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THE AUSTRALIAN FOREIGN DEBT DEBATE
Craig Applegate
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G.P.O. Box 4, Canberra 2601, Australia
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Executive Summary

This paper assesses the Australian debate about private sector foreign debt. Pitchford argues that private sector foreign debt is efficient unless it imposes an external cost on other borrowers. Arndt explicitly criticises the Pitchford thesis, while Gruen concludes that the real exchange rate is overvalued, thus implying that Australia's external position does matter. This paper argues that the inclusion of non-traded goods into models of debt are a diversion away from the key question as to whether private sector debt imposes an external cost.

Arndt's criticism of Pitchford is found to rely on imperfect foresight. Imperfect foresight requires an uncertainty model for analysis and raises the possibility of default on debts. If Arndt's argument is analysed using a certainty model, then it fails to bring doubt upon the Pitchford thesis.

Gruen's concern about Australia's high real exchange rate is found not to follow from his model.
The Australian Foreign Debt Debate
Craig Applegate

Introduction

Pitchford (1989 a,b,c: 1990 d: 1992 e,f) argues that choices which increase private sector foreign debt are efficient, unless they impose external costs on other borrowers. Even if private sector foreign debt does involve an external cost, Pitchford argues that there would be more direct and effective ways of countering this externality than through the use of macroeconomic policy (for example, tight monetary policy). If there is an external cost associated with debt, then the most direct means of countering this would be to impose a tax on borrowing.

Pitchford (1989 a,b,c: 1990 d: 1992 e,f) analyses foreign debt in the context of full employment. Macroeconomic policy is assumed to have no effect on aggregate employment. If the borrowing country is small compared to the international capital market, then there are no sources of market failure. This implies that the optimal policy is not to intervene. If the borrowing country is large compared to the international capital market, then the optimal policy is to apply a tax on foreign borrowing which equals the difference between the marginal cost of foreign capital and the average cost of foreign capital.

Pitchford uses two different types of model to demonstrate his point. The first type makes the distinction between traded and non-

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traded goods, while the second only allows for one traded good. This paper examines whether this distinction between traded and non-traded goods which is made in these models is significant when analysing the issue of foreign debt. I find that the inclusion of non-traded goods in models of debt (or differentiating between a home and a foreign good) is a diversion away from the key question as to whether private sector debt imposes an external cost.

This paper then goes on to analyse the arguments of several critics of the Pitchford thesis. These include: Arndt (1989), Fahrer (1990), who argues that the Pitchford thesis may not hold when the real exchange rate is sticky, and Gruen (1991).

Arndt believes that the economy may be incapable of adjusting net exports fast enough to allow foreigners to successfully repatriate whatever amount of capital they choose. Arndt's criticisms of Pitchford implicitly rely on the presence of imperfect foresight. Policy makers are assumed to have better foresight than private agents. Imperfect foresight requires an uncertainty model for analysis and raises the possibility of default on debts.

Fahrer is concerned that a sticky real exchange rate will lead to inefficient consumption choices between the home and the foreign good. I find that such concern doesn't follow from his assumption that sticky savings behaviour drives the slow adjustment in the real exchange rate.

Gruen implicitly questions the Pitchford thesis when he concludes that the real exchange rate is overvalued. I argue that Gruen's concern doesn't follow from his model, in which the only distortion is a nominal tax system which leads to over investment when inflation is positive.
Is the Traded/Non-Traded distinction important in determining the optimal response to foreign debt?

Most macroeconomic models split production into either traded and non-traded goods or between a home produced good and a foreign produced good. A lot of the criticism of the Pitchford thesis assumes that there is a fundamental distinction either between traded and non-traded goods, or between the home good and the foreign good. The critics appear to believe that a dollar's worth of the traded good (or the home good) is worth more than a dollar's worth of the non-traded good (or the foreign good).

Pitchford [a] uses a full employment model with intertemporal utility maximisation which contains both traded and non-traded goods. In this model, there is no investment and any current account deficit simply results from the personal marginal rate of time preference of a representative individual being higher than the world interest rate. Borrowing occurs until the personal discount rate falls to equal the world discount rate. Pitchford assumes that the market for non-tradable goods always clears.

In Pitchford [a], national income varies with the net income from overseas assets, while national output is fixed. National expenditure is merely national income plus new net borrowing. Pitchford assumes the real exchange rate (defined as the price of traded goods in terms of non-traded goods) will vary until it equilibrates the supply of, and the demand for, non-traded goods. This means that the real exchange rate adjusts to let in the required amount of capital. If there is an increase in expenditure on non-
traded goods, the relative price of nontradable goods rises in order to get rid of any excess demand. As the economy is at full employment, additional expenditure is equivalent to additional borrowing. All the additional expenditure, thus spills over into tradable goods and is financed by capital inflow. There is no market failure in either the market for non-traded goods or the market for traded goods.

In the first two sections of Pitchford [1], two optimising models are used, each of which contains only one good. This good is tradable. One good models contain no relative price and are thus incapable of analysing issues dealing with the real exchange rate. However, one good models suffer no disadvantage when used to analyse foreign debt.

These models map out the optimal time paths for consumption and investment. The analysis for consumption is taken from Pitchford's [b] analysis. The use of optimal time paths is a more complex analysis than is necessary if we only wish to ask the question as to whether foreign debt can result in an external cost. If we restrict ourselves to this question, then the first model simply shows how utility maximising consumers make optimal choices, while the second model shows how investment will be optimal given perfect foresight and the absence of market failure. Investment occurs until the marginal rate of return equals the marginal cost of capital, assuming that the borrowing country imposes an optimal tax on international borrowing. For a country that is a small borrower in the world capital market, the marginal cost of overseas funds equals the world interest rate and the optimal tax is zero.
If we abstract from the time path considerations of these models, then optimal saving and investment are easily combined into one full employment model.

Like the two good model, the one good model assumes full employment. Full employment models can't be used to analyse the relative effectiveness of deliberately inducing a recession as a means of dealing with any external cost associated with private sector foreign debt. This is because demand management policies can't induce recessions with these models.

Both of the above full employment models can be used to illustrate the Pitchford Thesis. In the model with both traded and non-traded goods, a current account deficit reflects intertemporal optimising by consumers. In the one good model, a current account deficit can also reflect investors maximising the discounted value of their wealth.

There is no substantive analytical difference between Pitchford's two good and one good models. This is because Pitchford assumes that the market for non-traded goods always clears.

The Differences between Pitchford and his Critics

Arndt has criticised the Pitchford thesis while Faher states that the Pitchford thesis could be wrong if the real exchange rate is sticky. Gruen argues that the real exchange rate might be too high. Gruen's concern implies either that the external accounts (including presumably private sector foreign debt) matter, or that consumption choices between the home good and the foreign good are distorted. Arndt (implicitly) and Gruen (explicitly) use standard
macroeconomic models which are not based on intertemporal utility maximisation. These models do make a distinction between either traded and non-traded goods or the home good and the foreign good. Gruen explicitly makes an allowance for a domestic currency. This means that interest rates denominated in the domestic currency can differ from the world interest rate denominated in a non-inflationary currency. However, the assumption of perfect capital mobility means that domestic interest rates don't matter.

Arndt's critique of the Pitchford thesis.

The article by Arndt is descriptive in nature and involves no explicit model. Arndt makes three substantive criticisms of the Pitchford thesis, although these have been made without explicit reference to the models developed by Pitchford. Arndt also makes other criticisms of Pitchford that are based on an incorrect definition of an external cost.

Firstly, Arndt says that Pitchford makes no allowance for the social costs that are involved from shifting production from non-traded industries into traded industries. In Pitchford's model, prices are assumed to be fully flexible and there are no costs from shifting production from non-traded goods and services into traded goods and services. A real depreciation will have no effect on either aggregate output or on efficiency. A real depreciation can redistribute income between the owners of different factors. We are justified in abstracting from redistributive effects of depreciation if we are interested in determining whether foreign debt can impose a cost on the economy as a whole. However, a redistribution of welfare may be
seen to be undesirable, even if it involves no decline in aggregate welfare. Arndt's argument is similar to arguing that a fall in the price of coffee is undesirable because it results in a redistribution of income. Before making such a statement, we would want to know how real income was going to be redistributed.

Secondly, Arndt says that Pitchford doesn't allow for inappropriate demand management policies to be a cause of the current account deficit. This is because macroeconomic policy plays no role in Pitchford's model due to the assumption of full employment. I disagree with Arndt's criticism, because he doesn't make a case as to why the problems of internal and external balance shouldn't be treated separately with macroeconomic policy being directed towards the former.

Arndt's third criticism of the Pitchford thesis derives from the view that there is an important distinction between traded and non-traded goods. This distinction implies that Australia has to allocate a sufficient proportion of its investment into tradable industries in order to earn the foreign exchange to pay its way out of foreign debt.

Arndt believes that if the foreign investment occurs in the nontradable sector, then when investors choose to repatriate their profits, a depreciation may be necessary in order for the foreign exchange to become available. If, at some stage in the future, the net supply of capital to an economy dried up, then there would have to be an increase in net exports. In a full employment economy, an increase in net exports would be achieved through a real exchange rate depreciation. Arndt views the possibility of a future depreciation as being undesirable.
With perfect foresight, the trade balance will adjust to allow for the desired level of capital flow. The operation of the domestic capital market will redirect funds towards the investments that earn the highest return. Even if the initial foreign investment occurred in the non-tradable sector, then domestic investment could be displaced to the tradable sector. This will make the net result the same as if the initial foreign investment had originally occurred in the tradable sector.

In the real world, different investors might have a comparative advantage in different industries. For example, a firm may have experience in the construction industry which enables it to get a higher return than other investors in the construction industry. There may then be an efficiency gain from foreign investment being directed towards the non-traded sector, if this is where the foreign firms have a comparative advantage.

Arndt's geographical division between Australia and the rest of the world isn't the only division that can be made when talking about capital flows. If money is lent from N.S.W. to finance a project in Tasmania, then only the present value is relevant in determining whether the project is viable. The industry doesn't have to export a product back to N.S.W. for the firm to be profitable. It doesn't matter where investment capital, be it in the form of loans or equity, is sourced from.

People don't suggest that investment from Germany should be able to pay for itself through exports to Germany. Neither do they suggest that when assessing a German financed investment project we should determine whether domestic investment will be displaced in order to provide net exports to Germany. It then follows that when
assesing foreign borrowing in a certainty framework, policy makers need not be concerned about the production of tradables which is necessary in order to service that investment. In a model with clearing markets and perfect foresight, this will happen automatically. To reach his conclusions, Arndt must therefore have dropped one of these assumptions. It is true that if the net capital inflow into Australia falters, then there has to be an increase in the net production of tradables. In a traded / non-traded full employment model, this will occur through a depreciation of the real exchange rate. In a one good perfect foresight model, there are no limitations on transferring capital out of the country.

It is possible that net exports will not be responsive to the real exchange rate. If the economy was incapable of restructuring fast enough in order to allow foreigners to successfully repatriate whatever amount of capital they chose in the future then, if we restrict ourselves to a certainty model, the loans wouldn't have been made in the first place. It wouldn't matter whether the investment occurs in the tradable or in the nontradable sector, as the loans will always be repayed.

If the above analysis were extended in order to allow for imperfect foresight, then creditors may not be able to recall their loans at once, due to an inadequate ability of the domestic economy to adjust net exports.

The higher is net indebtedness, the greater is the probability of this inability to adjust and the greater is the risk premium that may be applied on loans to the country as a whole. The probability of the domestic economy being unable to adjust in time to meet a net capital outflow would also be higher, the more liquid are the assets
that the foreign investors hold. One person's borrowings could effect the ability of the economy to service another person's borrowings. I would agree that an inability of the economy to adjust net exports could result in an external cost. I don't believe that the government has a sufficient informational advantage over private agents to be able to intervene effectively in order that foreign investors in Australia are always able to retrieve their investments.

The three other criticisms that Arndt has made of the Pitchford thesis are as follows :-

Firstly, he asserts that the situation where debt service repayments outweigh capital inflow involves an external diseconomy. He doesn't explain why this is the case. Secondly, he states ( again without explanation ) that consumption spending involves an external diseconomy. Arndt's final criticism of the Pitchford thesis rests on the belief that the conversion of Australian dollars into foreign exchange involves an efficiency loss.

Gruen's Analysis.

Outline

Gruen (1991) uses an open economy ISLM model with perfect capital mobility along the lines of Buiter and Miller (1981). There is one domestic good and a foreign good. Gruen defines the real exchange rate as the relative price of the foreign good in terms of the domestic good. The price level is measured in units of the home good and is assumed to be unaffected by changes in the exchange rate.

In Gruen's model, the aggregate nominal supply schedule of the home good is assumed to be moving upwards at a rate equal to the growth in the rate of domestic money supply. The rising equilibrium
price can be easily rationalised by assuming that nominal wages are indexed to the growth rate of the domestic nominal money supply. Inflation is positively related to both real national income and the growth rate in the domestic money supply.

Gruen explicitly allows for exchange rate risk which isn't covered in the Pitchford article. This is because Pitchford's model, which contains both traded and non-traded goods, is a real model in which the domestic currency plays no role. As Gruen assumes that the overseas price level is stable, I will measure real interest rates using units of the foreign currency. The twin assumptions of perfect capital mobility and risk neutrality mean that domestic expected real interest rates as measured in the foreign currency are exogenously fixed.¹

¹ The Peso problem occurs when the probability distribution for movements in the domestic currency are skewed so that there is a small probability of a large depreciation in the local currency and a large probability of no change in the exchange rate. When combined with domestic inflation and a nominal tax system, this can result in a distortion that reduces investment below its efficient level.

If the Australian dollar suffers from a Peso problem as argued by Smith and Gruen, then money invested in the local currency will usually earn higher ex-post returns than elsewhere, even after allowing for exchange rate movements. This occurs despite the ex-ante expectation by risk neutral foreign investors that the same returns will be earned through investing in Australian dollars as elsewhere. For example, 4 years out of 5, the investor in $A gets 1% more than the investor in $US, but in the 5th year, he gets 4% less.

The only distortion in Gruen's model is the ability to deduct nominal interest payments on investment as they accrue, while taxing nominal capital gains only on realisation. If the firm borrows in offshore currencies, then the interest payment when measured in the domestic currency is smaller for a given sized loan, but there is an expected capital loss. The size of the loan measured in Australian dollars is expected to increase with the depreciation of the Australian dollar. If the tax system allowed for borrowers to write off the expected losses due to depreciation, then it makes no difference to Australian companies whether they borrow in either Australian or overseas currencies.

In practice, if the firm borrows in overseas currencies, then only the actual losses due to depreciation can be written off rather than the expected losses due to depreciation. If the Australian dollar suffers from a peso problem, then there is a small chance of a large depreciation of the Australian dollar. In this case, risk neutral companies borrowing in overseas currencies have a small chance of being able to make a large tax deduction. The borrowing firm may be unable to make full use of the tax deductability of interest payments due to inadequate profits in any given financial year. They may also be unable to carry these deductions forward in the offset against future
Gruen assumes a domestic tax system that isn't neutral with respect to inflation. Fane (1991) demonstrates that this leads to inefficiently high levels of investment when inflation is positive.

The tax system doesn't tax the growth in the nominal value of a real investment asset until that asset is disposed of. Only the returns from that asset are taxable. This differs from the tax treatment of the loan used to finance that investment. The entire value of the interest payments on the loan can be claimed as a tax deduction, rather than just those interest payments which are in excess of inflation. The ability to delay the payment of taxes through holding a durable asset financed through nominal debt, provides a subsidy to investment. This is because the tax bill rises with the inflation rate, rather than the nominal interest rate which is the opportunity cost of money.

A tax system in which nominal gains are taxed on realisation and nominal interest is deductible on accrual will lead to a subsidy

profits. This creates a bias in favour of borrowing in the domestic currency which would push up domestic interest rates. The Australian dollar would rise until the expectation of a depreciation equalises the expected return to investing in different currencies.

A second way in which tax deductibility is inadequate is through the foreign tax system. If realised (as opposed to expected) losses due to depreciation of the Australian dollar are tax deductible, then the foreign investor would pay consistently higher taxes on the Australian dollar denominated assets. These high taxes would be interspersed which is interspersed by an ability to make large tax deductions. Again, a risk-neutral overseas lender may not be able to make use of the excess tax deductibility, which would also drive up Australian dollar denominated interest rates.

Overseas lenders would place an expected premium on their Australian dollar denominated lending, while Australian borrowers would be willing to pay an expected premium for Australian dollar denominated borrowing. Australian companies that choose Australian dollar denominated loans would choose an inefficiently low level of investment due to high expected Australian dollar denominated interest rates which are above the shadow price of capital. Companies that choose overseas denominated interest rates also result in an inefficiently low level of investment, due to inadequate expected tax deductibility of interest.
of investment. This subsidy is greater, the longer the investment assets are held.2

In Gruen’s paper, the expected real interest rate is set in the world market and foreigners are risk neutral. In effect, the domestic economy is facing a perfectly elastic supply of investment at the riskless interest rate. The domestic economy is small and the level of domestic borrowing and lending can’t effect the ex-ante expected real interest rate which that country is charged. For this assumption to hold true, we only have to assume that the Australian capital market is small relative to that portion of the world capital market that is internationally mobile.

Given the above assumptions about the domestic tax system, if the domestic rate of inflation is high, then the after-tax real interest rate for investors is low. Any effect that a non-inflation indexed tax system has on domestic saving doesn’t feed through into the cost of investment, again given Gruen’s assumption of perfect international capital mobility. High inflation causes a high real exchange rate. This happens because the addition to aggregate demand caused by high investment will be displaced through a higher exchange rate, as we have assumed full employment. This high real

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2 A nominal tax system will usually only allow historical cost depreciation on investment assets. Gruen’s paper abstracts from considerations of depreciation. It isn’t necessary to allow for depreciation, but if it exists, then it will modify the incentive to over invest and is included here for completeness. Historical cost depreciation, when combined with inflation, is a distortion that will result in an inefficiently low level of investment. If the asset totally depreciates in one period, then the penalty that this imposes on an investor is equal to the tax rate times the inflation rate. This is equal to the subsidy which occurs through being able to claim nominal interest payments as a tax deduction.

If over more than one year for the investment asset to depreciate, then the distortionary tax on investment of only allowing historical cost depreciation will only partially offset the ability to claim the full cost of interest payments as a tax deduction. The combination of a nominal tax system and inflation will still result in a net subsidy to investment.
exchange rate also crowds out net exports. Given the assumption of full employment, there are no deleterious efficiency effects from such an overvaluation, other than that associated with the original distortion. The above situation is analogous to the introduction of an inefficient tax on a good. Such a tax may cause flow on effects in the markets for compliments and substitutes, but there is no cost associated with such flow on effects, unless they worsen or lessen an existing distortion in these markets.

The Expectation of Future Policy Reversals

Gruen postulates that foreign investors correctly believe that there is a chance that the domestic government may at any stage in the future choose to end a steady state inflation through tight monetary policy. If and when the steady domestic inflation ceases, the domestic currency will depreciate. This happens because the anti-inflationary policy is assumed to be combined with a once-off jump in the money supply which causes the domestic interest rate to drop. The domestic interest rate will fall at the same way as inflation, domestic money supply jumps. To offset this chance of depreciation, foreign investors receive a higher domestic interest rate until the anticipated depreciation occurs.

Gruen offers two alternative policies which are equivalent to eliminating inflation:-

The first of these involves the chance of introducing an inflation-neutral tax system. This would eliminate the subsidy to investment and the tax on saving. It would also create excess supply of the home good at the original real exchange rate. A real tax system would result in a jump in the real exchange rate as it is equivalent to eliminating inflation and maintaining a nominal tax system.
The second alternative policy involves the chance of introducing a real interest rate equalisation tax. A real interest rate equalisation tax could take one of two forms, and it is unclear which form is intended in Gruen's article.

Firstly, A tax on capital imports would lower domestic investment and raise domestic saving. If real interest rates are equalised from the borrower's perspective, so that the real after tax interest rate rises to the level where it would be if there is no inflation, then the tax does serve to eliminate the excessive investment. The expectation of the introduction of such a tax has the same effect as the expectation of the government eliminating inflation through stopping the growth of the money supply.

In the more complicated real world, then a tax on capital inflow would be a second best solution to countering an inflation based distortion. In a progressive tax system, different people face different marginal tax rates. The optimal capital import tax would also vary across individuals. After-tax returns on saving and investing will differ. In addition, future inflation rates aren't known with certainty. This means that the size of these individual optimal capital import taxes would be unknown.

The alternative form of a real interest rate equalisation tax would be for the tax to "eliminate the real interest premium earned by foreigners investing in domestic nominal assets." Such a tax would be redundant, as foreigners will always expect to earn the world interest rate, irrespective of what level of tax is imposed.

It is an unusual feature of Gruen's model that if inflation is suddenly eliminated, the nominal (and real) exchange rates depreciate. This follows from his unrealistic monetary policy
assumptions, according to which the elimination of ongoing monetary growth is inevitably associated with a once-over jump in the growth in the level of the money supply, but runs counter to what we would expect in the real world. If nominal Australian dollar interest rates fall, then for a given level of real national income, we can expect the demand for real money balances to rise. This could be achieved either through a jump in the money supply, or a fall in the domestic price level. If neither of these occurred, then real national income has to fall. Gruen assumes that the domestic price level is sticky and that the money supply is made to jump by the Reserve Bank at the same instant that the it announces an anti-inflationary policy. All the parties involved are assumed to believe in the credibility of an anti-inflationary policy which involves a jump in the money supply.

Foreign investors suffer a capital loss at this instant, and the real exchange rate (the price of the foreign good in terms of the domestic good) rises. The domestic price level is assumed to be independent of the exchange rate. The price of foreign currency jumps (ie] the domestic currency falls) and the price level is unchanged. The incentive to over-invest has ended. This increases net exports in order to offset the lower net capital inflow.

It isn't necessary for Gruen's analysis that there be a chance that the government might start pursuing an anti-inflationary policy or introduce an inflation neutral tax system or one of its equivalents, if it is only required that Australian dollar denominated nominal interest rates will be higher than the nominal world interest rate. If the Australian inflation rate is higher than the world inflation rate (assumed to be zero), and there is no chance of this policy being reversed, then there will be a steady depreciation in the nominal
exchange rate. The real exchange rate will be stable and high in order to fund the excessive investment that results from the combination of steady inflation and a nominal tax system. If there is purchasing power parity, then Australian dollar nominal interest rates will be consistently higher than the world nominal interest rate by the amount of inflation.

The chance of a future anti-inflationary policy is, however, necessary in order for real Australian dollar denominated interest rates to be higher than the real world interest rate. Given that the expected interest payments, measured in the foreign currency, are locked down by perfect capital international mobility, high real Australian dollar denominated interest rates merely implies a chance of a real depreciation.

Implications and Extentions

For Gruen's analysis to have implications for the conduct of macroeconomic policy, he must believe that there is something wrong with having either high Australian dollar denominated interest rates or an overvalued real exchange rate.

Gruen says that "the authorities presumably view an overvalued real exchange rate with concern." p 21 and "these relative price signals are an extremely undesirable consequence of the interaction between inflation, a non-neutral tax system and free global capital flows." p 22.

This theme is continued in, Alesina, Gruen and Jones (1991) who suggest that there is something wrong with having high Australian dollar denominated pre-tax interest rates, as they lead the real exchange rate to be higher than is justified by economic fundamentals.
Unfortunately, the term overvalued has normative meanings as well as positive ones. If there is something inherently wrong with an overvalued exchange rate, then a dollar's worth of production of tradables (or the home good) is somehow better than a dollar's worth of production of non-tradables (or the foreign good).

A high real exchange rate is necessary to allow the additional foreign capital in to finance the additional investment which results from having both inflation and a nominal tax system.

I argue that, given the assumptions of Gruen's model, the level of Australian dollar interest rates and the real exchange rate are optimal. Australian dollar denominated real interest rates are only high as long as there is a chance of a real depreciation.

I find that that Gruen's elaboration of Pitchford's model through adding a domestic currency and a non-neutral tax system hasn't added any source of market failure that is directly associated with either a high real exchange rate, high domestic interest rates or with private sector foreign debt. If we don't consider the external benefit which results from an increase in the holdings of real money balances (as Gruen doesn't), then there is also no cost associated with high Australian dollar denominated interest rates.

If the tax system is non-neutral with respect to inflation, the higher is the inflation rate, the lower will be the after tax return on saving. Marginal tax rates on savings differ between individuals. Saving can be responsive to the after-tax rate of return, hasn't been

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3 A reduction in the rate of inflation, and the consequent reduction in nominal interest rates, can result in an external benefit if we use a model that endogenises the holding of real money balances along the lines of Obstfeld(1981). Obstfeld treats real money balances as a good which provides utility. Real money balances are valued but can be provided by the government at zero cost. Increased holdings of real money balances are a direct benefit of lower inflation.
assumed in the Gruen model, if saving is an increasing function of the after-tax real interest rates, then this provides an additional reason why domestic inflation (given a distortionary tax system) is expansionary and leads to a high real exchange rate.

The first-best solution for the government is either to reduce the steady-state rate of inflation (although this could have an offsetting output cost if the model contained nominal rigidities) or make the tax system inflation neutral.

**Fahrer's Critique**

Fahrer has a macroeconomic model with one home good and one foreign good. There is no money in this model and capital is assumed to be perfectly mobile. Saving and the real exchange rate both gradually adjust so as to eventually achieve a target holding of net external assets.

Fahrer's paper is divided into two parts. The first part assumes a market clearing model. The model allows for uncertainty through unforecastable shocks to exports, imports and domestic spending on the home good. If such a shock occurs then default is found to be unlikely. Fahrer assumes the marginal share of domestic spending on the home good equals 0.6 and that savings actually do tend towards desired savings. These two assumptions mean that the economy will reach a stable equilibrium, as long as the real interest rate is less than 280%. If creditors knew that default is possible, then they wouldn't be willing to lend at the riskless international interest rate. The supply function of foreign capital would be more complex than appears here.
The second part of Fahrer's paper aims to show that if the real exchange rate is sticky then it will, at times, be inappropriate. A wrong real exchange rate leads to a distortion in the relative price of the home and foreign goods which will result in a welfare loss. Alesina, Gruen and Jones (1991) also suggest that an inefficient foreign exchange market can lead to an inappropriate real exchange rate. Fahrer finds that there is a role for fiscal policy through public expenditure on foreign produced goods in rectifying an inappropriate real exchange rate.

There is nothing wrong with the idea that an inefficient foreign exchange rate will lead to inappropriate consumption choices between the home and foreign goods. However, Fahrer's model is driven by sticky saving rather than a sticky exchange rate. Savings are assumed to move asymptotically towards desired savings. Desired savings are determined in the same way as in the market clearing model. In Fahrer's model, the sticky response of saving drives the slow response of the real exchange rate, rather than the other way around.

Fahrer has a loss function in which welfare falls in proportion to the difference that a sticky exchange rate has on the consumption of both the home and foreign goods. This is an inappropriate loss function, as the changing relative price of traded and non-traded goods is merely a spillover effect of the constraint on saving. An appropriate loss function would be the difference between the marginal valuation and the marginal cost of saving multiplied by the distance of this saving from its optimum level.

An inefficient constraint on purchases of clothing will lead to a welfare loss in the clothing market. It may change the relative prices of other goods but this will not involve any welfare implications,
unless the tax on clothing expands or lessens an existing distortion in these other markets. The spillover effects of a restriction of saving away from its optimal level has no effect on any existing distortion, as the model doesn't assume that any such distortions exist.

The appropriate role of first-best policy in such a model would be to remove any restriction which stops people achieving their desired level of saving. This would be possible as the exchange rate isn't actually sticky in this model. Exogeneous changes in spending, such as through macro policy, will change the level of desired saving. Actual savings equal previous savings plus a proportion of the difference between desired and actual saving. Macroeconomic policy can have no effect on actual saving, except through changing the desired net holdings of foreign assets and thus net saving. Changing consumer tastes isn't a means of eliminating an externality. Macroeconomic policy, thus, has no role to play in producing the desired level of private sector saving.

**External Costs which can arise from Default risk**

If we moved from a model without default risk to a model which explicitly allows for the possibility of default, it is private sector foreign debt can feasibly impose an external cost on other residents of a country. This could occur along the lines mentioned in the previous discussion on Arndt who implicitly makes an allowance for default risk. Arndt believes that a fall in the real exchange rate, which would result from a decline in net capital inflows, may not achieve the necessary offsetting increase in net exports.
There are two additional mechanisms through which private sector debt could result in an external cost. These two additional sources of an external cost are addressed in Applegate (1992).

Firstly, an external cost could occur if there is a possibility that the government will intervene to prevent the private sector from repaying its own debts. A wealth maximizing government will prevent net repayments when the size of such repayments exceed the random penalty which would be imposed on the government (and hence the residents of the country) for enforcing private sector default. The higher is private indebtedness, the greater is the chance that the government will impose such sanctions, and the higher is the expected value of the penalty faced by the risk-neutral citizen. Private sector debt can impose an external cost through the expected value of this penalty.

Secondly, an external cost could occur if foreign creditors can pressure governments to take responsibility for unguaranteed private sector debts. Diaz Alejandro (1985) shows that foreign creditors successfully applied such pressure in order to get the Chilean government to guarantee its deregulated financial sector.

Conclusions

Abstracting from depreciation allowances, there are two deadweight losses which can result from a tax system which allows the nominal growth in assets to be taxed on realisation, while interest payments are tax deductible on accrual. The first, along the lines of Gruen, means that tax deductability of the nominal cost of business loans leads to inefficiently high levels of investment. The
second, examined in footnote 1, arises from the assumption of both a Peso effect for the Australian dollar and an inability to carry over excess tax deductions from one year to another. The combination of an inadequate realised level of tax deductability of Australian firms borrowing in an overseas currency along with the excessive level of taxation on overseas investors lending in Australian dollars, means that there is a downward distortion in the amount of investment that takes place.

No external costs arise from the above distortions leading to a high real exchange rate and a resultant reduction in net exports. There is also no external cost associated with a real exchange rate which adjusts slowly as a result of sticky savings behaviour. In this case, policy should be aimed at relieving the unexplained restriction that stops saving from reaching its desired level.

This paper argues that the models used by those who argue that private sector foreign debt is a problem, essentially reduce down to Pitchford’s traded / non - traded model. Fahrer and Gruen have yet to successfully rebut the Pitchford thesis. In order to question the Pitchford thesis, these models need to include the possibility of default, as Arndt does implicitly. Foreign debt can result in an external cost, if there exist conditions under which the government will intervene in the repayment of private sector debt.

As Pitchford argues, any cure should be aimed most directly at the cause of the externality, rather than focussed on the result of the externality. When trying to prevent a murder taking place, it is better to prevent the gun being fired than to legislate against smoke, only some of which is a byproduct of murder. Only part of a current account deficit would be able to be attributed to the combination of
high domestic inflation and a nominal tax system or sticky saving behaviour.
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