

ABSTRACT**Exchange Rates and Macroeconomic Policy with Income-sensitive Capital Flows**

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This paper considers some implications for macroeconomic policy in an open economy if – as appears highly probable – international flows of capital are now significantly sensitive to changes in income, and to expected changes in income, in different countries. This assumption is in contrast to that in accepted analysis where international capital flows are sensitive only to relative interest rates in different countries. One conclusion is that the effects on the exchange rate (or on the reserves in a fixed-exchange rate system) of monetary policy in an open economy will be less than if it is assumed that capital flows react only to changes in interest rates. The effects of fiscal policy changes upon the exchange rate (or the reserves if the exchange rate is fixed) will also be more likely to be largely or fully offset by capital flows than if relative interest rates alone affected the flow of capital. It will, however, remain true that so long as capital flows react also to some extent to relative interest rates, monetary policy retains a comparative advantage over fiscal policy in affecting the exchange rate, or the level of reserves in a fixed exchange rate system. It is also concluded that if capital flows react to changing levels of income, a shift from fixed to flexible exchange rates will have less effect in increasing the domestic effects of changes in monetary policy; and will be less likely to increase the domestic effect of changes in fiscal policy.

Exchange Rates and Macroeconomic Policy with Income-sensitive Capital Flows*

During the course of the year 2000 there were suggestions in the press that exchange rates were not responding in the usual way to changes in monetary policy by major central banks. In particular, a series of tightenings of monetary policy by the European Central Bank (the ECB) appeared to be followed by a weakening of the euro (relative to the US dollar), whereas orthodox analysis would have led one to expect that when a central bank tightens its monetary policy this would lead to an appreciation of that country's currency, by leading to additional net capital inflow. It was also suggested that the decision of the Federal Reserve Board *not* to tighten monetary policy in August 2000 – when there was some expectation in the market that policy would be tightened – may have led to a strengthening of the US dollar, rather than the reverse.

In each of these cases, the argument was that capital flows were responding mainly to the expected effect on earnings on equities of the monetary policies in question, rather than to the changes in interest-rate differentials. That is to say, when the ECB (for example) raised interest rates relative to those in the US, markets took the view that this was bad for activity and earnings in Europe, and so discouraged the flow of capital into European equities. Orthodox analysis, by contrast, would have led one to expect that capital flows to Europe would have been enhanced by the tightening of monetary policy,

*Comments and suggestions from Neville Norman and Peter Stemp on earlier drafts are gratefully acknowledged. Neither of these is responsible for remaining deficiencies.

with capital seeking the higher interest rates in Europe, and perhaps also by causing European borrowers to become readier to borrow in other countries, where interest rates had not risen.

If international capital flows are now sensitive mainly to expectations about future earnings, and perhaps relatively less so to fixed-interest differentials than in the past, this raises questions for policy, and also for the choice of the appropriate models for analysing macroeconomic policy in an open economy. The issues raised may be especially relevant for large countries – the US and the euro area, at least, and perhaps to some extent also for Japan.

But as the changes in the exchange rate of the euro against the US dollar may well have repercussions on the exchange rates of other countries, the issues raised are of much wider relevance. (The apparent tendency of currencies such as the Australian dollar to follow the euro downwards against the US during 2000 is an example of this.) More generally, policy-makers in other, small and medium-sized, countries need to consider whether the choice of the models on which they base their policy decisions needs to be amended in the light of the effects of earnings expectations upon international capital flows; or whether, on the other hand, this is a matter of relevance only for the major central banks of the US and Europe.

This paper discusses the implications for the choice of monetary and fiscal measures for affecting the exchange rate and other possible macroeconomic targets in an open economy. Consideration is given to possible distinctions between the relevant analysis

for very large central banks – the Fed and the ECB, and perhaps also Japan – on the one hand, and the situation of smaller countries, on the other.

Possible Modifications to Standard Approaches

The accepted analysis of macroeconomic policy in the open economy is on the basis of capital flows into and out of fixed-interest securities, with money as one asset (usually only money within the country whose policy is being considered) and ‘bonds’ (that is to say, fixed-interest rate assets), both domestic and external, as the only other assets.

Equities – including direct investment – are conspicuously absent from the analysis.

This omission could have been defensible if the demand for a country’s bonds and that for its equities could reasonably be assumed to move together – that is, if they are in some sense complementary to one another. This could also be true more generally if the principal factors affecting the attractiveness of bonds move closely in sympathy with those that affect the attractiveness of equities. Yet neither of these assumptions seems likely to be generally valid, and certainly not to be an accurate description of international capital markets today.

Alternatively, the standard assumption about the effects of capital flows responding to changes in fixed-interest rates could also be defensible if one could assume that the overwhelming majority of international capital flows are into and out of fixed-interest assets and liabilities, rather than into and out of equities. In the 1960s when the basic models (those of Fleming (1962) and Mundell (1963)) were first introduced, it may have been permissible to assume that fixed-interest assets were the dominant ones in international markets. But the rapid growth of international trading in equities, both

portfolio and direct investment, in recent years, may raise considerable doubts about whether such models are any longer appropriate without modification. Indeed, the question should be why they have persisted for so long to dominate the literature, including the basic texts, and the thinking of policy-makers, in a world where equity flows have become so important.

If a tightening of monetary policy leads investors to expect falling earnings on equity investments (whether portfolio or direct) in the country in question, they may naturally be expected to invest less in that country. On the other hand, the higher interest rates available there may still attract fixed-interest investors – and encourage fixed-interest borrowing from external sources by borrowers in the country where interest rates have risen. The question is which of these two influences on capital flows may be expected to predominate. In present-day conditions it seems likely that equity flows are now by far the more important type of capital flow, especially in the short run.

If so, a tightening of monetary policy by the ECB (for example) may be expected to lead to a weakening of the euro – rather than the strengthening that orthodox analysis would lead one to expect. At any rate, this is what one might expect to happen before trade flows have had time to be affected. When the tightening of monetary policy starts to reduce activity in Europe, however, the consequent reduction in imports, and possible stimulus to exports from Europe, could be expected to strengthen the euro. But even in the medium run, when imports start to fall, and perhaps also exports to rise, with falling activity in the euro area, one would not expect any strengthening of the euro to be as great as it would have been if international flows of capital into and out of fixed-interest assets had still been the dominant form.

The orthodox analysis argues that, with flexible exchange rates, the downward effects on activity of a tightening of monetary policy are enhanced by the appreciation that results when the higher interest rates lead to an increase in fixed-interest flows of capital to the country where monetary policy is tightened. But if equity flows are nowadays quantitatively the more important form of capital flow, this enhancement of the efficacy of changes in monetary policy (brought about by the consequent changes in the exchange rate) may not occur at all in the short run (before current account effects have been felt). Even in the longer run it will not be as great as one would have expected in the light of orthodox analysis relating to fixed-interest capital flows. Indeed, if (as seems to be certain) equity flows are now the predominant form, a tightening of monetary policy would lead (in the short run) to a depreciation as capital flows out, and the consequent depreciation would tend to reduce the extent to which a tightening of monetary policy reduced domestic activity.

This may not be of great importance in the US or in the euro area, where the channels of operation of monetary policy are predominantly internal, but they would be of considerable importance in smaller and medium-sized countries, where the channel of operation of monetary policy through the exchange rate has probably become of principal importance in recent years. We should therefore ask whether these considerations are likely to be important mainly in very large countries, or whether they have significance for other countries also.

Major countries compared with smaller countries

There is reason to think that the risk of income-sensitive capital flows dominating those through fixed-interest markets is greater for very large countries than for others.

For example, when the Fed raises interest rates it cannot reasonably assume that comparable interest rate rises will not occur in other countries. This means that its ability to increase US interest rates *relative to those elsewhere* is limited. The change in capital flows into fixed-interest securities in the US will thus be less important (relatively speaking) than for most other countries when they tighten their monetary policies. It is, however, also likely that the euro area is large enough and significant enough for a decision to raise interest rates in the euro area to be followed by some outside countries – at least those in Europe; and a similar argument may also be valid to some extent for Japan. Here again, therefore, the effects of monetary policy decisions upon fixed-interest flows may be expected to be of relatively less significance for major central banks than for the central banks of smaller countries. For flows into and out of equities are consequently more likely to predominate over those relating to fixed-interest rate assets for large countries – especially the US and the euro area. It might also be argued that Japan is of such significance for much of Asia that a substantial tightening of monetary policy there might lead neighbouring countries to raise interest rates, and thus to reduce the extent to which interest-sensitive capital flows towards Japan were increased by the tightening of monetary policy in Japan.

The central bank of a very large country or a group of countries may find that equity flows are also more significant *relative to* the effects of policy actions upon the current account than is true for smaller countries. For policy changes in the US (or in the euro

area, and perhaps Japan) have significant repercussions on activity in other countries, and so react back to a significant extent upon the country taking the initial actions. For example, if the US tightens monetary policy, this will tend to reduce incomes in the rest of the world, and so hold down the demand for US exports, whereas any such effect is not significant for smaller countries. This means that it is harder (proportionately) for the US to achieve a given strengthening of its current account or its exchange rate by tightening monetary (or fiscal) policy than it is for most other countries. Again, this increases the likelihood that flows of international capital into and out of equities are more significant (relatively) for major countries, compared with the orthodox effects – those through fixed-interest assets and the current account taken together – than for smaller countries. It should, however, be added that a tightening of policy in the US will lead eventually to repercussions upon the earnings on equities in the rest of the world, and to that extent tend eventually to reduce the outflow of equity capital from the US.

In the medium run, however, it remains likely that a tightening of monetary policy in the US will tend to strengthen the US dollar. For its effects on demand, at least in the medium or long run, and so on imports into the US, and perhaps still to some extent through encouraging fixed-interest flows of capital to the US, may well exceed any downward effects on equity capital flows into the US. Moreover, this may be true even if the effects on the current account, as well as those on fixed-interest capital flows, are less (relatively speaking) than for a smaller country. But the combined effects of the tightening of monetary policy in the US upon net capital flows and the current account are less likely to strengthen the exchange rate than if (as orthodox theory appears to assume) the effect on equity flows were insignificant. The tightening of monetary policy in the US is thus still likely to lead in the medium run to some appreciation of the dollar,

and that will tend to reduce the extent of any fall in the current account deficit of the US, and to reinforce the direct effects on activity in the US of the tightening of monetary policy.

Contrast the situation of the US with that of a smaller country, such as Australia. The Reserve Bank of Australia does not have to take account of the possibility of other countries – with the possible exception of New Zealand – following any rise of interest rates in Australia. It is therefore more likely to be able to increase the interest rates that it controls relative to the rest of the world than either the Fed or the ECB. Nor does the RBA normally need to assume that action on its part that reduces activity in Australia will reduce Australia's exports indirectly through the multiplier effects on the outside world – again, with the possible exception of effects on New Zealand. At the same time, it would be unwise to ignore the possibility of a tightening of monetary policy in Australia leading to a reduction in net capital flows, at least equity flows, into Australia. If so, the effect of the tightening of monetary policy in strengthening the exchange rate will be less than orthodox analysis would have led one to expect; and in the very short run it could even cause some depreciation.

The impact on equity flows to and from a small or medium-sized country may (as we have seen above) not be as significant (proportionately) as those through relative interest rates, compared with the US or the euro area. But even smaller countries must expect that there will be some tendency for equity flows to offset – partly or wholly – the effects of a change in monetary policy upon fixed-interest flows to and from the country in question. Moreover, for a smaller and more open economy, even a smaller effect on the exchange rate may be significant as the exchange rate is a much more important

channel for the operation of monetary policy than it is for larger and less open economies.

The optimal mix of fiscal and monetary policy

The standard analysis for a country with a flexible exchange rate and fairly mobile international capital flows is that a tightening of monetary policy is the preferred instrument for strengthening the exchange rate, or for improving the level of reserves in a fixed exchange rate system. This is because, for a given impact on the level of income and on the current account of that country, a change in monetary policy also affects net (fixed-interest) capital flows in the desired direction. (For example, a tightening of monetary policy is supposed to lead to additional net capital inflow, which strengthens the exchange rate and thus enhances the downward effect of the tightening of monetary policy upon domestic activity.) By contrast, the effects of a change in fiscal policy on the exchange rate (or on the reserves in a fixed-exchange rate system) through its effects on capital flows (in fixed-interest markets) tend to offset the effects through the impact of the fiscal changes in the level of income. (For example, a rise in taxation tends to reduce demand, and so interest rates, and that discourages fixed-interest capital inflow. The consequent depreciation tends to reduce the downward impact of the fiscal measure upon domestic demand.) If the aim is to strengthen the exchange rate (or raise the reserves), while exerting downward pressure on domestic activity, the preferred instrument will thus be monetary policy, while fiscal policy would be directed towards internal balance.

Now consider the case where the predominant form of capital flow is that into and out of equities. Both tighter monetary policy and a tighter fiscal policy now discourage capital

flows into equities in the country, and so tend to reduce net capital inflow if this is the predominant form. But provided that the impact on equity flows is similar for a given effect on domestic income, whether this comes from monetary or fiscal policy, this does not upset the general presumption that monetary policy has the comparative advantage over fiscal policy for achieving a given change in the exchange rate (or the level of the reserves in a fixed exchange rate system) – so long as there also remain some effects upon capital flows of changes in the level of interest rates in one country compared with the rest of the world. (If, however, that form of capital flows becomes insignificant, the comparative advantage of monetary policy from this point of view would disappear.)

But the other principal conclusion from the standard Mundell-Fleming analysis – that flexible exchange rates generally enhance the efficacy of monetary policy but generally not that of fiscal policy – appears to require some revision. A tighter monetary policy may now reduce net capital inflow (the effects on equity flows exceeding that upon fixed-interest flows). If so, when monetary policy is tightened, the exchange rate would tend to depreciate with flexible exchange rates, and that would weaken the deflationary effect of the tighter monetary policy. (With a fixed exchange rate, by contrast, the tendency for the reserves to fall would tend to increase the deflationary effect of the tightening of monetary policy.)

Furthermore, with highly mobile fixed-interest capital flows, under flexible exchange rates there is a risk that a monetary stimulus may be more or less fully offset by the outflow of capital from fixed-interest assets when interest rates are reduced through monetary policy. But the presumption of a downward effect upon total capital inflow of a monetary stimulus becomes much less likely to be valid with income-sensitive capital

flows. For the monetary stimulus will then lead to extra capital inflow as a result of the monetary expansion increasing the level of earnings expected on equity investments in the country easing monetary policy. A monetary expansion may now therefore cause an increase in net capital inflow rather than the reduction that occurs if relative interest rates alone are assumed to affect net capital inflow. This means that under flexible exchange rates monetary policy could be less effective in influencing domestic activity than it would if fixed-interest capital flows predominated.

Some aspects of fiscal policy

If capital flows are mainly responsive to earnings expectations rather than to the level of interest rates, does this have a bearing on the effectiveness of fiscal policy?

With flexible exchange rates, and if flows into and out of fixed-interest assets are the main form of international capital flows, an easing of fiscal policy, leading to higher interest rates (monetary policy being kept constant) would lead to a rise in capital inflow (in the standard analysis). This would tend to cause appreciation, which will offset (at least) part of the expansionary effect of the fiscal stimulus. If the predominant form of capital flows is into equities, an expansionary fiscal policy could be expected to lead to a much greater rise in net capital inflow. For with a fiscal expansion, both the pull of higher interest rates and that of higher earnings expectations will be operating to encourage capital inflow. This makes it more likely that there will be a degree of appreciation of the currency of the country in question that will tend to offset the expansionary effect of the stimulatory fiscal measures. This is more likely to be of importance for a small and open economy – for which the exchange rate channel is relatively more important than that of domestic markets for the operation of monetary

policy – than for a large one. This consideration tends to favour the use of monetary measures of expansion rather than fiscal ones, if the aim is to bring about a domestic expansion; for with a monetary expansion, the fall in domestic interest rates still causes some outflow of fixed-interest capital, which tends to cause the exchange rate to weaken, whereas a fiscal expansion tends to raise interest rates and so cause appreciation. (The effects on income-sensitive capital flows are common to both monetary and fiscal forms of expansion.) As we saw in the preceding section, monetary measures remain the preferable policy for affecting the exchange rate – or the level of reserves in a fixed exchange rate system.

The Portfolio Balance Approach

The modifications that need to be made to the portfolio balance approach follow logically from those suggested above for the Mundell-Fleming mode. (For the portfolio balance model, see, for example, Branson(1979).) The portfolio balance approach also has two income-earning assets, one within the country being considered and one in the rest of the world. Both of these are fixed-interest assets. The other asset is money (in the country whose policy is being discussed). When the country in question eases its monetary policy, this leads its residents to increase their demand for the external asset, the yield on which is now relatively higher than that available within their country. It will also lead them to hold less money; but the responsiveness of their demand for the external asset to the change in monetary policy is taken to be relatively greater (in terms of elasticity) than that for money. Equilibrium then requires the exchange rate to depreciate to the point where the consequently increased cost of the external asset negates its greater attractiveness.

If, however, the easing of monetary policy increases the attractiveness of income-earning assets in the country where policy is eased, and if the principal form of capital flow relates to equities, rather than to fixed-interest assets, the demand for domestic assets could be expected to *rise* relative to that for external assets when monetary policy is eased. Nor is this effect likely to be any more temporary than the opposite effect that is expected on the basis of the standard models with only fixed-interest assets in the model. For in both cases, there is a process of adjustment at work, which will eventually peter out. But it is possible that some forms of equity flows, especially those relating to direct investment, may take longer to occur than those into and out of fixed-interest assets. The decision to set up a plant in another country, for example, is unlikely to be a quick one. But there appears to be no a priori reason to expect that the likely period of adjustment of the holdings of fixed-interest assets will be any more, or less, short-run or temporary than those occurring through the markets for equity assets.

But in both cases, once the adjustment has been made, the effects on the exchange rate through the current account will tend to offset the effect of the original capital flows. For the income flows associated with the overseas capital holdings will eventually offset part of the original flows of capital. Some of the original weakening of the currency (in the case of the models with fixed-interest assets), or some of the appreciation associated with equity capital flows into the country easing interest rates, will therefore be partly reversed by the subsequent income flows arising from the earnings upon the investments.

The effects on the exchange rate operating through the current account, as a result of the effects of the policy changes on the level of demand, and so on trade, will of course be

common to both models. An easing of monetary (or fiscal) policy will tend to weaken the currency on this score. To this extent, therefore, the medium-run implications for monetary, or fiscal, policy are not affected – at least in direction. The fact remains, however, that in the short to medium run with which most central banks are concerned, the implications of a policy change are different in degree, and may be different in direction from the implications of the models that have been accepted as relevant hitherto, especially for a large country.

Do flexible exchange rates still generally increase the domestic effects of monetary policy, but probably not those of fiscal policy, if capital flows react to income changes?

One implication of the orthodox analysis – based on fixed-interest capital flows – is that a change from a fixed exchange rate system to one of floating rates enhances the effects of monetary policy changes upon domestic activity, but is less likely to enhance the effect of fiscal measures.

This is because when monetary policy is eased (for example), and capital flows outwards as a consequence of the fall in interest rates, this weakens the exchange rate, and thus adds to domestic demand. On the other hand, a fiscal stimulus tends to attract capital inflows seeking the consequently higher interest rates, and the consequent appreciation strengthens the exchange rate, and so offsets some of the expansionary effect, in a floating rate system. By contrast, with fixed rates, a monetary expansion leads to a fall in the reserves, as capital flows out, and this reduces the expansionary effect, whereas with a fiscal expansion, the consequent rise in capital inflow raises the reserves and thus increases the expansionary effect. A change from fixed to flexible exchange rates will enhance the effectiveness of fiscal measures in influencing domestic

demand only if the depreciation resulting from the deterioration in the current account balance resulting from a fiscal expansion exceeds the appreciation resulting from higher capital inflow as a result of the higher interest rates.

If capital flows are sensitive to changes in income as well as to relative interest rates, however, a change from a fixed to a flexible exchange rate system becomes much less likely to enhance the domestic effectiveness of monetary policy, and also less likely to enhance that of fiscal measures. For example, a monetary easing now tends to attract capital inflow in search of the consequently higher earnings on equities, and that will strengthen the exchange rate, offsetting some at least of the expansionary effect of the monetary easing. Similarly, an easing of fiscal policy will also attract more capital in search of higher earnings, so that a switch from a fixed to a flexible exchange rate will be more likely to cause a degree of appreciation that will weaken or negate the expansionary effects of fiscal measures.

Conclusions and Suggestions for Future Empirical Research

If capital flows are to some greater or smaller extent now sensitive to the actual or expected level of income and earnings in a country, this requires some amendment to the models on which the analysis of monetary and fiscal policy in an open economy is based. In general, however, these new considerations do not overthrow the general conclusions from the orthodox body of analysis, except that in the short run monetary policy changes may have an effect on the exchange rate (or the on the reserves in a fixed-exchange rate system) opposite to that which would have been expected if international capital flows had been primarily influenced by relative interest rates.

As major countries find it more difficult than small ones to change the level of their interest rates relative to those in the rest of the world, to that extent the relevance for policy of income-sensitive capital flows is more important for them. But, on the other hand, as the exchange-rate channel for the operation of monetary (and fiscal) policy is more important for smaller countries, to that extent the significance of income-sensitive capital flows is more important for smaller countries. In short, both large and small countries would do well to consider the relevance of income-sensitive capital flows to them in determining their macroeconomic policies.

Clearly it would be helpful to have estimates of the degree of sensitivity of international capital flows to both relative interest rate levels and expected levels of income and earnings in a country. It would be of special interest to have evidence about whether the exchange rates of major countries (in effect, the US and the euro area, and perhaps also Japan) are relatively more subject to the influence of income-sensitive capital than to that of interest rate-sensitive capital flows. It would also be helpful to know whether the changes of policy to which income-sensitive capital flows are sensitive are the same (for a given change in income) whether the change is in monetary policy or fiscal policy. Furthermore, different sorts of fiscal policy – different tax changes and different changes in government expenditure – could have different effects on income-sensitive capital flows for a given effect on actual or expected income. But what seems no longer defensible is to consider the effects on capital flows of changes in monetary and fiscal policy purely in terms of their effects on relative interest rates, and to neglect their possible effects through expected changes in income and earnings on equity investment.

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