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An Independent Scotland's Currency Options Redux: Assessing the Costs and Benefits of Currency Choice

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CESIFO WORKING PAPER NO. 4952

SEPTEMBER 2014

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JEL-Code: F31, F32.

Keywords: Currency Regimes; Economics of Scottish independence.

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Media embargoed until midnight 10 September 2014.

**An Independent Scotland's Currency Options Redux: Assessing the Costs
and Benefits of Currency Choice**

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A non-technical resume:

- This paper demonstrates that all of the currency options available to an independent Scotland come with the price tag of an austerity programme. This is due to the need to accumulate foreign exchange reserves.
- The only currency option that maximizes the benefits and minimizes the costs of independence is that of a separate currency. All of the other options have none of the benefits but even greater costs than the separate currency option.
- The ball-park cost of setting up a separate currency, purely in terms of the foreign exchange reserves required, is a minimum £40bn. This is the sum of money similar sized Nordic countries - such as Denmark, Norway and Sweden - need to run a variety of different independent currency regimes, from a float to a fixed rate, and a managed float.
- In this paper we demonstrate that an independent Scotland, even including oil revenues, will have a balance of payments deficit of between 2-5% on its current balance; that is around £6bn. An independent Scotland is also projected to have a budget deficit of 5% of GDP.
- Taken together these so-called twin deficits indicate that to have a separate currency an independent Scotland would need to run a fiscal austerity programme in terms of having a budget surplus of 5% of GDP just to balance the external books. To gather in the sums of money needed to run an independent currency regime would require an even larger fiscal surplus, perhaps up to 10% of GDP.
- The Belgium Luxembourg Economic Union (BLEU) is given as an example of how Plan A might work. However the BLEU does not remotely resemble the sterling zone monetary union, future or present. There were no less than three changes in the exchange rate relationship between Belgium and Luxembourg during its life, they ran a dual exchange rate system with separate exchange rates for current and capital account transactions and a raft of controls on capital and trade run through the banking sector. Neither of the countries was a net exporter of hydrocarbons.
- The retention of a sterling monetary union post-independence - **Plan A** - will not work because it does not allow an independent Scotland to adjust to changes in competitiveness as a result of becoming a petro currency, post-independence.
- Our calculations show that because of the petro-currency effect the competitiveness of Scotland's non-oil export sector will worsen by approximately 7% per annum.
- This loss of competitiveness can only be addressed by a dramatic rise in productivity of around 7% or internal adjustment of wage cuts and a rise in unemployment much as what happened in Greece and Spain recently.
- The competitiveness of firms trading in Scotland will be volatile and uncertain containing the same risks and costs as a separate currency with none of the benefits.
- Since Plan A is now regarded as a transitory arrangement to an alternative currency regime, the government would need to accumulate the £40bn of foreign exchange reserves mentioned above, on top of wage cuts and unemployment.

- Plan A is therefore a recipe for austerity +. Of course, such a policy would be extremely unpopular and the Scottish Government would be forced to abandon the fixed exchange rate relationship with rUK.
- However, history shows that governments cling to fixed exchange rate relationships for too long when underlying competitiveness is changing and this eventually produces a classic currency crisis.
- I estimate that a currency crisis would cost the Scottish taxpayer between £25bn to £35bn and could cost up to £100bn. If a banking crisis followed that could add a further £100bn. The cost to rUK will be much greater. Furthermore, a currency crisis would most likely lead to a further banking crisis which would dramatically increase these costs even further.
- **Adopting the pound informally – Sterlingisation** is without doubt the worst possible currency option for an independent Scotland for a number of reasons. First, since sterling would be a foreign currency a reserve balance of at least £40bn would be needed just to smooth out balance of payments deficits and surpluses. Second, because it is a fixed rate system it could not address competitiveness issues arising from the petro-currency effect. Third, to insure the sterling retail bank deposits held in Scotland would require a further accumulation of reserves of £120bn. Fourth, an independent Scotland would need to float its debt in sterling and need to acquire foreign exchange reserves to back this, another £6bn, or pay ruinously high interest rates in the absence of such backing. This would be austerity ++.
- **Adopting the Euro.** The Euro zone is another form of one-size-fits all monetary policy, similar to the sterling zone, and would not be a suitable currency regime for an independent Scotland. Since Scotland would be a petro-currency it would suffer a loss of competitiveness with respect to other Euro zone member that could not be addressed by a nominal exchange rate adjustments. So, much as in the recent Greek experience, competitiveness could only be maintained by wage / price cuts and higher than average unemployment – an austerity programme. Furthermore, since EU regulations require a country to have a separate currency and central bank before joining the euro an independent Scotland would have to build up the above noted pool of reserve. It is also unlikely to meet the relevant criteria for the government’s fiscal position and total debt provision.
- **A separate currency** is the only option that facilitates an appropriate macroeconomic policy for an independent Scotland. It would give the maximum flexibility in the operation of fiscal and monetary policy and it is the only option that financial markets would find credible. However, given the limited foreign exchange reserves an independent Scotland would inherit, a pure float would need to be run in the initial years of independence, generating considerable uncertainty and risk for trade and investment, although not markedly different to that in a formal monetary union. An austerity programme of budget surpluses would also be required to gain credibility with financial markets and to gather in the required £40bn of foreign exchange reserves to run a managed system. There will be continued turmoil in financial markets until this option is chosen and designed appropriately.

Introduction.

Many have been surprised at the prominence that the 'currency issue' has had in the recent Scottish referendum debate. The reason that currency has been so central is that it is much more than simply the notes and coins in our pockets that is at issue. It is about the whether the currency in circulation is backed by a central bank in a credible way and, critically, how our currency relates to other country's currencies in terms of the degree of fixity. If these important institutional feature of currency are not right then this can have devastating implications for employment output, inflation and a country's competitiveness.

In designing a currency regime or mechanism for an independent country it is critical that the regime offers the country a credible means of adjusting disequilibria – that is deficits and surpluses - on its balance of payments. If it doesn't, and in the absence of a risk sharing agreement/ transfer mechanism it is doomed to fail. This is an important lesson in the economic history of currency regimes that Bordo and MacDonald (2012) emphasise. In thinking about the appropriate currency regime for an independent Scotland it is crucial to have this 'adjustment question' at the back of ones mind.

If Scotland were to become an independent country, and if it were to obtain a geographic share of North Sea oil, which most commentators now seem to accept would be the case, then it would become a net exporter of hydrocarbons. It is well known in the currency literature (see MacDonald and Al Faris (2010)) that in designing a currency regime for a country with a diversified non-oil export sector and an oil sector the crucial role of oil price changes in affecting the competitiveness of the non-oil sector has to be addressed, otherwise the non-oil sector gets crowded out with the implications this has for jobs, output, the sustainability of the balance of payments and interest rates. This is the classic 'Dutch disease' phenomenon. However, in all of the literature on the currency issue that has been generated since the referendum process started, few, including the Scottish Government's Fiscal Commission, even discuss this crucial issue.

The purpose of this paper is to revisit the currency issue and bring out the important themes in the light of the numerous papers that have been written on the topic since the referendum process got underway. One surprising result to emerge from this current assessment is that regardless of the currency regime that an independent Scotland would chose, it is going to need a market credible pool of foreign exchange reserves to run a currency regime. From the evidence of similar sized economies, we estimate this amount to be around £40bn. This amount is around one third of Scotland GDP and is not a sum of money that a newly minted Scotland could borrow on international financial markets, at least not in any sustainable way. The only way that such an amount could be accumulated is through running budgetary surpluses for a number of years. Armstrong and Erbell (2014) have noted that such an austerity programme would need to be run in any case in order to establish the 'hard currency' effect and so the reserve accumulation issue can be seen as reinforcing this effect.

To aid clarity in our discussions, we are going to assume that there is a shadow or virtual Scottish currency, which we call the Scots pound, and a shadow (nominal) exchange rate. This is the currency that would exist if Scotland were to become independent although it can be conceptualised pre- independence as well. The device of a shadow currency is often used, for example, in the speculative attack literature to determine if a chosen currency is appropriate for a country to defend.¹ It is the rate that we can buy and sell foreign currency per unit of home currency. Since we take the remaining UK (rUK) as the main trade competitor of Scotland this is the rate we can buy pounds sterling for in exchange for one Scots pounds. At the moment that rate is set as one-to-one, or parity.

In addition to this nominal exchange rate Scotland also has a real exchange rate which is defined as the ratio of the overall Scottish price level², P^s , to our competitor's price level, P^{uk} , - P^s/P^{uk} . From this it can be seen that if prices were to rise in Scotland relative to rUK, then other things equal, the goods we trade would become more expensive and therefore we would expect the amount we trade in these goods to fall. Conversely, if P^{uk} were to rise, rUK goods would become uncompetitive and we would expect to trade more and our trade position would improve.

Strictly speaking since Scottish goods are priced in Scottish currency and rUK goods in rUK currency we have to define them in the same units using the nominal exchange rate much as we have to do on vacation when we buy foreign goods. This alters the simple price ratio now to: $S \cdot P^s/P^{rUK}$. Scotland is currently part of the sterling monetary union with the other participating countries of the UK. In this arrangement S is rigidly fixed and is set as 1 (virtual) Scots pound to 1 pound sterling. Since S is fixed changes in competitiveness cannot occur through changes in S in a monetary union and by setting it equal to unity we return to the price ratio, P^s/P^{uk} . However, it is noteworthy if S could be changed then competitiveness changes could come through this channel as well as through price changes. Indeed, crucially, if S is free to move it can become a policy tool to offset unfavourable changes in competitiveness brought about by price changes. This is the nub of the issue as to why any form of sterlingisation is not appropriate for an independent Scotland because S is fixed one-to-one and P^s/P^{uk} is moving capriciously with changes in the price of oil and other potential economic shocks.

The ratios referred to above are referred to as a country's real exchange rate and are crucial measures of country's competitiveness. If all of this seems unnecessarily pedantic, it is not. To understand why the debate about currency in Scotland is so important it is important to grasp these simple concepts since it is the key to unlocking the whole debate.

¹ See for example Krugman (1979)

² The overall price level price level may be thought of as the sum of all individual prices in an economy some of which will enter trade and some non traded.

2. Scotland's balance of payments position: Reserve implications and competitiveness issues.

2.1 Trade and current balances and reserve implications³

In recent discussions of the Scottish currency issue there has been much confusion about the appropriate balance of payments measure that an independent Scotland would face. Many commentators take the trade balance as the appropriate measure of a country's balance of payments position. It is not. The relevant balance is in fact the current account balance, CB, which is defined as:

$$CB = TB + NF,$$

where TB is the overall trade balance and NF is net factor payments. In the Scottish case the overall trade balance would include oil revenue. Figure 1 shows Scotland's trade balance excluding and including North Sea oil. The data underlying this figure are taken from the Scottish Government's preliminary calculations of Scotland's balance of payments (Scottish National Accounts Project – SNAP). As can be seen from the figure the non-oil inclusive deficit is in deficit throughout the sample period and on average over the 15 years reported here the deficit was 11.3 per cent of GDP, a very large trade deficit. This is clearly a striking trade deficit. If, however, Scotland were to obtain a geographic share of North Sea Oil post-independence the trade deficit would be transformed into a surplus of around 2.7% of GDP for the same 15 years.

The crucial difference oil makes to the trade account is clearly evident in this figure. It is also evident that although the oil inclusive measure is on average in surplus it is much more volatile than the non-oil measure with, for example, a deficit of around 2% in the late 90's, a rough balance in the mid-noughties and then a larger surplus in the late noughties. As we shall see below, such volatility on trade gets imparted into competitiveness.

In order to get a measure of the current account the non-trade elements have to be added on to the trade figures and at present only very tentative figures exist for these non-trade elements and this only for 2010 (the discussion here draws on Armstrong and McCarthy (2014)). For 2010 there is a net net outflow of factor income of £7.4bn the majority of which comprised a £5.4bn remittance of profits and salaries from North Sea Oil. The Scottish Government do not provide an estimate of transfers but Armstrong and McCarthy (2014) estimate this to be around £0.4bn using a per capita share of UK data.

Given the NSO inclusive trade account was in surplus to the tune of £7.4bn in that period this implies a rough balance on the current account. Note, though, that 2010 was at a point when the trade balance including oil was at a peak. Moving away from this point the oil inclusive trade balance falls to £2.9bn for 2013 the year in which most recent data are available. If we assume profit remittances from oil likely to have fallen in line with this fall and other items remain essentially constant this would give a current account deficit of around 2% of GDP.

³ This section draws on Armstrong and McCarthy (2014).

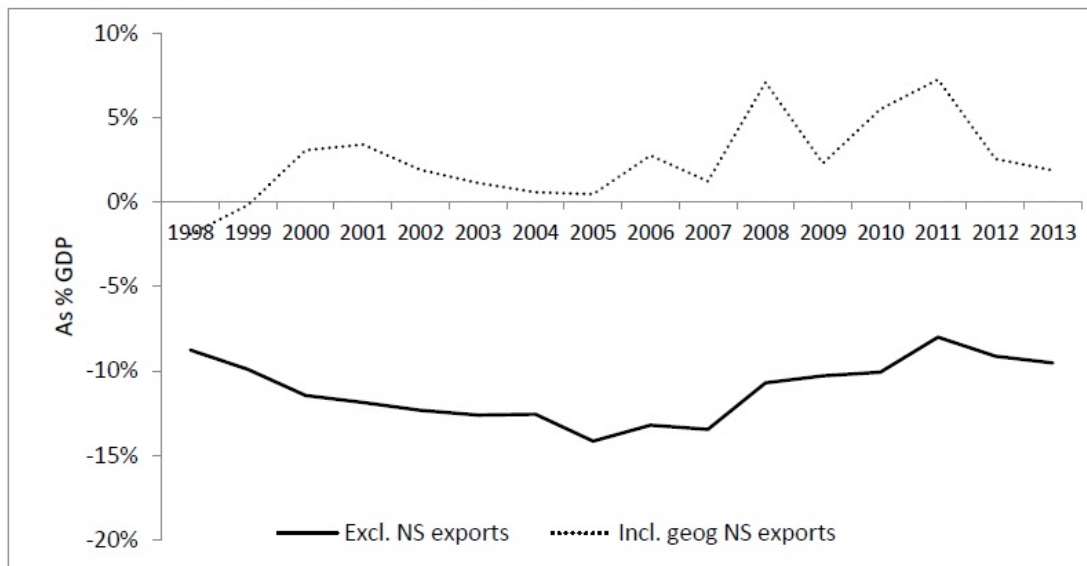
The difficulty in obtaining accurate net transfer data means that a deficit of 2% is unlikely to be accurate. A more direct estimate of what Scotland's current account deficit would be like can be gleaned from the government's fiscal deficit / surplus, since for small open economies, such as an independent Scotland, the government's budget deficit is mirrored in an equal current account position. The net fiscal deficit for Scotland in 2013, including North Sea oil revenues, is 8.3% which would suggest a current account deficit of around 8.3%. The IFS projected fiscal deficit for 2016 is 5.6% which would suggest a current account deficit in that year of around 5-6% of GDP (some independent commentators suggest the deficit could be as high as 7% of GDP). With a GDP of approximately £140bn this would translate into a need for foreign exchange reserves of £7-8bn just to satisfy balance of payments requirements. We return to this point below.

2.2 Trade balances, competitiveness and the real exchange rate.

The two trade balances portrayed in Figure 1 have important implications for an independent Scotland's competitiveness and particularly the competitiveness of its non-oil exports. This is because competitiveness, or the real exchange rate, will be driven by the overall trade balance which includes oil and since this is a surplus it will be appreciating the real exchange rate or worsening competitiveness, because the overall P^s will be rising making exports uncompetitive. However, as we have seen, the trade balance excluding oil is in deficit and this requires an improvement in competitiveness to improve the non-oil trade gap. An improvement in competitiveness could be brought about by a fall in the price of Scottish exports or by a depreciation of its nominal exchange rate if that is free to vary. (i.e. a depreciation of the real exchange rate). We take the gap between the oil inclusive and oil exclusive trade balances as a first approximation of an independent Scotland's competitiveness gap; that is how much competitiveness is being lost by having the price of our exports moving in the wrong direction because of the oil effect.

There are well established empirical links between a country's trade balance and its real exchange rate / competitiveness (see MacDonald (2007) and Lane and Milesi Ferretti ()) Taking the average empirical figure for the relationship between a country's real exchange rate and its trade balance of 0.6 we find that on the basis of the trade data above this would lead to a worsening of the country's competitiveness of 7% per annum on average. This is clearly a big number and would need a roughly offsetting improvement in productivity which is not feasible or wage /price cuts or unemployment. This loss of competitiveness is a direct result of the fact that an independent Scotland would be a petro currency. As we noted in the introduction, a crucial aspect of the design of an exchange rate regime is it should provide an adjustment mechanism to address such competitiveness changes. Do the exchange rate options on offer to an independent Scotland offer it adjustment to such change?

Scotland's Goods and Services Trade Balance (as % of GDP)



Source: Scottish National Accounts Project www.scotland.gov.uk/Topics/Statistics/Browse/Economy

Source: Armstrong and Ebell (2013)

3. The Main Currency Options for an Independent Scotland

The main currency options for an independent Scotland are by now well rehearsed and we will only give a relatively brief account of them here. There are three forms of sterlingisation – using the pound in some form - that have been discussed, one as a Plan A, and one strongly hinted as a potential plan B. All of these can be thought of as forms of fixed exchange rates where the implicit Scottish pound referred to earlier is tied on a one-to-one basis with sterling with no movement in S , the nominal exchange rate, possible. The two remaining options are to join the Euro zone or to have an independent currency and to for one of the many option that this would facilitate between a hard fix and a purely floating exchange rate.

The most widely discussed form of sterlingisation is in the form of the retention of the sterling monetary union that currently exists within the UK, and this is the Scottish Government's preferred currency option – it's so called plan A. Clearly such a system could only come about by agreement between both parties since in becoming independent an independent Scotland would have left the institutions of the UK, including the Bank of England and the Sterling exchange rate or monetary mechanism. However, even if such an agreement could be reached it is clear from what we have said above that such a system would not offer any adjustment assistance in terms of nominal exchange rate flexibility to address the on average 7% loss of competitiveness per annum.

Furthermore, the euro experience has made clear that absent a political union a monetary union can only work with a banking union and fiscal union. The Scottish Government have clearly ruled the latter out since its Ministers have repeatedly stated they would want 100% fiscal flexibility in such a monetary union. With the refusal of all of the main political parties to allow Scotland to continue participation in the sterling zone, the First Minister of Scotland and other Scottish ministers have repeatedly said that they intend to renege on their fair share of the UK's national debt. However, the apparent dawning that this would not give an independent Scotland any

of the assets of the sterling union, such as foreign exchange reserves and actual sterling cash, which they would need to run any form of exchange rate system seems to have made them modify their position and focus on the financial assets themselves. After bailing out the main Scottish banks it is unlikely that rUK taxpayers would be prepared to underwrite such a system. But even if they did it is still doomed to failure, and at great cost (discussed below), because it does not provide an effective adjustment mechanism to deal with the petro currency effect.

An alternative to a formal currency union would be to adopt the pound anyway, much as Panama adopts the dollar, Montenegro the euro etc. For obvious reasons economists refer to such a set up as a currency substitution system. Such a system is viewed as inherently unstable because it is subject to the whims of individual's expectations and the effects that these can have on the demand for money which can lead to changes in the supply through the balance of payments. In a full sterlingisation model, that is one in which only sterling circulated, and there was no central bank function, there would be no control over the money supply in an independent Scotland and no lender of last resort function (see Armstrong and McCarthy (2014) for an extensive discussion of this variant of sterlingisation).

This is because changes in the current account of the balance of payments would directly affect the money supply in the Scottish economy. For example, with a surplus on the current balance this would increase the quantity of sterling in the economy with the inflationary implications this would have. Conversely, a current account deficit would draw money out of the economy with deflationary implications. The flows are exactly the kind of flows that David Hume, a towering figure of the Scottish enlightenment, predicted in his famous price-specie-flow mechanism (see Bordo and MacDonald (2012)). In order to deal with such flows a separate Monetary Authority would need to be set up to smooth their effects on the economy; i.e. by building reserves in times of surplus and running down reserves to limit the contractionary effects of deficits.

However, the evidence from other similar sized economies to Scotland – for example the Nordic countries - is you need foreign exchange reserves of upwards of £40bn. But if the Monetary Authority was prepared to offer deposit insurance to the some £120bn of retail deposit accounts (see Armstrong and McCarthy (2014) on this point) it would need to accumulate reserves of around £160bn? Where would this money come from given the balance of payments of an independent Scotland is going to have a deficit of between 2-5% of GDP and need in the region therefore of £6-7bn just to cover its international obligations. The only way these sums could be achieved would be through a massive austerity programme. The latter would be so big and would create such uncertainty that the banks would simply relocate south of the border in anticipation and probably long before independence day.

The exodus of the banking sector would still leave the Scottish government to gather in the needed £40bn of reserves for balance of payments purposes. Additionally, since government debt in a sterlingised model would have to be issued in Sterling (see Armstrong and McCarthy (2014)) sufficient extra sterling reserves would need to be generated to provide at least some back for this unless the Scottish Government was prepared to pay penal rates of interest as an alternative.

All of the above points focus purely on the monetary implications of the sterlingisation option. Since sterlingisation is implicitly a fixed exchange regime – with our virtual Scottish pound pegged one-to-one with the rUK pound - the underlying loss in competitiveness of the non-oil export sector discussed above would still exist and would imply this is a non-viable system and which for all of the reasons noted above would be one of huge uncertainty and continual crisis.

An alternative form of sterlingisation would be the construction of a currency board in which a domestic currency consisting of Scots pound would be issued in a similar way to today by the commercial Scottish banks and backed at least 100% by sterling which would now of course be a foreign currency. Such a system is usually run by a Monetary Authority, a lesser form of central bank, and it would ensure that the Scottish currency would be freely convertible into sterling at an exchange rate of 1 to 1. Such a system requires a considerable amount of foreign exchange – both cash and reserves to back deposit accounts. To run a currency board as the Hong Kong experience has shown £200bn requires massive foreign exchange rate reserves which, in turn, has required policies of fiscal austerity and balance of payments surpluses. Lender of last resort function. Again the loss of competitiveness issue would not be addressed in this set up and this is not a runner as a currency option unless the Scottish Government is intent on handing over large sums of Scottish taxpayers money to hedge funds and speculators.

Similar to the Sterling zone, the Euro zone is a one-size-fits all monetary union and therefore would present the same issues as before with respect to competitiveness for an independent Scotland. Furthermore, given the serious problems that have arisen in the Euro area countries there are now moving to a system based on banking and fiscal union. The latter, of course, conflicts with the Scottish Government's intention to have 100% flexibility in its use of fiscal policy post-independence. Furthermore, and as things stand, to enter the Euro area an independent Scotland would need first to have its own currency and central bank and demonstrate it can meet certain criteria with respect to inflation, debt and deficit levels and interest rates.

A separate currency is the only option which would give an independent Scotland an effective adjustment mechanism to address the competitiveness issues discussed above and give it maximum use of monetary and fiscal policy: the nominal exchange rate can move to absorb unfavourable shocks. This is the only currency option that financial markets will regard as credible. It would involve setting up a central bank and the issuance of a new currency. Because of the balance of payments issues, discussed above, and the lack of any foreign exchange reserves to speak of post independence, this would need to be a pure float for the initial years of independence.

As is well known floating exchange rates can be extremely volatile particularly in the case of a newly minted country with no track record whatsoever in macroeconomic management. In order to build up confidence and to attenuate the deleterious consequences of such volatility on trade and investment the newly elected government of an independent Scotland would need to implement 'hard currency' policies along the lines of Armstrong and Ebell (2013). Such an austerity policy also be needed to build up sufficient foreign exchange rate reserves of the quantity referred to earlier, and to balance the external books

4. The macroeconomics of exchange rate regime choice: optimum currency areas et al.

What are the factors that make a country's policy makers choose a particular exchange rate regime? From a theoretical perspective, perhaps the best-known guide to this issue is the so-called optimal currency area (OCA) literature (see for example MacDonald (2007), (2013)). The OCA literature considers the following kind of issue. Consider two countries with each country having an independent monetary policy (that is, they have independent central banks, interest rates and exchange rates). The countries are considering relinquishing this monetary independence and forming a monetary union because they envisage efficiencies arising from having one currency rather than two. Specifically, transactions costs are eliminated and these comprise both the costs of changing currency and the elimination of exchange rate risk. This should, in turn, optimize both trade and investment between the two countries and lead overall to greater prosperity (these transaction cost issues are considered in further detail below).

The OCA literature initially focused on criteria such as the degree of capital and labour mobility between the two countries (Mundell (1961)), their degree of diversification in trade (Kenen (1969)), the degree of openness to trade of a country (McKinnon), the similarity in their economic structures, and the availability of fiscal transfers to offset the costs of adjustment. This is normally referred to as the single criterion approach to assessing the optimality of a currency union. So, for example, high degrees of capital and labour mobility, a high diversification in trade and an open economy all point towards a more efficient outcome if monetary independence is ceded and a monetary union formed.

The idea behind this is as follows. If one of the countries faces a fall in demand for one of its key products it is more likely to be able to cope with this if labour and capital can move from this activity to other activities in the monetary area which are more buoyant, without the need for an adjustment of monetary policy (exchange rate/ interest rate changes).

Of course in terms of the Scottish debate the counterfactual is in fact the opposite of the above, with the two countries – Scotland and rUK – already in a formal monetary union and considering leaving the union.

4.1 The Scottish Governments Fiscal Policy working Group.

The Scottish Governments Fiscal Commission Working Group (FCWG) (2013) used the single criterion approach in their assessment of the choice of currency regime for an independent Scotland. For example, they noted that productivity levels were convergent with rUK levels, capital and labour mobility was high between the two areas, trade was high between the areas and economic cycles were aligned with both areas having similar levels of GDP per capita. This evidence of convergence led them to argue that retention of a formal currency union with rUK was the best option for Scotland (and rUK).

However as Taylor and Masson () note a focus on the single criterion approach is very dated and for some time the focus in the OCA literature has turned from these single criterion approaches to an analysis of the shocks affecting economies or regions, since 'shock absorption' is seen to combine the *net* influence of several of the

traditional criteria. There are a number of different aspects to this approach, for example: are shocks symmetric or asymmetric?; are the shocks temporary or permanent?; what are the origins of the shocks – are they supply side or demand side shocks?

In their analysis of Scotland's currency option the FCWG ignores the role of asymmetric shocks which will be extremely important in a post independent Scotland since Scotland will be a net exporter of hydrocarbons and rUK a net importer – changes in the price of oil will have asymmetric effects across the two areas. Furthermore, the whole premise of the FCWG work is that Scotland and rUK are *currently* convergent economies. But would they be convergent post independence? That is unlikely given the endogenous changes that are likely to take place in the Scottish economy with such a significant regime change occurring with independence and of course the Scottish government have explicitly stated that they are going to pursue divergent policies. There can be little doubt therefore that the FCWG's recommendation of the sterling zone is based on a false premises and is therefore fatally flawed.

4.2. Belgium-Luxembourg Economic Union

The FCWG go on to advocate the Belgium-Luxembourg Economic Union (BLEU) as a useful example of how a formal Scottish- rUK monetary union might work. The BLEU existed from 1922 to 1999 and the FCWG claims that this was a currency union and one that allowed both countries to have 'significant differences in corporation tax rates...' However, a closer examination of the BLEU reveals that this is about as unsuitable a comparison to the Scottish case as could be imagined.

During the life of the BLEU, there were three parity changes between Belgium and Luxembourg: in 1935 and 1944 and again in the early 1980's when Belgium became uncompetitive relative to Luxembourg and instead of accepting wage cuts it devalued its exchange rate relative to Luxembourg. No economist would regard a currency arrangement in which parity changes take place as a monetary union since in such a union parity changes are ruled out by definition. Second, the BLEU operated a dual exchange rate system throughout its existence, having a fixed rate for current account transaction and a flexible rate for capital account transactions. In order to make such a system work controls on both capital and trade had to be imposed, largely by the banking system and these controls were strictly enforced to ensure that there was no leakage between the two exchange rates on current and capital (see MacDonald (1988) for an extended discussion of the BLEU). Finally, neither Luxembourg nor Belgium were net exporters of hydrocarbons or any other commodity and therefore faced symmetric shocks which did not require much in the way of competitiveness change.

4.3 Asymmetric Oil Shocks and the Oil Channels

We turn now to a more detailed discussion of the asymmetric shock issue. In this regard the policy response in an oil exporting country (Scotland) is likely to be different depending on the source of the oil shock - supply (exogenous changes in production) or demand (changes in consumption) – to an oil importing country (rUK). For example, in the case of a supply side shock the oil exporting country would probably want to have a tight monetary policy to control inflation, while the oil importing country would want a more expansionary monetary policy to maintain demand for its other goods and services. If supply side shocks predominate this in

itself would provide a convincing case for retaining exchange rate flexibility rather than entering a monetary union. In contrast, if the high price of oil represents a demand shock (i.e. an increased demand from China and India) then the policy response in both the importing and exporting currency should be the same, namely tighter monetary policy. So if demand shocks predominate, this would seem to favour pegging the currency of the oil exporter to take advantage of the benefits of a fixed exchange rate.

It is, of course, often difficult in practice to gauge how much of an oil price change is coming from the supply side or the demand side, just as it is often difficult to gauge how much of a price change is due to permanent forces and how much is temporary (temporary changes would not necessitate the kind of real exchange rate response we have advocated above and therefore would not have implication for the regime choice).

Therefore the key issue or criterion in the OCA literature on deciding whether to fix or to float boils down to whether the shocks hitting the two countries are symmetric or asymmetric. If the shocks are asymmetric, that is they have a differential effect on the two countries, then there may well be an advantage to each of the countries having flexible exchange rates and independent monetary since with such policies, the exchange rate would act as a shock absorber altering the real exchange rate and competitiveness. More specifically, the RUK is a net oil importing country whereas an independent Scotland would be a net exporting country. A permanent or relatively permanent change in the price of oil, whatever its source - demand or supply side - requires an appropriate macroeconomic and exchange rate response.

For example, a permanent increase in the price of oil requires reduced levels of consumption and investment in the oil importing country and a real depreciation of its currency, whereas the opposite should be happening in the oil exporting country: higher levels of consumption and investment and a real exchange rate appreciation. So the basic insight of Mundell's (1961) seminal paper is that two countries with asymmetrical shocks such as Scotland and rUK should not have a fixed exchange rate, but should have some flexibility in their exchange rate behaviour.

With a fixed exchange rate the countries in question have to wait on the appropriate inflationary mix to bring this about and this can be long drawn out and, indeed, by the time an appropriate adjustment has taken place it may be time for the opposite policy response. Having exchange rate flexibility clearly makes this process much easier. Also the above discussion makes clear the considerable difficulties that will arise in a monetary union, such as the sterling monetary union, where the central bank is engaged in inflation targeting. The implications of this are brought out below in a HM Treasury simulation.

The main channels through which an asymmetric oil shocks are likely to affect the Scottish economy are: the terms of trade, direct expenditure effects, and asset market revaluations. The terms of trade is simply a measure of the value of a country's exports in terms of its imports. For an oil exporter, a rise in the price of oil, other things equal, improves the terms of trade implying that the same bundle of imports can be bought for less money. This is seen as an income or wealth effect and there are well known channels, such as a traded / non-traded channel through which this can lead to an increase in the overall prices in an economy and a worsening of competitiveness. It is interesting to note that there is an important asymmetry here in the effect of oil price changes, since although a fall in oil prices would lead to a worsening of the terms of trade this is unlikely in itself to lead to an improvement of

competitiveness since overall price measures, such as the CPI, tend to be sticky in a downward direction. An increase in oil prices will also increase the revenue available to government and also private sector companies related to the oil industry, both of which may increase spending in the form of consumption and investment as a result of the oil price increase. In countries where oil is a major part of GDP changes in oil prices can have an important impact on asset markets such as the stock market and housing market and the Norwegian experience shows that these effects can be important drivers of competitiveness.

4.4. HM Treasury

HM Treasury's (HMT) contribution to the debate on currency is contained in two comprehensive papers (2013 and 2014). In the former paper HMT note that in becoming independent, Scotland would be leaving the UK's key national institutions including the Bank of England and would need to establish its own macroeconomic framework which would of course represent the end of the current fiscal risk sharing arrangements. Furthermore, the paper notes that both institutional and policy divergence between Scotland and rUK would lead to a weakening of economic integration. Given this they then examine the costs and benefits of the various currency regimes referred to above.

Specifically, HMT (2013) draws on the wider OCA literature (i.e. that including asymmetric shocks) to outline the costs and benefits of the various currency options open to an independent Scotland. In sum HMT(2013) argues that a separate currency is the only tenable option for an independent Scotland since this would allow the nominal exchange rate to support the adjustment of the real exchange rate. More generally a separate currency would allow a government facing what would be a more volatile economic structure greater policy flexibility in managing the economy. However, they also note that a new currency would not be without its costs, in terms of higher transaction costs and exchange rate risk, and there is always the danger that a newly introduced currency would itself be a propogater of shocks to the economy rather than absorber of them. Furthermore independent countries of a comparable sized to Scotland, such as the Nordic countries, have only gained credibility in their exchange markets by running fiscal surpluses.

HMT (2014) uses a 4 bloc (Scotland, rUK, the Euro-area, and the rest of the world) New Keynesian model to assess how an independent Scotland would handle various economic shocks in the current sterling monetary/ political union (i.e with risk sharing) and in the context a post independence currency union (with no risk sharing). This is the only study that we are aware of that attempts to quantify the effect of various economic shocks on the Scottish economy and is therefore a valuable exercise, especially since it considers the important role that the Bank of England's inflation targeting policy would have in the transmission of the shocks.

The shocks considered are: a temporary fall in Scottish demand; a permanent fall in non-oil Scottish supply; and a permanent fall in the world price of oil. The analysis shows that an independent Scotland would find it more difficult to adjust to these economic shocks than it would if it remained in a both a monetary and political union. For example, in terms of the oil shock the analysis shows considerable overshooting – i.e. volatility – of an independent Scotland's competitiveness or real exchange rate, which would create considerable uncertainty for Scottish business and would have the

detrimental effects on an independent Scotland's non-oil trade mentioned elsewhere in this paper. The upshot of HMT (2014) is to clearly indicate that an independent Scotland would need a separate currency to address these kind of shocks, especially if all of the adjustment is not to fall on relative prices. The paper also shows that the remaining UK would become exposed to much greater fiscal and financial risk from an independent Scotland participating in a currency union.

Young (2014) examines the three shocks considered by HMT (2014) and assesses them against the main currency options available to an independent Scotland. He finds that a continued currency union with rUK is better for both economies than any of the other options. However, Young only comes to this conclusion by erroneously assuming a continuation of the fiscal sharing regime that exists today. Furthermore, he also seems to ignore the fact that bringing balance of payments adjustment about by changes in the nominal exchange rate is a very different matter to adjustment through wage and price flexibility. Surely the lessons of Spain and Greece are sufficient to demonstrate that that is not the case!

Muscattelli (2014) criticises the HMT (2014) model for being static in nature and therefore ignores factors which could improve the flexibility of wages and prices, such as a change in Scotland's tax structure, its collective bargaining structure and its labour market and welfare policies. However, the static representation is a useful first pass of the likely effects of the considered shocks in a monetary union with inflation targeting. Secondly, even if greater wage price flexibility could be achieved in the longer term these issues would still have to be addressed in the interim as overall prices will remain sticky in the short term in the face of the various shocks that HMT consider.

5. A finance approach to the monetary union issue.

Goodhart (1989) has argued that the large variation in the size of monetary unions means that the theory of optimal currency area has little predictive power in determining if a single currency region will be suitable or not. Indeed, Armstrong (2013) argues that the key element in deciding if a monetary union will be robust or not is the financial infrastructure that underpins it. In this regard Armstrong (2013) sees the provision of liquidity, or lender of last resort, services as the key to providing a robust monetary union between Scotland and rUK.

Given the high level of public sector debt an independent Scotland is likely to inherit there will be a non-trivial risk that monetary union with rUK, if it could be agreed, will break up and capital flight would play a pivotal role in this. Given this Armstrong (2013) considers three options which could prevent capital flight but nonetheless be consistent with a multinational monetary union.⁴

Option 1 would be for an independent Scotland to form its own central bank to provide liquidity services. There would then be an overarching multi-national central bank for a sterling monetary union, with the Central Bank of England and the Central

⁴ Bordo and Jonung (1999) define a national union as a union of states that have a degree of autonomy in the use of fiscal policy and in which a political union defines the border of the monetary union. In contrast a multi-national union is a union between two or more politically separate nations, such as the Eurozone.

Bank of Scotland as its members. However in such a system the UK taxpayer would still have to stump up 90% of the fiscal backdrop in any loss sharing agreement and therefore a means of ruling out moral hazard would have to be found which is probably impossible. The second option would be to join the Eurozone but Armstrong (2013) rules this out as an option since the ECB is not yet a full central bank and its remit as yet does not include financial stability.

The third option considered by Armstrong (2013) is where negotiations between rUK and a newly independent Scotland result in rUK instructing the Bank of England to provide a full range of central bank functions to an independent Scotland, which would mean UK taxpayers would be liable for losses that may occur on a foreign country. To minimize such losses, the Bank of England would need to be the sole regulator in an independent Scotland, in order to rule out moral hazard issues. Second, there would need to be a legal agreement between the UK and the Scottish Government to apportion and losses to the Bank of England which arise in an independent Scotland to Scottish taxpayers. However, in the extreme example where the whole system has to be recapitalised the amounts cannot be known in advance and it would be very difficult if indeed not impossible to construct a legally binding agreement in advance. If none of these options can in fact rule out capital flight the conclusion is you have to have a separate currency.

In considering the appropriate currency options for an independent Scotland Armstrong and Ebell (2013), also jettison the optimum currency based approach referred to above in favour of considering fiscal sustainability issues jointly with the currency issue. A key element in the fiscal sustainability is the amount of debt that an independent Scotland would inherit: about 86% of GDP if the GDP measure includes oil and 101% of GDP without oil. At the heart of their analysis is the concept of a 'hard currency', that is a currency which investors are prepared to hold as a long term store of value. A necessary condition for a currency to be regarded as hard is that the solvency of the sovereign behind the currency is beyond doubt. Solvency, in turn, simply means that assets are worth more than liabilities

Armstrong and Ebell show that the solvency condition of the central bank, in turn, depends on the country's currency regime. Specifically, they demonstrate that countries that are members of a currency union, have high debt levels and issue debt in the currency of the currency union have much higher interest rates than high debt countries which issue debt in their own currency. This is due to the fact that the government's solvency condition, or intertemporal budget constraint, is more restrictive when using another currency rather than its own currency. The main drivers of debt over time in a currency union are debt service costs and the primary surplus. They calculate Scotland's cost of borrowing to be between 72 to 165 basis points over UK borrowing costs.

Given such borrowing costs, Armstrong and Ebell then look at the fiscal consolidation needed to meet the Maastricht criteria of 60% government debt to GDP and 3% on the deficit to GDP ratio. So over 10 year horizon and growth rate of 2% would imply a fiscal surplus of 3.1% each year and a fiscal tightening of 4.5% in 2016-17 and this is seen as lower bound. With an independent currency and a fully functioning central bank an independent Scotland would need to implement a similar stabilization plan in order to convince investors that it intended to reduce its debt

burden significantly by repayment rather than devaluation i.e. minimize a costly debt crisis. However, the key difference with a separate currency is that there would be some macro flexibility in the face of a large negative shock which may prevent a downward spiral of credit risk increases. So the bottom line of the Armstrong Ebell (2013) analysis is with high debt levels the a country such as Scotland would have limited degrees of freedom in the face of an adverse economic shock participating in a monetary union. Additionally to gain a reputation as a 'hard currency' austerity policies would have to be pursued and these would generate the need reserves to run an independent currency.

Harvey and Saravelos (2014) also take a finance approach to the currency regime issue although on a different tack to Armstrong and Ebell (2013). They argue that the unique nature of the sterling union currency union means that neither a unilateral nor multilateral break up would be credible, leaving a negotiated currency settlement as the only viable option. Three justifications are given for the unique nature of the sterling union. First, the UK's monetary arrangements are unitary in nature following on from the UK's status as a unitary state. This means that all banks clear through an indivisible payments system that would require individual banks to break from their settlement accounts with the Bank of England. In contrast in a federal system, such as the Eurozone, a country exit would simply imply its central bank exiting from the Target 2 payments system.

The second aspect of the sterling zone financial system is that it is tightly integrated and highly complex with Scottish banks making up around 25% of the UK's deposit base, in contrast to the Eurozone where the banking of most countries is done within the boundaries of that country. The third factor making the sterling zone unique is that the UK has two overlapping legal systems which would make redenomination of debt after the break up of the currency union difficult as there has been no consistent approach as to when Scots law or English law should be used as the applicable law of contracts. For example, in the case of retail contracts the governing law can be a function of the residence of the counterparty, in other cases the branch and in others the headquarters of the bank itself.

Harvey and Saravelos (2014) go on to argue that the unique nature of the sterling monetary union would have important policy implications for various forms of sterlingisation. The first is that a unilateral exit from the sterling area is in their view impossible because it would cut off Scottish banks from the liquidity of the Bank of England resulting in the redenomination of deposits for all customers of Scottish banks – both those in Scotland and rUK. It would also remove the lender of last resort function to Scottish banks which is a real problem when the costs of liquidating your banks is high, as would be the case in Scotland as they hold little in the way of net external assets.

On other hand this would make it close to impossible for Scotland to unilaterally adopt sterling in terms of the so-called Panama option. This follows because, as we have seen, an independent Scotland would need to run current account surpluses to generate hard currency and given an independent Scotland is likely to have a current deficit it would have to rely on loans from London which may well be uncertain or only obtainable at a high rate of interest, not a good way to proceed for a newly independent currency.

Issuing a new currency would be one way to avoid these problems, but as Harvey and Saravelos and others have pointed out this would require the redenomination the assets and liabilities of Scottish banks which would require considerable long term planning and at least would need to be done prior to the referendum outcome if a currency union is not on offer post independence otherwise expectations of redenomination risk would immediately arise and there would be extreme capital flight from Scotland to rUK.

Harvey and Saravelos conclude by arguing that continuing with currency union would be the least complex and risk option post independence but also recognize that such a monetary union would be suboptimal because Scotland and rUK would no longer satisfy optimal currency criteria post-independence and the currency unions of such divergent economies can easily be broken. As we have argued elsewhere and in section x below, a suboptimal monetary union is not credible to financial markets and will therefore not last leading to a classic currency crisis at great cost to both Scotland and rUK.

6. The microeconomics of exchange rate choice.

The focus of our discussion so far has been on the macroeconomics of currency choice. Since a number of commentators, discussed below, have argued the microeconomic benefits of an independent Scotland staying in a monetary union outweigh the macroeconomic costs, we discuss what the microeconomic benefits are in this section.

The first microeconomic benefit of participating in a monetary union is the transaction cost savings. One of the primary functions of money is to act as a medium of exchange and this medium is subject to a network externality (Buiter (2000)): that is, the usefulness of a medium of exchange increases in the number of other economic agents who accept it in exchange for goods, services and other financial assets. So by eliminating the need for the exchange of one currency for another, a monetary union saves real resources. Of course given that Scotland is already part of a monetary union additional costs would be incurred if it moved to its own currency. Such costs would be one off up front costs that could be substantial at both the wholesale and retail money market levels. Since there is no recent experience of a Scottish currency it is likely that many goods and services would still be invoiced in terms of sterling post-independence.

The transaction costs savings of Scotland's continued participation in the sterling zone monetary are hard to estimate but if we take the euro zone experience as a guide, in its report 'One market, one money' (European Economy, 1990), the Commission of the European Communities estimated the permanent flow of exchange transaction costs savings at about 0.5% of GDP for the 15 member Community as a whole. But this involved the abolition of 14 national currencies and their replacement by a single currency. In the case of Scotland sticking with the sterling zone there is effectively only one currency to consider and so the cost savings are likely to be lower than the 0.5% figure – perhaps in the region of 0.1-0.2%. But the foreign exchange transaction costs savings would need to be augmented by the transaction costs saved in not having to provide financial instruments denominated in the national currency to hedge

exchange risk considerations. For example, in an independent Scotland with a separate currency, an investor would have the ability to switch from Scottish Treasury bills to UK Treasury bills.

The magnitude of the so-called switching costs from sterling to a Scottish currency - the Scots pound – are even harder to estimate. For the UK experience of considering joining the euro, competing estimates differ by one and sometimes two orders of magnitude. The switching costs do not just involve the administrative, legal and hardware cost of redenominating all contracts, changing vending machines etc., but also the psychological costs of having to compute prices with a new numéraire. With boundedly rational individuals, these costs will always be there and are likely to be significant for a country moving to a new currency (Buiter (2000)). See Armstrong and Ebell (2013) for a useful discussion of these switching costs.

The final microeconomic benefit that a common currency achieves is the greater price transparency it creates. Price discrimination and market segmentation are supposedly discouraged when buyers can more easily engage in shopping where they can compare prices as is now common with online shopping so competition is enhanced. Although the costs to Scotland of having a separate currency could well be large and significant there can be little doubt that the dynamic costs of getting the exchange rate regime right would easily dominate the microeconomic costs.

7. The macroeconomic versus the microeconomic costs and benefits.

Young (2013) argues that the micro advantages of a monetary union are dwarfed by the macroeconomic disadvantages for the Eurozone experience in which nations had different attitudes to fiscal and monetary discipline and with different cultures and political traditions come together in a monetary union. In contrast, the microeconomic/ macroeconomic costs - benefits nexus is argued to be very different in a Scotland / rUK monetary union. For one thing, an independent currency, ‘would impose a high microeconomic burden in terms of higher transaction costs and severe disruption of cross border business, that is of the efficient allocation of goods labour and capital across the border.’ Against these important advantages of remaining in a sterling monetary union Young argues that the macroeconomic disadvantages would be small for a number of reasons. First, both Sco and rUK would be constrained to pursue similar macro policies because they are both accountable to similar bodies, such as the political systems, commercial and professional organisations and bar associations. If the Scottish government did pursue different policies to rUK Young argues that labour and capital would simply arbitrage the difference by cross border flows.

Young then goes on to argue that a sterling monetary union would also have superior insulating properties, relative to the other currency options, with respect to common because all of the economic shocks hitting Scotland and rUK would be symmetric shocks. Unfortunately, and as we have noted above, Young fails to mention that Scotland would be a net exporter of hydrocarbons and would suffer asymmetrical shocks with respect to the rUK. As we have noted above, the natural way to deal with such shocks is to have nominal exchange rate flexibility that can handle both upward and downward movements in the price of oil without the need for wages and price to change. As we saw above the oil effect makes competitiveness just as volatile in a

currency union as in a free float because of the oil effect and furthermore it leads to a dramatic loss of competitiveness of around 7% per annum on average.

Muscattelli (2014a and b)) focuses on transaction costs as the key argument in justifying an independent Scotland remaining part of a formal monetary union with remaining UK. Specifically, he argues that since Scotland and rUK would be starting from a position of being a single integrated market, with a high degree of labour and capital mobility, they would be in very different position from that of any two countries in other monetary unions. As a result, transactions costs are likely to have a significant negative impact on both Scotland and the rUK economies if the Sterling currency area is abandoned. In assessing the benefits in terms of lower transactions costs, Muscattelli takes the usual reference point as the introduction of the Euro estimates, given above (0.1-0.2% of GDP (European Commission, 1990)), although he notes that some other reports (HM Treasury, 2003, Carney, 2014) suggest the gains in terms of lower transactions costs for open economies exporting to the Eurozone might be of the order of 0.5%-1% of GDP.

Given these numbers, Muscattelli argues that the gains to Scotland of a currency union are clear, given that around two thirds of Scottish exports are currently to rUK. Muscattelli also tries to get at the cost to rUK business by looking at the share of UK-EU trade flows to Scotland, and to impute transactions costs by taking the 0.1-1% 'Euro' range of transactions costs estimates in relation to UK GDP. Exports from rUK to Scotland are around 40% of UK exports to the EU and 23% of UK imports from the EU (Scottish Government, 2013). This would produce estimates of lower transactions costs for rUK businesses of around £500m from sharing Sterling as a currency. This would scale up to £1bn for the 0.2% estimate, and even £2.5bn+ for the higher cases cited above. The £500m has been used on a number of subsequent occasions by Scottish government ministers.

Muscattelli (2014a) also argued that trade flows between Scotland and rUK would decline with economic losses to the detriment of consumers in both countries. Although estimates vary, statistically robust models of trade flows from the gravity model of Eicher and Henn (2011) estimate the Eurozone led to a 40% increase on trade flows, suggesting that currency unions can add 40 per cent to trade between partners. Muscattelli argues that about 40 per cent of rest of UK trade to Scotland is worth about £24bn on an export basis, and £19bn on an import basis using 2012 experimental statistics from the Scottish government. These are not trivial numbers. In 2012 the UK as a whole exported £150bn of goods and services to and imported £205bn from the EU. Even if some of this trade is diverted to other countries rather than destroyed that adjustment process will take time and will be painful to businesses and consumers.

However, MacDonald (2014b) argues that the transaction cost estimates for rUK business are greatly overplayed, since post-independence sterling as a currency will dominate a new Scottish currency and UK business would simply continue to invoice in sterling, since it has reserve currency status, passing the burden all of the burden of exchange costs on to the Scottish public. (For example, in excess of 90 per cent of US imports and exports are priced in US dollars, the leading reserve currency.) MacDonald also notes that the 40 per cent trade effect is a result for the Eurozone currency area, which Muscattelli (2014a) argues is not a good comparator to the UK

situation. Indeed, as I understand it, the study from which these results are drawn extracts a separate effect for the sterling zone area and for this trade effects “hardly change”.

As we shall see below even if we take the 0.1 to 0.5 per cent costs at face value, it is unquestionable that the costs, both to the UK and to Scotland, of a sterling zone crisis are some large multiple of 1 per cent, rather than a fraction, as the recent financial crisis has illustrated. Since a post-independent Scotland would face asymmetric oil shocks vis-à-vis the UK, such a sterling zone crisis would be inevitable. It is also worth emphasising, and as HMT (2014) make clear, competitiveness in a post independence monetary union is likely to be as volatile as having an independent currency as the real exchange rate has to take the full brunt of the adjustment and therefore overshoots. Of course the great advantage of having a separate currency is that you can avoid the inevitable costs of a currency crisis to which we now turn.

8. Costs of a Post-independence Currency Crisis

The International Monetary Fund have usefully quantified the effects of a currency crisis on a country’s economic output. Specifically Balakrishnan, Brooks, Leigh and Tytell (2009) identify a currency crisis using the methods of Milesi-Ferretti and Razin (1998) which requires three conditions to hold for a currency crisis: a minimum of 15 per cent of nominal exchange rate depreciation against the US dollar; a minimum 10 per cent increase in the rate of depreciation with respect to the previous year; and a rate of depreciation of below 10 percentage points in the previous year

The sample used by Balakrishnan et al includes 88 banking crises and 222 currency crisis and these are distributed across high-, middle-, and low-income economies, with the sample period spanning 1970 – 2002. This is a very large an encompassing sample. They then compute the medium term output loss for each episode and specifically, they measure the output loss associated with a crisis as the difference between the actual level of output that would have been expected based on the prevailing pre-crisis trend. In order to focus on the medium term, the post-crisis window is taken to be seven years and the output loss associated with a crisis is taken to be the difference between the actual level of output and the level that would have been expected based on the pre-crisis trend.⁵ The actual level of output is measured as the logarithm of real GDP per capita.

In order to apply this to a potentially independent Scotland, and the currency crisis that would inevitably ensue if Scotland were to maintain the sterling zone relationship, post-independence we assume a range of growth scenarios between no growth (zero) and three per cent. Assuming a GDP level that includes offshore oil revenue of £140bn, which is at the upper end of most independent researchers measure of GDP we calculate that a currency crisis would cost an independent Scotland between £25 - £30bn. However, these results are based on an ‘average’ currency crisis which for the sample of currencies referred to would be a much milder crisis than that involved in the break up of a currency union. For the latter a figure of up to £100bn would be consistent with the numbers in Balakrishnan et al.

⁵ To capture the pre-crisis trend they use a linear trend through the actual output series although alternative methods are used as a robustness check

Of course most currency crisis also lead to a banking crisis or indeed a banking crisis can lead to a currency crisis (see, for example, Laeven and Valencia (2012)). Balakrishnan et al also use the same panel data set noted above to calculate the costs of a banking crisis and show that output falls by 10% on average for each of at least 10 years. If this were inputed into the Scottish case it would add at least an extra £100bn to the £25-30bn range noted above.

Conclusions.

In this paper we have revisited the currency options available to an independent Scotland in the light of the various key papers that have been written on the subject. Our view remains as in MacDonald (2013) that the only feasible option for an independent Scotland is to have a new currency with a separate central bank and regulatory framework. No other option will be credible to financial markets.

The so-called Plan A of the Scottish Government, the continuation of a formal sterling monetary union post-independence, is fundamentally flawed for two reasons. The first is that in becoming a sovereign state an independent Scotland relinquishes the automatic fiscal insurance mechanism that is in place in a political and monetary union. So in the face of economic shocks, and particularly asymmetric shocks, such as oil price changes, a painful internal adjustment process would have to take place on each occasion, with wage and price falls and rising unemployment as the variables that would adjust. Such adjustment would be unacceptable to the people of Scotland, even if they had access to bail out funds from, say, the International Monetary Fund. It is clearly much easier to make such shocks in an independent nation if you have some flexibility in your nominal exchange rate.

The second reason that the Plan A is flawed is related to the first. For a monetary union to work in the absence of a political union it is now widely accepted that you have to have both a banking union and fiscal union and one of the Scottish Government's advisors, Prof Joe Stiglitz, has made that clear in a recent interview. The Scottish Government, however, have made clear that they want to have 100% control over fiscal policy and therefore do not accept that a fiscal union is needed. It is abundantly clear that rUK taxpayers are not going to bale out a Scottish Government who do not sign up to such a fiscal union.

However, as I and others have made clear, even if a formal monetary union could be agreed between Scotland and rUK it is still doomed to fail because of the asymmetric oil shocks that would be an ever present reality of an independent Scotland. Given the large debt burden an independent Scotland is likely to inherit, and given the forward looking nature of financial markets, the collapse of a formal sterling zone will happen sooner than later. At the time of writing there is considerable turmoil in financial markets due to the narrowing of the polls between 'Yes' and 'No' sides. Multiply that turbulence by one hundred or a thousand fold and you have some idea of the financial meltdown that would inevitably occur if a formal currency union were to be set up.

We have also exploded two other myths about a formal currency arrangement. The first is that it would give Scottish business a certain platform in which to trade with its main trading partner, rUK. Because Scotland's real exchange rate, or competitiveness, will be changing independently of nominal exchange rates post independence, and because that competitiveness is driven by volatile oil prices, there will be much

volatility in Scotland's real exchange rate, even in a monetary union. This as we have seen will be exacerbated by the inflation targeting of the Bank of England. So there is no gain to Scottish business in terms of removing exchange rate uncertainty and risk in a currency union. Furthermore, given the high level of development of an independent Scotland, its sophisticated financial sector and other sectors sophisticated trade linkages, there will be a need to build up a substantial balance of foreign exchange reserves for the day when the monetary union ends, which it inevitably will. To build up such reserves will require a significant austerity programme which would be needed in any case in the light of the debt overhang to build up a 'hard currency'.

Adopting the pound anyway is without doubt the worst possible currency option for an independent Scotland. This would have all of the issues relating to competitiveness noted above, there would be no lender of last resort function available to the financial sector, which would simply move south of the border producing a much larger deficit in an independent Scotland's balance of payments (since the financial sector comprises 15% of Scotland's exports and is a substantial positive contributor to net factor payments). An independent Scotland would also be unable to control the money supply in the sterlingisation option as this would be governed by inflows and outflows through the balance of payments. Indeed, to try to smooth these flows a large sum of foreign exchange reserves would need to be accumulated and this could only be done by running fiscal surpluses year-on-year.

Joining the Euro is also ruled out for a number of reasons. First, an independent Scotland would not meet the necessary criteria for joining the Euro zone. Second, the Euro zone is a one sized fits all monetary policy comprising a group of net importers of hydrocarbons; Scotland's oil asymmetric oil shocks would open it to the kind of competitiveness issues discussed above for the Sterling monetary union. Third, Scotland would have to have its own central bank and bank regulatory mechanisms in place and presumably its own currency before it could join. Fourth, since over 70% of Scotland trade is with the rUK, capricious movements in the Euro could have a very deleterious effect on that trade.

This leaves a separate currency as the only economically sound option for an independent Scotland. It is the only option that financial markets will find credible. As we have made clear in this paper, a separate currency is a perfectly feasible option for an independent Scotland. However, as we have also made clear any foreign exchange rate mechanism needs reserves to run it, particularly for a country of Scotland's financial sophistication. Given an independent Scotland would not have a healthy balance of payments position, especially if its banking sector relocates south of the border, these reserves would need to be built up over time by having some form of austerity programme, as it would simply not be feasible to borrow the kind of sums of money needed on capital markets. In the meantime an independent Scotland would have to run pretty much a purely floating exchange rate system and this would be one in which the floating Scots pound would be volatile with possible knock on effects for Scottish trade and investment. However, as we have argued such volatility in competitiveness would exist in the formal currency union case as well, so this is not an extra cost of a separate currency. The huge benefit of course of a separate currency is that it offers an independent Scotland an external adjustment mechanism in the face of the economic shocks that it will inevitably face. This is clearly a superior

adjustment mechanism to the internal adjustment mechanism that countries in the Eurozone have recently been forced to employ.

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