation neighbour has been seen as a tool to achieve and maintain low inflation by a range of central banks, particularly in Europe, with a history of moderate inflation but poor credibility. Thus, many countries adopted fixed exchange rate pegs against the DM or the ECU in order to reduce inflation on a sustained basis (Giavazzi and Giovannini 1989). While this policy was successful in those countries (e.g. Austria and the Netherlands) that were willing to subordinate monetary policy fully to the maintenance of the peg, many other countries experienced repeated episodes of speculative attacks, typically involving large and sustained increases in short-term interest rates to the detriment of economic activity, often ending in a devaluation. One lesson to be drawn from these episodes is that sustaining a fixed exchange rate under capital mobility requires monetary policy be completely focused on to the exchange rate goal.

However, while a peg can serve as a nominal anchor, it has become increasingly recognised in recent years that fixing the nominal exchange rate against a stable currency does not guarantee a low and stable inflation if equilibrium real exchange rates change over time, due to the Balassa-Samuelson effect or because of shocks. An appreciation of the real exchange rate can take place through high domestic inflation,

¹¹ Mussa et al. (2000, Appendix III) reviews the lessons from a number of exchange-rate-based stabilization programs in the 1980s and 90s.

which is a costly process, or a nominal appreciation, which can be changed more easily.

Under a nominal peg, the country is left only with the first option. Gerlach and Gerlach-Kristen (2006) study the behaviour of inflation in Hong Kong and Singapore, whose economies are quite similar but who has different monetary policy regimes. They find that inflation is both higher and more volatile in Hong Kong, which has successfully maintain a peg to the US dollar for since 1983 through a currency board arrangement, than in Singapore where the exchange rate is managed. Similarly, a number of East European countries that maintain fixed exchange rates against the euro are also experiencing high inflation for much the same reason. This suggests that idiosyncratic shocks that affect equilibrium exchange real rates are difficult to deal with under a pegged exchange rate and provide a reason for adopting floating exchange rates.

Overall, it seems that while fixed exchange rates can be a useful nominal anchor when attempting to stabilize the economy in cases of rapid and volatile inflation, it appears to be a less effective tool to maintain low and stable inflation. Instead, many central banks have in the last two decades adopted a floating exchange rate, coupled with an explicit numerical objective for inflation, for instance by introducing inflation targeting, in order to do so.

3.2 Financial integration and resilience

Another factor insufficiently emphasised in the theoretical literature reviewed above is the consequences of the large increase in capital mobility in recent years (Shambaugh and al. 2004, Lane and Milesi-Ferretti 2007), which have made it almost impossible to sustain inconsistent policies. While the theoretical models assume that central banks under fixed exchange rates are willing to devote policy fully to the need to sustain the exchange rate, in practice central banks can not completely disregard other objectives, in particular for economic activity. As a consequence,

speculative pressures against a fixed exchange rate are almost impossible to avoid: all that is needed is a deep recession for market participants to conclude that maintaining the exchange rate may not be such a good policy, despite the authorities' protestations to the contrary.

But even if the central bank is willing to gear monetary policy fully to maintaining the demands of the fixed exchange rate, shocks can occur and lead markets to doubt policy makers' commitment to the peg. In conditions of perfect capital mobility, this can lead to high and volatile interest rates as the central bank seeks to defend the peg. The degree of sophistication and resilience of the financial sector is then a central dimension (Mussa et al. 2000). An essential precondition for a fixed exchange rate regime to function well is consequently that the financial system and corporate borrowers are able to endure such episodes of high interest rates. Pegging the exchange rate is thus most likely to be successful in economies with a resilient financial system, but, of course, such countries tend to be in a good position to conduct monetary policy with a floating exchange rate.

By contrast, in many developing countries with a limited involvement in the global financial system, the central bank does not run the risk of being overwhelmed by in and outflows. Conducting monetary policy with fixed rates is in these cases possible and has many readily apparent attractions. In particular, it is an easy and transparent strategy policy and is not particularly demanding from the perspective of policy formulation.

Overall, the facts that multiple objectives for monetary policy are almost unavoidable and that few financial systems can endure a protracted episode in which the central bank uses interest rates to sustain the peg play an important role in countries' choices of exchange rate regime in practice.

3.3 Institutions

A third factor disregarded from the theoretical models is the “quality” of institutions, which Alesina and Wagner (2005) argue has a critically influence in countries exchange rate choice.¹² Weak institutions make it difficult to defend a exchange rate peg and often lead to poor and inconsistent macroeconomic policies which puts the peg under pressure.

It is easy to see how weak institutions can make a peg difficult to maintain in practice. As already noted if banks’ balance sheets are weak – because of ineffective supervision, uneven risk control, politically influenced lending or any of a range of other reasons – or if their borrowers’ balance sheets are weak, the central bank’s ability to raise interest rates to defend the peg may be limited. Indeed, a fixed exchange rate could actually exacerbate such problems by leading to high levels of borrowing in foreign currency under the mistaken assumption that the exchange rate will always be maintained. Weak institutions can also lead to large fiscal deficits and the government’s financial position to become precarious. If so, speculators may similarly come to doubt the central bank’s willingness or ability to raise interest rates sufficiently to fend off an attack on the pegged exchange rate.

Furthermore, weak institutions may lead to political interference in monetary policy, either directly through political control of the central bank or through the adoption of multiple policy objectives that may conflict with the fixed exchange rate. The exchange rate peg may therefore lack credibility and can become the target of speculation.¹³

¹² The central role of institutions is also stressed by Calvo and Mishkin (2003). See also the discussion in Genberg and Swoboda (2005).

¹³ See Obstfeld and Rogoff (1995, section 9.5.4) for an analysis.

Alesina and Wagner (2005) therefore argue that countries with very weak institutions do not to adopt fixed exchange rate regimes but instead let the exchange rate float freely, and produce econometric work that that supports this hypothesis.

However, while floating rates are common among countries with weak institutions that make it difficult for them to maintain an exchange rate peg, conducting monetary policy under floating exchange rates also puts stringent demands on a country's institutions. Thus, many central banks operating under floating exchange rates have adopted price stability, frequently using an inflation target, as the overriding objective of monetary policy. For this to function well, the central bank must enjoy instrument independence. In turn, this requires that fiscal policy and therefore fiscal institutions are strong enough so that fiscal dominance over monetary policy can be avoided. The central bank must also have the capacity to analyze and forecast inflation, and must have made considerable progress in establishing its credibility since otherwise shocks to inflation can have large effects on inflation expectations and complicate the management of monetary policy.¹⁴

But for many countries that are unable to pursue policy with a floating exchange rate and a commitment to price stability, yet have enough institutional capacity to conduct purposeful monetary policy, a pegged exchange rate offers an effective mechanism to ensure predictable monetary environment. Thus, as argued by Alesina and Wagner (2005), many countries with an intermediate level of institutional capacity, a preference for fixed exchange rates.

¹⁴ Interestingly, this framework does not necessarily permit the central bank to disregard the exchange rate in conducting policy. For instance, if liquidity in the foreign exchange market is thin because the economy is small or dominated by a few institutions, the central bank may be required to remain an activity participant.

3.6 Changing exchange rate regimes

Above we have explored a set of reasons for why countries may not operate with type of exchange rate regime suggested by theory. Another reason for this is simply that while economic conditions have changed since the country last rethought its exchange rate strategy, the exchange rate regime has not. Any switch in strategy involves a great deal uncertainty, particularly if it is undertaken in response to market pressures. Since there may be difficult to generate political support for a change in regime in good times, and it may be perceived as too risky to do so when economic conditions are weak, policy makers are naturally hesitant to change regimes unless strictly necessary. Consequently, it seems plausible that quite a few countries operate with a policy regime that has outlived its optimality.

This aspect is illustrated by Gerlach (1999) who studies a sample of 22 developed economies, seeking to determine what structural features make an economy likely to adopt floating exchange rates and inflation targeting. Initially, he finds little pattern to countries' preferences for inflation targeting, but further inspection shows that this finding depends on the inclusion of Iceland and Norway, which both targeted the exchange rate, in the sample. Dropping them, the probit estimates show that countries with inflation targets tend to export a narrow range of goods, largely commodities, and thus are subject to large shocks to equilibrium real exchange rates. As both Iceland and Norway are examples of such small open economies, one would have expected them to also operate with an inflation target and a flexible exchange rate. Thus, either the model misses some important feature of exchange rate choice or these two countries operate with a suboptimal exchange rate arrangement. We lean towards the second interpretation, as both countries subsequently introduced inflation targeting and dropped the intermediate exchange rate objective.

4. The exchange rate regime in practice: a case study of Hong Kong

Next we discuss the various elements outlined above in the case of Hong Kong, which is conducting monetary policy under a currency board arrangement since the early 1980s. Given the fact that Hong Kong is a major financial centre with a large and sophisticated economy, its choice of a fixed exchange regime may appear unusual.

4.1 The introduction of the currency board

To understand the motivations that have led the authorities to maintain the currency board, it is essential to review its recent monetary history. Hong Kong operated under a silver standard from 1845 to 1935 when it adopted a sterling peg supported by a currency board arrangement. After having let the exchange rate float in the early 1970s, Hong Kong reintroduced a fixed exchange rate in October 1983, when the Hong Kong dollar (HKD) was pegged to the US dollar (USD) at 7.8 HKD/USD.¹⁵ One reason for the introduction of the linked exchange rate system was the 20% depreciation of the currency between June 1982 and June 1983. However, the exchange rate continued to depreciate sharply and in October the then two note-issuing banks, the Hongkong and Shanghai Banking Corporation (HSBC) and the Standard Chartered Bank, were required to back the note issue by depositing an equivalent amount in US dollars at the conversion rate of 7.8 HKD/USD, with the government's Exchange Fund. This reintroduced the currency board which is still in force with at unchanged rate of 7.8 HKD/USD.

Two factors led to the change in regime. Most obviously, the exchange rate collapse in the summer of 1983, which resulted from China's announcement that it intended to regain sovereignty over Hong Kong in 1997. From a macroeconomic perspective, it is difficult to see why this announcement would lead to large depreciation of the

¹⁵ See Jao (1990) for discussion of the events that lead to the adoption of the currency board.

currency unless one believed that monetary policy would turn massively inflationary a decade and half later. A more plausible interpretation is that the depreciation reflected increased risk perceptions. Gerlach and Smets (2000) demonstrate that central banks should stabilise the exchange rate in response to such exchange rate shocks if they leave the equilibrium real exchange rate unaffected.

The second factor underlying the regime change was Hong Kong's poor inflationary experiences following the abandonment of the sterling peg in 1972, which more importantly had entailed the abandonment of currency board principles.¹⁶ Instead, a USD dollar peg was introduced, which lasted until November 1974 when the HKD was free to float. Without a central bank, Hong Kong was left without effective monetary control. While HSBC determined the level of HKD liquidity in the interbank bank market (since banks settled over its books), it could not function as a fully-fledged central bank since it could not take the financial risk associated with trading against the rest of the market. Moreover, any foreign exchange intervention by the Exchange Fund would be sterilised as the HSBC recycled the funds into the market. In terms of the Poole analysis, Hong Kong experienced large fluctuations in the LM curve.

Overall, with a combination of large credibility shocks, which were likely to gain in importance as the handover approached, and LM shocks, economic theory suggests that fixing the exchange rate was appropriate. Moreover, a change to a managed float was not possible because of institutional factors, that is, the absence of a central bank that could conduct monetary policy. While the first-best policy might suggest that a central bank should have been established, Latter (2004) argues that given the tradition of a small government, it would have been difficult to muster the necessary

¹⁶ See Latter (2004) for a discussion of the adoption of the currency board in 1983.

political support to establish one. Overall, it is not difficult to understand why the currency board was re-established in 1983.

4.2 Options for the future

Twenty five years later, the currency board remains intact. This is an extraordinary achievement, in light of the many large shocks experienced, in particular the Asian financial crisis. However, the factors that led to reintroduction of the currency board in 1983 have arguably largely disappeared: the handover passed smoothly, Hong Kong's economic regime remains unchanged, China has not been a source of shocks, and the size of capital flows that can be brought to bear on the peg has increased massively. Furthermore, the institutional environment has been transformed with the creation of the Hong Kong Monetary Authority (HKMA) in 1993 and a number of subsequent reforms which would enable the HKMA to manage interbank liquidity and which have enhanced the financial infrastructure, strengthened the banking system, and increased the HKMA's capacity to analyse economic developments.¹⁷ As noted by Latter (2004), the HKMA is now in a position to implement other monetary policy strategies if so decided by the government, which is responsible for the choice of exchange rate arrangement.

So why does the currency board remain? Three factors would appear to play a role. First, it is widely seen as having worked well and enjoys broad support. The political authorities presumably see no need to change it when economic conditions are good, and the risks associated with doing so may loom large when conditions are less benign. Second, while the HKMA enjoys instrument independence, a change in monetary strategy would require further buttressing of the independence of the

¹⁷ Of course, these reform has also strengthened the ability of the currency board to withstand speculative pressures.

HKMA and other institutional changes. In an economy in which keeping government small is a widely shared objective, mustering political support for such a change is not easy. Third, the Basic Law governing Hong Kong states that the HKD shall remain legal tender during a 50 year transition period after which the renminbi presumably will be sole legal tender. Long before then, market forces may have lead to widespread use of renminbi in Hong Kong. Given this outlook, there is understandably little point in going through the practical complexity of establishing a new policy regime that would necessarily be temporary.

5. Conclusions

In this paper we have considered the design of monetary policy in an open economy, focusing on the uses and limitations of flexible exchange rates. We first reviewed how the theoretical literature has developed over the last thirty years, with the initial emphasis on the nature of shocks followed by an emphasis on the (in)ability of the exchange rate to assist monetary authorities in moving the economy in line with an efficient allocation.

We next considered several dimensions that, while highly relevant in practice, were substantially set aside in the literature. These includes the use of an exchange rate peg as a nominal anchor when the central bank enjoys a limited credibility, the role of financial integration, institutions, and the fact that policy makers appear hesitant to change regimes even if they are no longer optimal. We illustrated these aspects through a small case study of Hong Kong.

Overall we draw two broad conclusions from our analysis. First, when central banks have established their inflation-fighting credentials, the optimal policy regime is targeted at domestic conditions, letting the exchange rate to adjust. The main benefit of such a strategy is to allow central banks to fine-tune their reaction to asymmetric conditions in different countries. While keeping an eye on exchange rate development is warranted, as the exchange rate adjusts promptly to changing

economic conditions and thus conveys useful information to policy makers, conditioning monetary policy narrowly on the exchange rate imposes too much of a straightjacket.

Second, the usefulness of a peg when central banks have yet to establish credibility should not be overstated. A central, and in our view debatable, assumption underlying the peg-as-a-nominal-anchor view is that while the central bank is unable to commit to price stability on its own, it can commit to maintaining a peg. In practice, maintaining a peg can impose a substantial cost either in the form of foreign exchange reserve losses, or a tightening of policy that is unacceptably high from the point of view of domestic conditions. The turbulences of the European Monetary System in 1992, and the collapse of Argentina currency board in 2001 are just two of many examples of exchange rate peg proving too costly.

The several instances of fixed exchange rate breaking down highlight that a peg is not a cure-all policy recipe, and at most buys a country some time in implementing reforms to address limitations in the fiscal or financial environment. Whether to peg or to float is a relatively secondary policy choice, compared to putting fiscal policy on a sustainable path, or establishing a sound financial system, as stressed by Calvo and Mishkin (2003).

References

- Alesina, Alberto and Alexander F. Wagner (2005), "Choosing (and renegeing on) exchange rate regimes," Harvard University.
- Alexander, Lewis (1997), "Notes on the Poole Model and MCIs," unpublished memo.
- Boyer, Russell S. (1978), "Optimal Foreign Exchange Market Intervention," *Journal of Political Economy*, 86, 1045-1055.
- Calvo, Guillermo, and Frederick Mishkin (2003), "The Mirage of Exchange Rate Regimes for Emerging Markets Countries," *Journal of Economic Perspectives* 17(4), 99-118.
- Canzoneri, Matthew, Robert Cumby and Behzad Diba (2005), "The Need for International Policy Coordination: What's Old, What's New, What's Yet to Come," *Journal of International Economics*, 66, Issue 2, 363-384.
- The Conference Board (2005), "Do Exchange Rates Matter? A Global Survey of CEOs and CFOs on Exchange Rates" written in cooperation with the Group of Thirty. The Conference Board Research Report R-1349-04-RR.
- Corsetti, Giancarlo (2007), "A Modern Reconsideration of the Theory of Optimum Currency Areas," prepared for the ECFIN Conference EMU@10, in Brussels, Revision February 2008.
- Corsetti, Giancarlo, and Paolo Pesenti (2005), "The Simple Geometry of Transmission and Stabilization in Closed and Open Economies," mimeo, Federal Reserve Bank of New York.
- Corsetti, Giancarlo, Paolo Pesenti and Philippe Martin (2008), "Productivity, Terms of Trade and the 'Home Market Effect'," *Journal of International Economics*, forthcoming.
- Devereux, Michael, and Charles Engel (2007), "Expenditure Switching vs. Real Exchange Rate Stabilization: Competing Objectives for Exchange Rate Policy," *Journal of Monetary Economics* 54, 2346-2374.
- Dornbusch, Rudiger (1985), "Stopping hyperinflation: Lessons for the German inflation experience of the 1920s," NBER Working Paper Series No. 1675.
- Duarte, Margarida and Maurice Obstfeld (2007), "Monetary Policy in the Open Economy Revisited: The Case for Exchange-Rate Flexibility Restored".
- Friedman, Milton (1953), "The Case for Flexible Exchange Rates," reprinted in *Essays in Positive Economics*, Chicago, IL: University of Chicago Press, 157-203.
- Genberg, Hans and Alexander Swoboda (2005), "Exchange-Rate Regimes: Does What Countries Say Matter," *IMF Staff Papers*, 52, 129-141.
- Gerlach, Stefan (1995), "Adjustable Pegs vs. Single Currencies: How Valuable is the Option to Realign?" *European Economic Review* 39, 1155-1170.

Gerlach, Stefan (1999), "Who targets inflation explicitly?" *European Economic Review* 43, 1257- 1277.

Gerlach, Stefan and Petra Gerlach-Kristen (2006), "Monetary policy regimes and macroeconomic outcomes: Hong Kong and Singapore." In: Monetary Policy in Asia: Approaches and Implementation, BIS Papers No. 31.

Gerlach, Stefan and Frank Smets (2000), "MCIs and Monetary Policy," *European Economic Review*, 44, 1677-1700.

Giavazzi, Francesco and Alberto Giovannini (1989), Limiting Exchange Rate Flexibility: The European Monetary System, MIT Press, Cambridge, MA.

Goldberg, Linda, and Cédric Tille (2008). "Macroeconomic Interdependence and the International Role of the Dollar," CEPR Discussion Paper 6704.

Jao, Y. C. (1990). From Sterling Exchange Standard to Dollar Exchange Standard: The Evolution of Hong Kong's Contemporary Monetary System 1967–1989. In Jao, Y. C. and Frank H. H. King, Money in Hong Kong: Historical perspective and contemporary analysis. Centre for Asian Studies, University of Hong Kong.

Lane, Philip, and Gian Maria Milesi-Ferretti (2007). "A global perspective on external positions," in R. Clarida ed., G7 Current Account Imbalances: Sustainability and Adjustment, University of Chicago Press.

Latter, Tony (2004), "Hong Kong's Exchange Rate Regimes in the Twentieth Century: The Story of Three Regime Changes," HKIMR Working Paper No. 17/2004.

Mundell, Robert (1968), International Economics, New York: Macmillan.

Mussa, Michael, Paul Masson, Alexander Swoboda, Esteban Jadresic, Paulo Mauro, and Andy Berg (2000), Exchange-Rate Regimes in an Increasingly Integrated World Economy, IMF Occasional Paper No. 193.

Obstfeld, Maurice, and Kenneth Rogoff (1996), Foundations of International Macroeconomics, Princeton University Press.

Obstfeld, Maurice, and Kenneth Rogoff (2001), Global Implications of Self-Oriented National Monetary Rules, mimeo, University of California, Berkeley.

Poole, William (1970), "Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model," *Quarterly Journal of Economics*, 84, 197-216.

Shambaugh, Jay, Maurice Obstfeld and Alan Taylor (2004), "The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility."

Swoboda, Alexander (1969). "Vehicle Currencies and the Foreign Exchange Market: the Case of the Dollar", in Robert Z. Aliber, ed., The International Market for Foreign Exchange, Praeger Special Studies in International Economics and Development, Frederick A. Praeger, Publishers, New York.

Swoboda, Alexander (1968). "The Euro-Dollar Market: An Interpretation", *Essays in*

International Finance 64, International Finance Section, Princeton University.