

FLOATING EXCHANGE RATES
AND
SUNKEN ECONOMIES

by Leigh Harkness

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*Leigh Harkness
11 Brereton Street
Queanbeyan
NSW 2620*

*Phone/Fax: (02) 6297 3208
E-mail: leigh@pcug.org.au*

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1. Introduction

Milton Friedman's paper entitled "The Case for Flexible Exchange Rates" provided policy makers with the direction for exchange rate policy when external imbalances appeared in the late 1960's and early 1970's. When the opportunity arose, his plan was implemented. Although many of his proposals have since been discredited, the floating exchange rate system remains. Friedman writes that:

A system of flexible or floating exchange rates is absolutely essential for the fulfilment of our basic economic objective: the achievement and maintenance of a free and prosperous world community engaging in unrestricted multilateral trade.

But the floating exchange rate system has not brought about *a free and prosperous world community engaging in unrestricted multilateral trade*. Instead it has sunk economies with slow economic growth, high unemployment and rising levels of foreign debt.

Despite the floating exchange rate system, the growth of GDP in the United States has declined from an average 4 per cent before 1973 to an average 2.4 per cent since 1973 as shown in Figure 1. If it had maintained its previous growth rate, its GDP would have been 40 per cent higher than it is now.

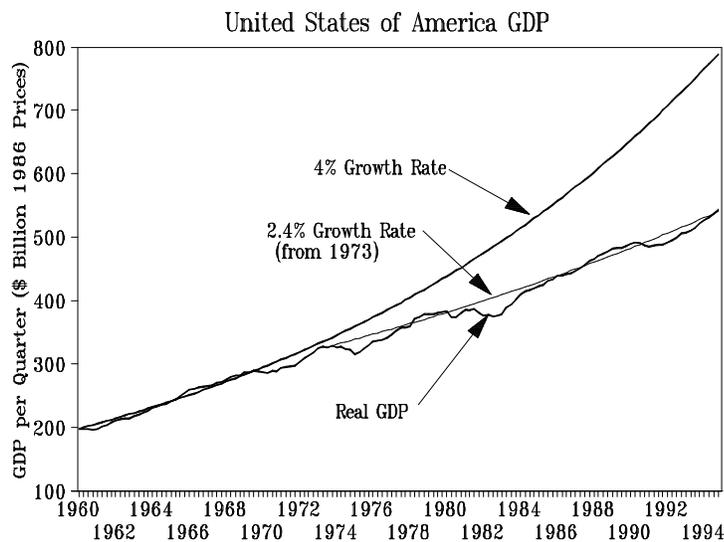


Figure 1

The USA has tried to isolate itself from the imbalances associated with unrestricted multilateral trade. It has adopted a restricted "free trade" zone. It subsidises exports and imposes quantitative restrictions on imports.

European countries have had to use subsidies, also, to support their export industries, particularly agriculture. They have largely abandoned the floating exchange rate system and returned to fixed exchange rates between countries in their trading block. They are

now moving towards a single currency for these countries. That option provides less flexibility than even fixed exchange rates.

In Australia, our rate of economic growth has declined and we have experienced perpetual high rates of unemployment since 1973. The Australia exchange rate was tied to the US dollar at that time and later to a basket of currencies. When the US floated its exchange rate, Australia suffered with the US from the real appreciation of its currency. The subsequent reduction in world demand reduced demand for

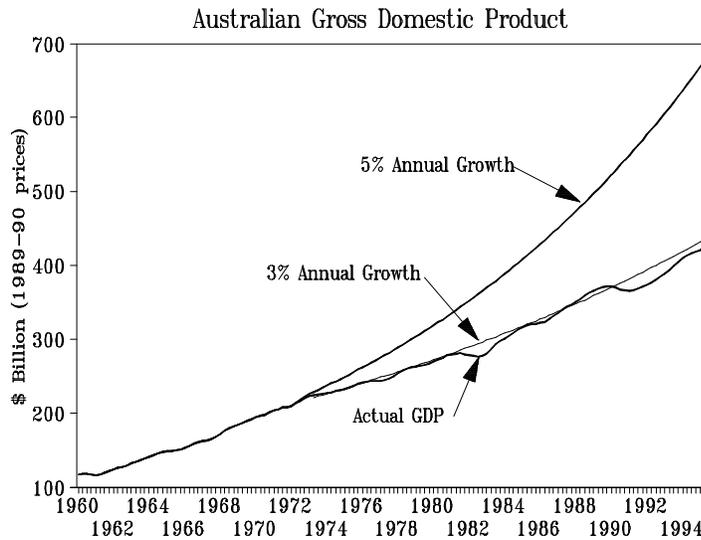


Figure 2

Australian products. Also, the reduction in Australian tariffs contributed to the real appreciation of its currency as it made imports cheaper. Australia's rate of economic growth has declined from an average 5 per cent before 1973 to an average of 3 per cent since 1973 as shown in Figure 2. If Australia's rate of economic growth before 1973 had been maintained, Australia's GDP would be 60 per cent higher than it is now.

Milton Friedman said that:

. . . liberalisation of trade, . . . harmonisation of internal monetary and fiscal policies . . . all of these problems take on a different cast and become far easier to solve in a world of flexible exchange rates and its corollary, free convertibility of currencies.

Liberalisation of trade has not become easier with the floating exchange rate system. Huge imbalances have appeared in world trade flows. Harmonising of internal monetary and fiscal policies have not become any easier. Slow economic growth and high rates of unemployment have provided inadequate revenue to governments to finance the increased burden of social security brought about by the low rates of economic growth.

Friedman continues, in relation to the floating exchange rate system:

. . . unrestricted multilateral trade will become a real possibility . . . without in any way interfering with the pursuit by each nation of domestic economic stability.

The floating exchange rate system has not delivered the promised economic utopia. Instead, it has brought about a dilemma for economists in most countries using the floating exchange rate system. On the one hand there is a need to increase monetary growth to facilitate economic growth. On the other hand there is a need to restrain monetary growth to prevent inflation and constrain the current account deficit and rising foreign debt.

Friedman writes:

The ultimate objective is a world in which exchange rates, while free to vary, are in fact highly stable.

The floating exchange rate system has not achieved the "ultimate objective". Since the float, exchange rates have been highly unstable.

2. Monetary Policy under Alternative Exchange Rate Systems

To understand why the floating exchange rate system has failed, it is necessary to understand the features of the fixed exchange rate system that were so conducive to economic growth. Economic growth requires conditions such as:

- . monetary growth;
- . savings and investment;
- . stable and appropriate prices; and
- . adequate demand.

We will start by considering monetary growth.

Under the fixed exchange rate system, there are two sources of money that increase the money supply:

- . increased foreign reserves (from exports and foreign capital inflow being greater than imports); and
- . increased bank lending (either to government or private sectors from central or commercial banks).

If the first source of monetary growth comes about from an increase in exports relative to imports, then it is a form of national savings. That is, national income is greater than national expenditure. These "national" savings are different from the usual definition of savings which is the portion of national income greater than consumption.

The second source of monetary growth usually finances expenditure above national income. Therefore, this money causes national dis-savings. The management of the fixed exchange rate system usually involved the regulation of bank credit to ensure a balance

between national dis-savings, that reduced foreign reserves, and national savings that increased foreign reserves.

2.1 Rise in Exports Under the Fixed Exchange rate System

Let us consider, first, what happens to the economy when a country increases its money supply through the growth of export income. To do this we will assume, initially, that there are no international capital flows. We will assume, also, that the economy is initially in equilibrium.

Initially, national income rises by the amount of the increased exports. This constitutes an increase in national savings with the rising exports exceeding imports and causing a balance of payments, and current account, surplus.

The increased income from exports generates increased expenditure on both domestic products and imports. If this were a one off increase in exports, the new money would flow around the economy increasing income until it all leaked out as imports. By the time it leaked out, it would have temporarily increased national income by the value of exports times the export multiplier (the inverse of the marginal propensity to import).

If it were a permanent increase in the level of exports, national income would continue to rise while the income from exports exceeded expenditure on imports. This is shown in Figure 3, where exports and imports are initially at the amount X_1 and national income at the amount Y_1 . (See also Appendix 1.) Spending on domestic products is equal to the interval $X_1 - Y_1$.

A rise in exports, from X_1 to the amount X_2 , causes national income to rise. As it rises, spending on domestic products and imports rise also. National income continues to rise until it reaches the amount Y_2 .

When national income is at Y_2 , spending on imports is equal to the income from exports at X_2 . Therefore, leakages of money would equal injections

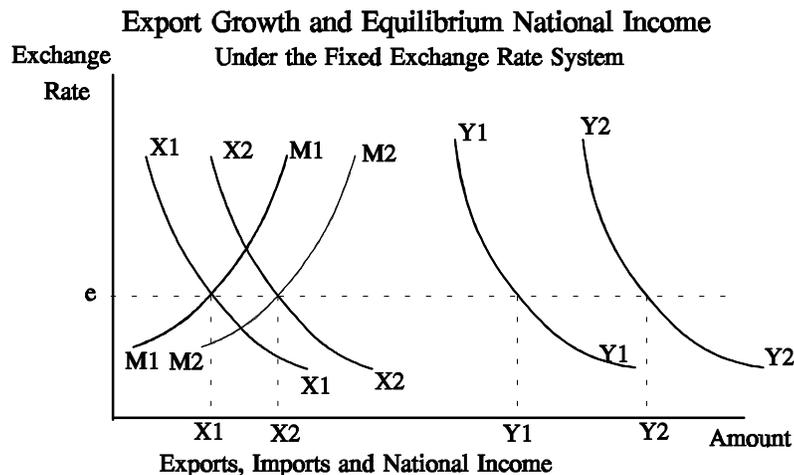


Figure 3

from exports, and national income would be at equilibrium. At this equilibrium, spending on domestic products would have increased from the interval X1-Y1 to the interval X2-Y2.

In this example, the economy was initially at equilibrium with national expenditure equal to national income and without any monetary growth.

When exports initially increased, they caused national income to exceed national expenditure. That is, it caused a rise in national savings. It also increase the money supply and rising foreign reserves.

The additional income and money enabled the economy to increase its expenditure both on domestic products and imports. Spending on domestic products increases national income further. That additional income generated expenditure on domestic products and imports again.

When national income reached the amount Y2, spending on imports equalled export income and so there is no further growth in savings or the money supply. Also, foreign reserve would have increased while export were greater than imports but would now be stable.

Therefore, as a consequence of the export growth, there is monetary growth, income growth and increased foreign reserves. These foreign reserves were achieved through a rise in national savings during the transitional period when national income was greater than national expenditure.

2.2 Rise in Bank Credit Under the Fixed Exchange Rate System

Let us now consider the consequence of an increase in the money supply brought about by an increase in bank credit (either to the public or private sectors). This is presented in Figure 4. (See also Appendix 2.) We start at the same equilibrium position as above in Figure 1 with exports at the amount X1 and national income and expenditure at the amount Y1 (or E1).

In this case we assume that there is an increase in bank credit that injects additional money into the economy. The total injection of money into the economy is represented by the line X1+Cr. The additional money from the bank credit causes national expenditure to rise on both domestic products and imports. Expenditure on domestic products always adds to national income. Expenditure on imports does not add to national income. It is a transaction that causes national expenditure to exceed national income. That is, it is a causes dis-saving and it reduces foreign reserves.

National income and expenditure will continue to rise until the leakages on imports equal the injections of money from exports plus credit. This equilibrium position occurs when

national expenditure is at the amount E2, and national income is at the amount Y2. (National expenditure exceeds national income as it is financed from national income plus the credit growth.)

At this level of national expenditure, imports are at M2 while exports have remained at X1. A country in this position would be in an

equilibrium position but experience persistent national dis-savings. This dis-saving is equal to the interval Y2-E2. It is also equal to the amount by which imports exceed exports, M2-X1, and to the amount of credit growth.

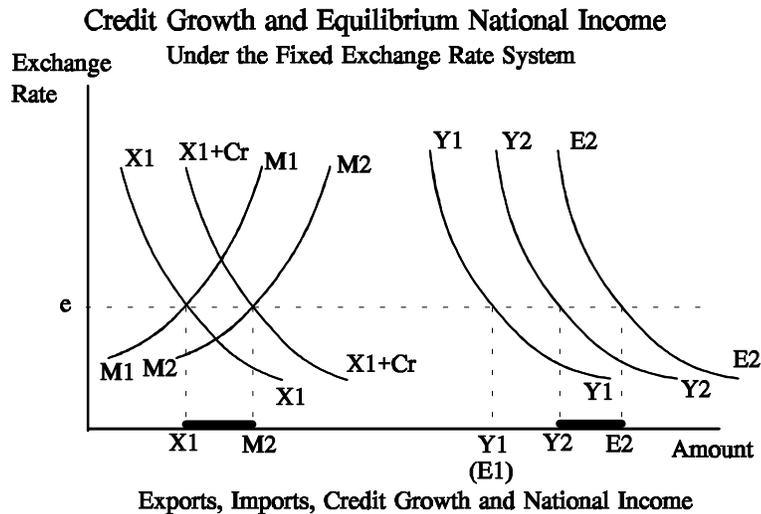


Figure 4

However, if the country wishes to maintain its national income, it needs to maintain the credit growth. Therefore, the country would experience persistent current account deficits and falling foreign reserves.

However, a central bank is unlikely to allow a situation to persist that caused the decline of its foreign reserves. It is likely to take action to reduce the growth of bank credit. Thus, under the fixed exchange rate system, the growth of bank credit is unlikely to be a sustainable source of money to finance economic growth.

Another problem with credit growth as a stimulant of economic growth is that the rate of credit growth must rise for the economy to grow. This can only increase the rate at which foreign reserves are depleted or foreign debt accumulated.

2.3 Limits to Credit Growth Under the Fixed Exchange Rate System

It is possible to sustain growth in bank credit under a fixed exchange rate system without reducing foreign reserves or raising foreign debt. To do so requires that credit growth does not exceed the monetary growth that otherwise would have come from increased exports.

Returning to Figure 3, this means that for balance of payments stability, credit growth should be permitted only while the economy is growing from the amount Y1 to Y2; that

is, while imports are rising from the amount X_1 to X_2 . When imports equal exports, credit growth should cease. That is, these two sources of money need to be balanced. In an economy with continual export growth, it is possible to have continual credit growth.

Such an outcome can be achieved by linking the growth of bank credit to foreign reserves. This is the principle used by currency boards in places like Hong Kong, and more recently in Argentina. I have also had the opportunity to apply this principle in a small country and found that it was possible to balance the foreign sources of monetary growth and domestic sources of monetary growth. The principle ensures that the economy does not experience balance of payments problems.

In his paper, Friedman does not show any appreciation of the need to balance domestic sources of money with foreign sources so as to balance national income and national expenditure, or savings and dis-saving. To Friedman, the source of monetary growth was irrelevant. We have seen from the above analysis that such an approach, if applied to monetary policy, can lead to undesirable outcomes.

2.4 Monetary Growth under the Floating Exchange Rate System

Friedman considered that one of the most important reasons for adopting the floating exchange rate system was that it allowed economies to have an independent monetary policy. He wrote:

In effect, flexible exchange rates are a means of combining interdependence among countries through trade with a maximum of internal monetary independence; they are a means of permitting each country to seek for monetary stability according to its own lights, without either imposing its mistakes on its neighbours or having their mistakes imposed on it.

Not only does the system protect an economy from failed economic policies, it also prevents a country from benefiting from its economic successes, such as increased exports. Rising exports, under the fixed exchange rate system, provided economies with a source of monetary growth that came from national savings. Under the floating exchange rate system, exports no longer provided a source of monetary growth. The only source of monetary growth available to these economies is bank credit.

Economies need monetary growth to facilitate economic growth. But, for most economies using the floating exchange rate system, this has meant that they must also experience current account deficits. Therefore, these countries can only achieve economic growth if they also accept rising foreign debt, or foreign equity. That is, they can grow only by dis-saving.

As mentioned earlier, this outcome has brought about a dilemma for policy makers, between the need to increase the money supply to facilitate economic growth and the need

to restrain the growth of the money supply to prevent the rise of foreign debt (and inflation). To resolve this dilemma, policy makers have promoted slow economic growth as a desirable economic objective. Even high rates of unemployment have been justified as necessary to contain inflation. Friedman's objective of . . . *the achievement and maintenance of a free and prosperous world community engaging in unrestricted multilateral trade* . . . has become a dream of a bygone era.

Also, economies have sunk into debt as a consequence of the monetary deficiencies of the floating exchange rate system.

The evidence for this is compelling. Figure 5 is a graph of the relationship between the growth of the money supply (currency plus commercial bank liabilities) and the current account deficit for the Philippines.

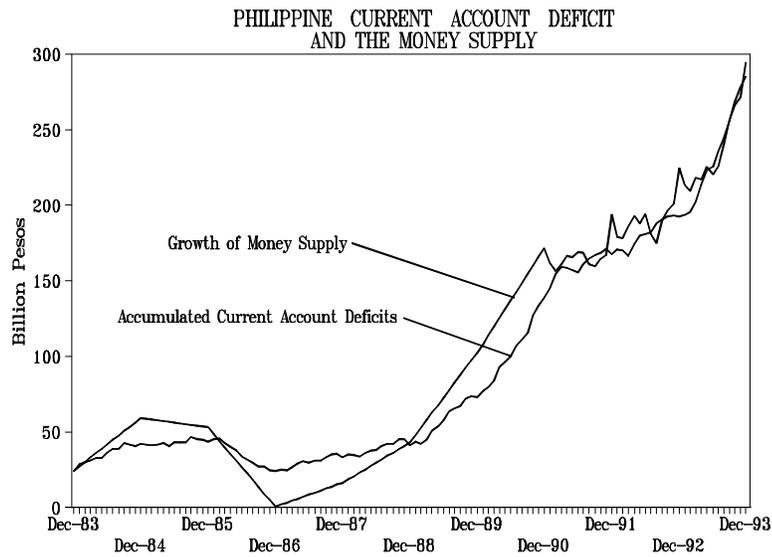


Figure 5

The graph provides evidence that clearly supports the theoretical analysis above. That is, that the growth of the money supply in the Philippines has financed excessive demand that has caused its current account deficits.

The Philippines is a special case in Asia. It is the runt in a litter of Asian tigers. While its neighbours prosper with regulated exchange rates, the Philippines, with its floating exchange rate, is lagging far behind.

Figure 6 compares the money supply in Australia with the current account deficit. The data I used for the money supply comprise currency plus bank liabilities. It has been adjusted for the transformation of non-bank financial institutions into banks. From this money supply, the amount money derived from the growth in foreign reserves (from transactions) and from the growth in bank foreign assets (data available since 1985 only) has been deducted. The money from these foreign sources is shown separately.

The Australian example also reveals the strong relationship between the growth of the money supply (sourced from bank credit) and the current account deficit. It indicates also that the money generated from growth in foreign reserves and foreign assets does not

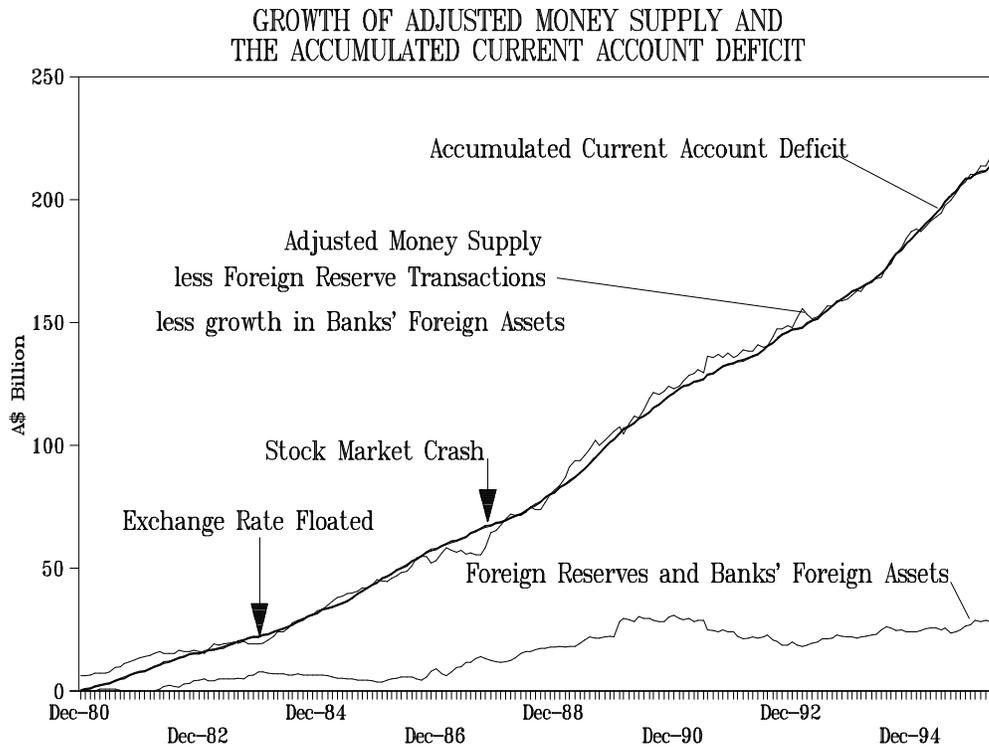


Figure 6

contribute to the current account deficit.

So, rather than providing monetary independence, the floating exchange rate system has eliminated the source of monetary growth that allowed monetary independence: the source that did not cause balance of payments difficulties. It has suppressed the source of money that came about from increased savings. It left economies with a source of money that was generated from dis-savings and has burdened them with foreign debt.

As a consequence, governments have had to use monetary and fiscal policy in an attempt to deal with the problems that have flowed from the floating exchange rate system. The floating exchange rate system has not provided . . . *a maximum of internal monetary independence.*

3. Prospering from Free Trade Under the Floating Exchange Rate System

Friedman's vision of the floating exchange rate system bringing about . . . *a free and prosperous world community engaging in unrestricted multilateral trade . . .* has not eventuated. When we consider how the floating exchange rate system treats our attempts to increase exports, we can understand why.

Figure 7 illustrates the effects of an increase in exports under the floating exchange rate system. (See also Appendix 3.) This should be contrasted with Figure 3 which shows the same increase in exports under the fixed exchange rate system.

As in Figure 3, exports and imports are initially equal at the amount X_1 . National income is at the amount Y , with income from domestic products represented by the interval X_1 - Y .

We then assume that the supply of exports rises from the line X_1 to the line X_2 . The increased demand on the foreign exchange market for domestic currency created by

Export Growth & Equilibrium Exchange Rate & National Income Under the Floating Exchange Rate System

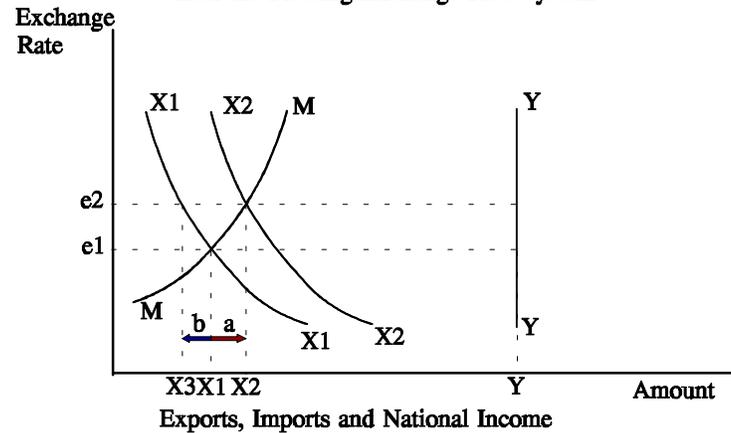


Figure 7

the export growth causes the exchange rate to rise from e_1 to e_2 . At that exchange rate, exports increase to the amount X_2 .

At the higher exchange rate, imports become cheaper so that domestic spending shifts from domestic products to imports. That is, imports increase from the amount X_1 to X_2 . That shift in spending to imports reduces spending on domestic products from the interval X_1 - Y to the interval X_2 - Y .

Therefore, the increase in exports has not caused national income to rise. Although exports have increased, it has been at the cost of import competing industries that have suffered a loss of income when national spending shifted from domestic products to imports. This loss in income is equivalent to the interval X_1 - X_2 marked with the arrow "a". Also, the original exporters have suffered a loss in income. Originally they earned the amount X_1 for their exports. After the rise in the exchange rate, their export incomes fall to the amount X_3 shown by the arrow "b". Thus the net effect of increased exports is:

- . a rise in the exchange rate;
- . a rise in imports;
- . a rise in the proportion of income spent on imports; and
- . stable national income.

Under the floating exchange rate system, increases exports no longer increase national savings and the money supply. Nor do they provide a route to increased prosperity. Rather, they can reduce the income of traditional exporters and of import competing industries.

This has been our experience in Australia. The government has been fostering export growth. That has led to a fall in the incomes of traditional export industries, such as agriculture. Also, it has led to the demise of import competing industries, particularly manufacturing as shown in Figure 8.

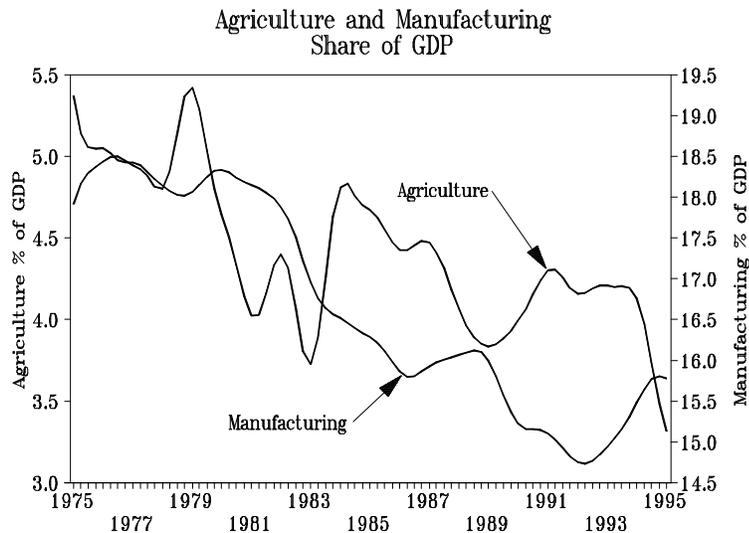


Figure 8

The effect of export growth on the proportion of income spent on imports in

Australia is presented in Figure 9. This graph shows exports and imports as a proportion of national income. Australia floated its exchange rate in December 1983. Subsequent increases in exports raised the real exchange rate. This increased the average proportion of national income spent on imports from around 14.5%, in 1983, to 22% in 1995.

The marginal propensity to import has been 38% in the period since 1983. This figure was calculated using the growth in imports relative to the growth in national income between 1983 and 1995. The marginal propensity to import was only 17% for the previous 12 years (1971-1983). That is, the marginal propensity to import has more than doubled since the exchange rate was floated.

The rise in the average proportion of income spent on imports indicates an increase in the real exchange rate; that is, in the price of domestic products relative to imports. Demand for imports has expanded at the cost of the sales of domestic products because the exchange rate has made imports relatively cheaper than domestic products.

Exports have increased as a proportion of national income and thereby contributed more to national income. However, if the exchange rate had been lower, at a more optimal level, that additional export income could have generated increased demand for domestic products which would have provided more income; enough to ensure full employment.

The achievement of full employment would have been a very real possibility, particularly when one considers the effect of the export multiplier. The real value of exports increased 151% between 1983 and 1995. If it had stayed constant, the export multiplier would have increased national income by a similar order of magnitude.



Figure 9

But, the appreciation of the real exchange rate has increased the proportion of income spent on imports and reduced the export multiplier from 7.1 in 1983 to 4.6 in 1995. Hence, national income has increased only 49%.

Therefore, the floating exchange does not bring about economic prosperity. Rather than, as Freidman says, . . . *being absolutely essential for the fulfilment of our basic economic objective: the achievement and maintenance of a free and prosperous world community engaging in unrestricted multilateral trade . . .*, it is likely to frustrate the attainment of that objective.

4. The Floating Exchange Rate System with Credit Growth

4.1 Credit Growth without International Capital Flows

Under the fixed exchange rate system, we saw that the growth of bank credit increased national dis-savings. Under the floating exchange rate system, credit growth is a necessary condition for national dis-savings and current account deficits but it is not the only condition. If the average propensity to import declines (in response to a devaluation of the exchange rate) it can offset the rise in imports generated by increased credit.

To illustrate this effect, let us first consider an economy that has no international capital flows. Under the floating exchange rate system, its export receipts must equal its import payments. This case is shown in Figure 10. Exports and imports are initially at the amount X_1 and national income and expenditure are initially at the amount Y_1 . (See Appendix 4.)

We then assume that bank credit grows to the amount Cr. The credit growth raises national expenditure from the line Y to E2 and then E3. As it does, it raises the demand for imports which shifts from the line M1 to M2 and then to M3.

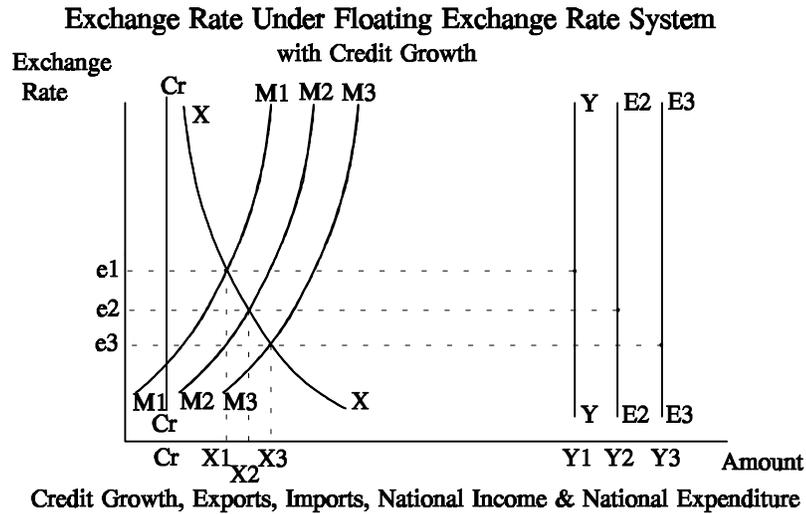


Figure 10

The supply of exports is represented by the line X1. As imports increase, the exchange rate must devalue from e1 to e2 and then to e3 to clear the foreign exchange market.

As the exchange rate devalues, export income rises from the amount X1 to X2 and then X3. Also, the payments for imports rise from the amount X1, to X2 and X3. National income also increases (with national expenditure) from the amount Y1 to Y2 and Y3.

Initially, national income was made up of exports, equivalent to X1, and domestic sales, equivalent to the interval X1-Y1. If the exchange rate were fixed, the increased expenditure from credit growth would have caused imports to exceed exports.

However, under the floating exchange rate system, the demand for imports increases the supply of domestic currency on the foreign exchange market and forces the exchange rate to devalue. As it does, it makes imports relatively more expensive so that some spending on imports is contracts and that spending is redirected to domestic products. That is, the average propensity to import declines and the average propensity to buy domestic products increases. Hence, sales of domestic products increases from the interval X1-Y1 to X2-Y2 and then to the interval X3-Y3. This together with the increased export income means that national income increases together with national expenditure and the economy does not experience a current account deficit.

So, in an environment without international capital flows, the floating exchange rate system can balance the current account despite credit growth. However, it does require exchange rate instability.

4.2 Credit Growth with International Capital Inflow

We will now assume that the economies receives foreign capital inflow and these flows are speculative. That is, if foreign investors consider that an exchange rate is overvalued, they will withhold their investment. If they consider that a currency is undervalued, they may take advantage of the opportunity to increase their investment in a country.

This foreign investment is represented in Figure 11 as the line K. (See also Appendix 5.) We will assume that, as for Figure 10, the exchange rate is initially at e_1 , exports and imports are at the amount X_1 and national income and expenditure is at the amount

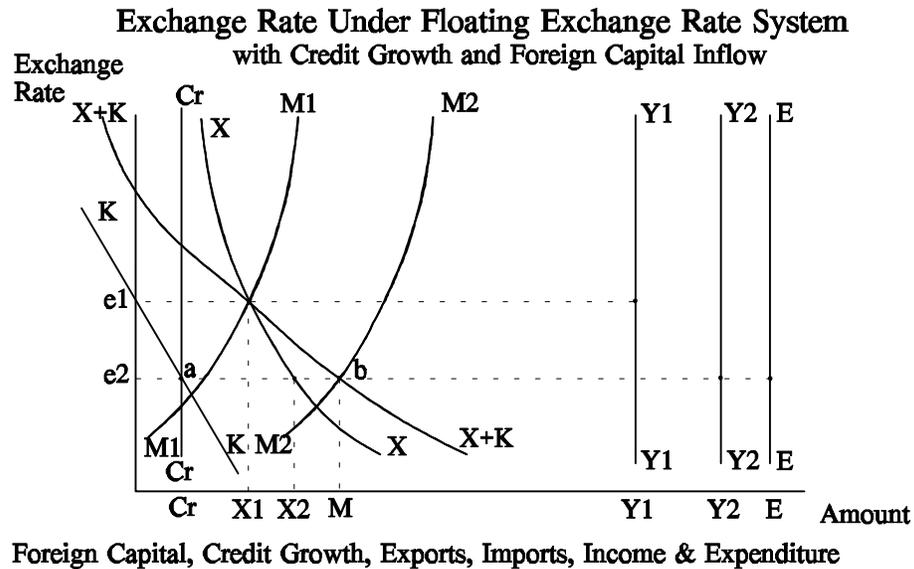


Figure 11

Y_1 . While the exchange rate is at e_1 , there is no foreign capital inflow.

We then assume that there is credit growth, given by the line Cr . This credit raises national expenditure and, as in Figure 10, shifts the demand for imports to the right from the line M_1 to the line M_2 . Note that the demand for domestic currency on the foreign exchange market is no longer the exports line, X , but the export plus international capital schedule given by the line $X+K$.

As in Figure 10, the increased supply of domestic currency on the foreign exchange market (to pay for imports) causes the exchange rate to fall. This leads to a rise in export incomes. However, it also leads to a rise in foreign investment.

When the exchange rate falls to e_2 , foreign capital inflow is equal to the credit growth at "a" and the foreign exchange market is cleared at "b". At the lower exchange rate, national expenditure, represented by line E , exceeds national income, represented by line Y_2 , by the amount of the credit growth, Cr . Also, imports, M , exceed exports, X_2 , by the amount of credit growth.

If the exchange rate were to fall below e_2 , foreign capital inflow would exceed credit growth. That would require national expenditure to exceed national income by more than credit growth. But this is not possible. Therefore, the exchange rate remains stable at e_2 .

Carmichael and Stammer¹ also describe this effect from a slightly different perspective. They write:

If conditions in one country are conducive to capital inflow in excess of the trade deficit, then instead of a payments surplus accumulating, the exchange rate with respect to the rest of the world would appreciate, thus removing the conditions leading to the imbalance.

That is, if the exchange rate were to fall below e_2 and cause the capital flow to be greater than the current account deficit ($M-X_2$), then the exchange rate would appreciate again to remove the imbalance.

At e_2 , the supply of foreign capital remains equal to the amount of credit growth, Cr . This can be a stable position but it is a position where current account deficits persist. This is not just a theoretical outcome. They are a real outcome as can be seen in Figures 5 and 6 for the Philippines and Australia respectively, where the current account deficit is equal to the credit growth, including credit to government from the printing of notes and coins.

While credit growth in this case does not cause foreign reserves to decline, as under the fixed exchange rate system, it can still cause dis-savings that result in an equivalent rise in foreign debt.

While national income is stable at Y_2 , the money supply is not stable. If there is monetary growth while national income is stable, it can only bring about inflationary pressures. Inflation has an effect similar to the appreciation of the exchange rate. It shifts the supply of exports to the left (and thereby reduces national income). It also shifts the demand for imports to the right, increasing imports and thereby reduces spending on domestic products (and national income).

If the exchange rate remains nominally stable, inflation can inflate the real exchange rate. This is likely to reduce the demand for domestic products and bring about unemployment. This gives the impression that there is inadequate demand in the economy. At the same time, the economy can experience excessive demand for imports that causes current account deficits.

This is the economic dichotomy persists in Australia. Dis-savings continue with foreign debt rising as current account deficits persist. The monetary growth from increased credit does provide opportunities for some growth in national income. But this money is devalued by inflation so that its capacity to generate further employment is reduced.

5. The Floating Exchange Rate System with International Capital Outflow

5.1 International Capital Inflow without Credit Growth

By way of contrast, we will consider the case of an economy, such as Japan, that uses the floating exchange rate system and has net international capital outflows. These capital outflows are forms of national savings.

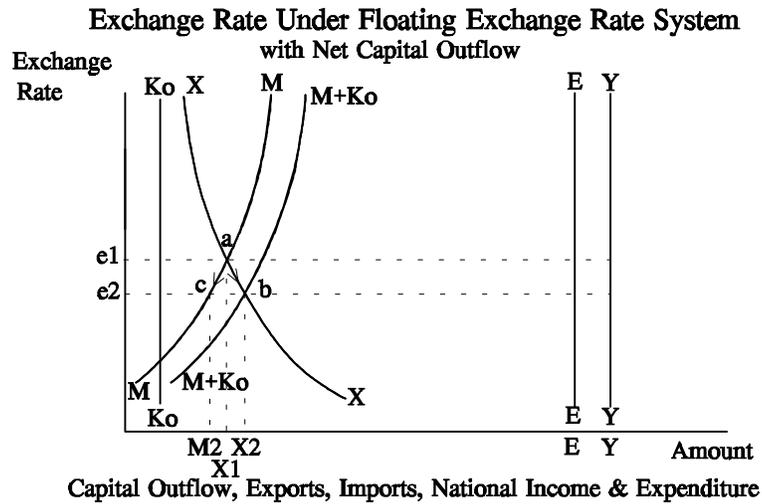


Figure 12

The first example illustrates the case of an economy with international capital inflow but without domestic credit

growth. It is shown in Figure 12 (and Appendix 6). Initially, the exchange rate is at e_1 , with exports equal to imports at the amount X_1 and national expenditure and national income equal at the amount Y .

The economy then increases its national savings by investing overseas the amount represented by the line Ko . That investment shifts the supply of domestic currency on its foreign exchange market from the line M to the line $M+Ko$. This shift causes the exchange rate to fall to e_2 .

At the lower exchange rate, exports expand along the export schedule from "a" to "b", raising exports from the amount X_1 to X_2 . Imports contract along the import schedule from "a" to "c" and falling from the amount X_1 to M_2 .

Although the capital outflow has reduced national expenditure, national income remains constant. Before the investment overseas, national income was made up of exports equal to the amount X_1 and income from the sale of domestic products equal to the interval $Y-X_1$. After the investment, income from exports increases from X_1 to the amount X_2 .

Offsetting this, the act of saving has reduced sales of domestic products to the domestic economy from the interval $Y-X_1$ to the interval $E-M_2$. Hence, although the components of income have changed, national income remains constant at the amount Y .

A country in this condition would experience growing foreign wealth while maintaining its national income. As national income and the money supply are both stable, the economy is unlikely to experience any significant inflation other than the rise in import prices.

5.2 International Capital Outflow with Credit Growth

Let us assume that this economy with international capital outflow now has credit growth. This credit growth is represented in Figure 13 by the line Cr. (See also Appendix 7). The exchange rate is assumed to be initially at e_1 where

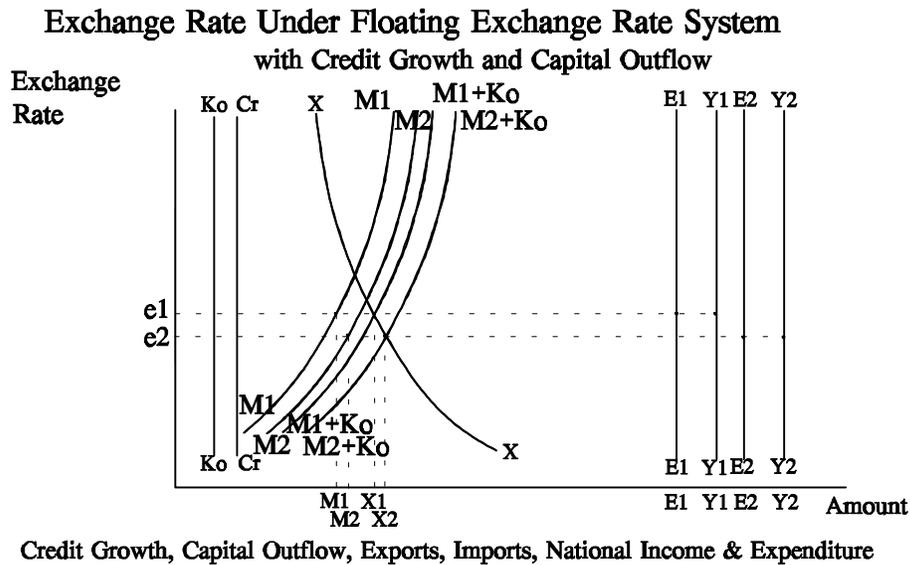


Figure 13

exports are at the amount X_1 , imports at the amount M_1 , and the difference between them equal to the foreign capital outflow, K_o . National income is at the amount Y_1 , national expenditure at the amount E_1 and national savings is equal to the interval $E_1 - Y_1$.

When bank credit increases, it shifts the national expenditure line to the right from E_1 to E_2 . This shifts the demand for imports to the right, also, from the line M_1 to the line M_2 . This shift in the demand for imports raises the supply of domestic currency on the foreign exchange market from the line $M_1 + K_o$ to the line $M_2 + K_o$. The export line, X , remains unchanged.

The foreign exchange market is now cleared at an exchange rate of e_2 . At this rate, exports increase to the amount X_2 and imports increase from the amount M_1 to M_2 . Sales of domestic products on the domestic market increase from the interval $M_1 - E_1$ to the interval $M_2 - E_2$. These domestic sales are added to the new export income to determine national income which increases from the amount Y_1 to Y_2 .

Thus a country using the floating exchange rate system with net international capital outflow and credit growth is likely to experience economic growth with rising foreign

wealth. National income continues to exceed national expenditure so that national savings are maintained, despite the credit growth.

The rate of monetary growth in this economy is likely to be less than the rate of growth of national income. Hence the economy is unlikely to experience significant inflation in domestic prices.

This example resembles the experience of Japan from the 1970's until 1991. The danger in this economic environment is that the economy does not have the usual signals such as inflation and current account deficits which might otherwise indicate a need to restrain credit growth. This may explain why Japanese banks were allowed to lend large amounts of money in the 1980's.

When net foreign investment declined in 1991, it caused the value of the Yen to rise. This reduced export income and shifted spending to imports, thereby reducing national income and causing unemployment.

6. Conclusion

This is not an exhaustive analysis of how the floating exchange rate system causes distortions in economies. I have not considered the effects of exchange rate instability nor the effects of foreign equity investment.

However, from what I have presented, it is clear that the fate of countries using the floating exchange rate system is largely dependant upon the direction and magnitude of international capital flows. That is, upon national savings.

If economies using the floating exchange rate system wish to discourage capital inflow that causes national dis-savings, they must adopt a policy of low interest rates. Therefore, the floating exchange rate system does not allow economies . . . *a maximum of monetary independence.*

James Tobin has recognised the distortive influence of international capital flows on economies using the floating exchange rate system. He has advocated a tax on such transactions. However, his tax would penalise the stabilising short term capital movements without significantly affecting the long term capital flow which are the real source of the exchange rate distortions.

Also, Milton Friedman suggests that:

It is no answer to this argument to say that capital flows can be restricted by direct controls, since our ultimate objective in using this method is precisely to avoid such restrictions.

Nor does Friedman recommend other forms of direct control:

. . . direct control of imports, exports, and capital transactions by techniques other than the price system necessarily means extending such control to many internal matters and interfering with the efficiency of the distribution and production of goods- some means must be found for rationing imports that are being held down in amount or disposing of increased imports and for allocating reduced exports or getting increased exports.

For countries that are attractive to foreign investment such as the United States, Canada, Australia, New Zealand and most of Europe, there appears to be no hope under the floating exchange rate system. They are sinking under the system, doomed to life of rising foreign debt, slow economic growth and high levels of unemployment.

What has been done to overcome these problems? As mentioned in the introduction, Europe has return to a system of fixed exchange rates within its limited world. Yet even this has not been satisfactory. The United States has tried a restricted "free trade" zone. But this has not solved its problems.

Friedman recognises that there may be failings in the floating exchange rate system and has concluded:

. . . yet the market for foreign exchange, it can be said, is so narrow, foresight so imperfect, and private speculation so dominated by socially irrelevant political considerations that there is an insufficient smoothing-out of the adjustment process. For this to be a valid argument against flexible exchange rates, even if true, there must be some alternative that promises a better pace and timing of adjustment.

Before we take up his suggestion and can consider alternative exchange rate systems, we must recognise that the floating exchange rate system has failed. It has failed because it:

- . prevents the creation of money from sources that increase national savings and permits only the creation of money from bank credit and this can cause national dis-saving;
- . prevents increased exports from stimulating economic growth;
- . fosters inappropriate monetary growth rates;
- . permits international capital flows to distort the exchange rate; and
- . produces unstable exchange rates.

Once we recognise these failings and the way that they have devastated our own economies, we will understand the need to consider alternative variable exchange rate systems.

Last year, at this conference, I presented an example of such a system. It was called the Optimum Exchange Rate System. I do not claim that system to be the only alternative. There may be other systems that produce more appropriate and stable exchange rates.

Economics seeks to utilise the available resources to maximise production so as to improve the welfare of the community. The floating exchange rate system does not contribute towards the attainment of that objective. The challenge for economists is to now consider the alternatives and if none are suitable, devise a more efficient exchange rate system that contributes to the attainment of our economic objective.

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APPENDIX

This appendix provides algebraic means of illustrating the points made in the text.

Appendix 1

The following is an algebraic presentation of the points made in Figure 3. Under the fixed exchange rate system, increases in exports can increase the money supply. This analysis illustrates the effect of this source of money upon the economy.

Exports are assumed to be fixed in terms of foreign currency. In terms of domestic currency, exports are given by:

$$X = \frac{X_f}{e} \tag{1.1}$$

where X is exports in terms of domestic currency;
 X_f is exports in terms of foreign currency; and
 e is the exchange rate.

Imports are given as:

$$M = e m E \tag{1.2}$$

where M is imports;
 m is the average propensity to import (when $e=1$); and
 E is national expenditure.

The economy is assumed to be in equilibrium when the leakages from the economy as payments for imports equal the injections into the economy in the form of export income. That is, when:

$$M = X \tag{1.3}$$

At equilibrium, national expenditure equals national income:

$$E = Y \tag{1.4}$$

Substituting the equilibrium condition given in equation (1.4) into equation (1.2) for imports gives:

$$M = e m Y \tag{1.5}$$

Substitution equation (1.3) into equation (1.5) gives:

$$X = em Y \quad (1.6)$$

By rearranging equation (1.6) we can say that equilibrium national income is equal to exports over the average propensity to import, taking the denominator "em" to be the average propensity to import. That is:

$$Y = \frac{X}{em} \quad (1.7)$$

Hence, under the fixed exchange rate system, export growth brings about growth in the equilibrium level of national income.

Appendix 2

Appendix 2 illustrates the points made in Figure 4. It considers the effect on the economy of the growth in the money supply from bank credit.

Exports are defined by:

$$X = \frac{X_f}{e} \quad (2.1)$$

where X is exports in terms of domestic currency;
 X_f is exports in terms of foreign currency; and
 e is the exchange rate.

Imports are:

$$M = em E \quad (2.2)$$

where M is imports;
 m is the average propensity to import (when $e=1$); and
 e is national expenditure.

The economy is assumed to be in equilibrium when the leakages from the economy, in the form of imports, equals the injections into the economy, in the form of exports plus bank credit. That is, when:

$$M = X + Cr \quad (2.3)$$

where Cr is the growth in bank credit.

National expenditure equals national income plus the growth in bank credit at all times, regardless of whether national income is in equilibrium. That is:

$$E = Y + Cr \quad (2.4)$$

Substituting the equilibrium condition given in equation (2.4) into equation (2.2) for imports, gives:

$$M = e m (Y + Cr) \quad (2.5)$$

Substitution the equilibrium condition defined in equation (2.3) into equation (2.5), gives:

$$e m (Y + Cr) = X + Cr \quad (2.6)$$

By rearranging equation (2.6) we can say that at equilibrium, national income is equal to exports plus the growth in bank credit over the average propensity to import less the growth in bank credit. That is:

$$\begin{aligned} Y + Cr &= \frac{X + Cr}{e m} \\ Y &= \frac{X + Cr}{e m} - Cr \\ Y &= \frac{X}{e m} + \left(\frac{1}{e m} - 1\right)Cr \end{aligned} \quad (2.7)$$

Therefore, increases in the rate of credit growth also contribute to the growth of national income under the fixed exchange rate system. However, the demand generated by the credit growth causes imports to exceed exports.

Appendix 3

Figure 7 and this appendix illustrate the effect of a rise in exports under the floating exchange rate system. There are assumed to be no international capital flows in this economy.

Exports are:

$$X = \frac{X_f}{e} \quad (3.1)$$

where X is exports in terms of domestic currency;
 X_f is exports in terms of foreign currency; and
 e is the exchange rate.

Imports are given as:

$$M = emE \quad (3.2)$$

where M is imports;
 m is the average propensity to import (when $e=1$); and
 E is national expenditure.

The floating exchange rate system ensures that international receipts and payments are equal at all times. In this example, this means that imports equal exports (there are no international capital transactions). Therefore:

$$M = X \quad (3.3)$$

This requires that national expenditure is equal to national income or be at equilibrium at all times, so that:

$$E = Y \quad (3.4)$$

From equation (3.4) we can replace national expenditure with national income in equation (3.2) so that imports are now:

$$M = emY \quad (3.5)$$

From equation (3.3), we can substitute exports for imports in equation (3.5) to obtain:

$$X = emY \quad (3.6)$$

Equation (3.6) can be rearranged to define income as a function of exports, that is:

$$Y = \frac{X}{em} \quad (3.7)$$

Substituting equation (3.1) for exports into equation (3.7) gives national income as a function of the value of exports in foreign currency and the exchange rate:

$$Y = \frac{X_f}{e^2 m} \quad (3.8)$$

Exports and imports are defined in relation to the exchange rate in equations (3.1) and (3.2). When these equations are substituted into equation (3.3), we obtain:

$$em E = \frac{X_f}{e} \quad (3.9)$$

This can be rearranged as:

$$e^2 = \frac{X_f}{m E} \quad (3.10)$$

Substituting equation (3.10), for the exchange rate squared, into equation (3.8), defining national income in terms of exports and the exchange rate, gives:

$$Y = \frac{X_f}{\frac{X_f}{m E} m}$$

$$Y = E \quad (3.11)$$

Therefore, national income does not increase in response to an increase in exports, under the floating exchange rate system.

Appendix 4

Figure 10 and this Appendix illustrate the effect of credit growth upon an economy using the floating exchange rate system. This economy is assumed not to have international capital flows.

Exports are defined as:

$$X_t = \frac{X_f}{e_t} \quad (4.1)$$

where X_t is exports at time "t" in terms of domestic currency;
 X_f is exports in terms of foreign currency; and
 e_t is the exchange rate at time "t".

Imports are given as:

$$M_t = e_t m E_t \quad (4.2)$$

where M_t is imports at time "t";
 m is the average propensity to import (when $e=1$); and
 E_t is national expenditure at time "t".

National expenditure is financed from national income in the previous period plus credit growth. That is:

$$E_t = Y_{t-1} + Cr_t \quad (4.3)$$

where Cr_t is the growth in the money supply from bank credit to both the public and private sectors at time "t".

The floating exchange rate system ensures that foreign receipts equal payments overseas, at all times. There are no capital flows in this example, so that imports equal exports:

$$M_t = X_t \quad (4.4)$$

National income is made up of sales of products on the domestic market and exports. Sales on the domestic market are equal to total national expenditure less imports. Therefore, national income can be put:

$$Y_t = E_t - M_t + X_t \quad (4.5)$$

From equation (4.4) we know imports are equal to exports. Hence, substituting that into equation (4.5) reveals that national income equals national expenditure at all times:

$$Y_t = E_t \quad (4.6)$$

Substituting national expenditure as defined in equation (4.3) into equation (4.6) reveals that the growth in national income is equal to the growth of bank credit. That is:

$$\begin{aligned} Y_t &= Y_{t-1} + Cr_t \\ Y_t - Y_{t-1} &= Cr_t \end{aligned} \quad (4.7)$$

To maintain the balance between exports and imports while the economy is growing, the exchange rate must devalue to increase exports and reduce the average propensity to import. The effect of credit growth on the exchange rate is evident by substituting equations (4.1) and (4.2) into (4.4) such that:

$$e_t m E_t = \frac{X_f}{e_t} \quad (4.8)$$

Substituting equation (4.3) in equation (4.8) gives:

$$e_t m (Y_{t-1} + Cr_t) = \frac{X_f}{e_t} \quad (4.9)$$

Solving for the exchange rate "e" gives:

$$\begin{aligned} e_t^2 &= \frac{X_f}{m(Y_{t-1} + Cr_t)} \\ e_t &= \sqrt{\frac{X_f}{m(Y_{t-1} + Cr_t)}} \end{aligned} \quad (4.10)$$

Therefore, as the growth in the bank credit is in the denominator, any increase in the rate of growth of bank credit is likely to cause the exchange rate to devalue.

Hence, credit growth in this economy (with a floating exchange rate) provides economic growth (4.7) together with a depreciating exchange rate (4.10).

Appendix 5

Figure 11 and this Appendix illustrate the effect of foreign capital inflow on an economy which has credit growth and uses the floating exchange rate system.

Exports are given as:

$$X_t = \frac{X_f}{e_t} \quad (5.1)$$

where X_t is exports at time "t" in terms of domestic currency;
 X_f is exports in terms of foreign currency; and
 e_t is the exchange rate at time "t".

Imports are given as:

$$M_t = e_t m E_t \quad (5.2)$$

where M_t is imports at time "t";
 m is the average propensity to import (when $e=1$); and
 E_t is national expenditure at time "t".

National expenditure is financed from national income in the previous period plus credit growth. That is:

$$E_t = Y_{t-1} + Cr_t \quad (5.3)$$

where Cr_t is the growth in the money supply from bank credit to both the public and private sectors at time "t".

The floating exchange rate system ensures that international receipts and payments are equal at all times. As this example includes international capital inflow, imports equal exports plus net foreign capital inflow:

$$M_t = X_t + K_t \quad (5.4)$$

where K_t is net foreign capital inflow at time "t".

Net foreign capital inflow is assumed to be speculative. That is:

$$K_t = (e^* - e_t) K^* \quad (5.5)$$

where e^* is the exchange rate at which foreign net capital inflow would cease to enter the country; and
 K^* is a constant.

National income comprises domestic sales plus exports. Therefore, as in Appendix 4, national income can be defined as:

$$Y_t = E_t - M_t + X_t \quad (5.6)$$

From equation (5.4), we know that net foreign capital inflow is equal to imports less exports. Therefore, equation (5.6) may be written as:

$$Y_t = E_t - K_t \quad (5.7)$$

Substituting in equation (5.3), for national expenditure, into equation (5.7), allows us to express economic growth as:

$$\begin{aligned} Y_t &= Y_{t-1} + Cr_t - K_t \\ Y_t - Y_{t-1} &= Cr_t - K_t \end{aligned} \quad (5.8)$$

Hence, credit growth provides an opportunity for a country, - using the floating exchange rate system and with a net foreign capital inflow, - to grow. However, this growth will continue only while credit growth is greater than net foreign capital inflow. When foreign capital inflow equals credit growth, the economy ceases to grow.

Appendix 6

Appendix 6, like Figure 12, illustrates the case of a country, using the floating exchange rate system, that has a net international capital outflow but no credit growth.

Exports are given as:

$$X_t = \frac{X_f}{e_t} \quad (9.1)$$

where X_t is exports at time "t" in terms of domestic currency;
 X_f is exports in terms of foreign currency; and
 e_t is the exchange rate at time "t".

Imports are:

$$M_t = e_t m E_t \quad (6.2)$$

where M_t is imports at time "t";
 m is the average propensity to import (when $e=1$); and
 E_t is national expenditure at time "t".

National expenditure is defined as national income in the previous period less net capital outflow. That is:

$$E_t = Y_{t-1} - K O_t \quad (6.3)$$

where $K O_t$ is net international capital outflow in time "t".

The floating exchange rate system ensures that international receipts and payments are equal at all times. Therefore, exports equal imports plus net international capital outflow:

$$X_t = M_t + K O_t \quad (6.4)$$

National income is made up of sales of domestic products on the domestic market and exports. Sales on the domestic market are equal to total national expenditure less imports. Therefore, national income can be put:

$$Y_t = E_t - M_t + X_t \quad (6.5)$$

Hence, substituting equation (6.4) into equation (6.5) reveals that national income equals national expenditure plus net foreign capital outflow:

$$Y_t = E_t + K O_t \quad (6.6)$$

Substituting equation (6.3), that defines national expenditure, into equation (6.6) reveals that national income is unaffected by net foreign capital outflow:

$$Y_t = Y_{t-1} - K O_t + K O_t$$

$$Y_t = Y_{t-1} \quad (6.7)$$

Although the economy does not grow, it has current account surpluses and accumulates foreign wealth. Despite the international capital outflow, it does not experiencing any decline in national income.

Appendix 7

Appendix 7, like Figure 13, illustrates the case of a country, using the floating exchange rate system, that has a net international capital outflow and credit growth.

Exports are given as:

$$X_t = \frac{X_f}{e_t} \quad (7.1)$$

where X_t is exports at time "t" in terms of domestic currency;
 X_f is exports in terms of foreign currency; and
 e_t is the exchange rate at time "t".

Imports are:

$$M_t = e_t m E_t \quad (7.2)$$

where M_t is imports at time "t";
 m is the average propensity to import (when $e=1$); and
 E_t is national expenditure at time "t".

National expenditure is defined as national income in the previous period plus credit growth less net capital outflow. That is:

$$E_t = Y_{t-1} + Cr_t - Ko_t \quad (7.3)$$

where Cr_t is the growth in the money supply from bank credit in time "t"; and
 Ko_t is net international capital outflow in time "t".

Exports equal imports plus net international capital outflow:

$$X_t = M_t + Ko_t \quad (7.4)$$

National income is made up of sales of products on the domestic market and exports, so that:

$$Y_t = E_t - M_t + X_t \quad (7.5)$$

Substituting equation (7.4) into equation (7.5) gives:

$$Y_t = E_t + Ko_t \quad (7.6)$$

Substituting equation (7.3) into equation (7.6) reveals that credit growth increases national income while it is unaffected by the net foreign capital outflow:

$$Y_t = Y_{t-1} + Cr_t - Ko_t + Ko_t$$
$$Y_t - Y_{t-1} = Cr_t \quad (7.7)$$

Thus, credit growth in this economy increases national income as well as the money supply. The capital outflow ensures that the economy has a current account surplus and accumulates foreign wealth.
