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This paper will examine monetary policy appropriate for an open economy operating with a floating exchange rate. It will be shown that most of the conventional wisdom regarding each of the following issues is flawed: interest rate determination; ability of the central bank to "pump liquidity" into an economy to fight deflation; central bank "monetization" of budget deficits; central bank "sterilization"; the relation between the "twin deficits" and their impacts on exchange rates.

Briefly, the central bank sets the overnight interest rate target and then supplies or drains reserves to ensure banks have the quantity desired and/or required. The central bank can always "pump" excess reserves into the system, but this will simply result in a zero-bid condition in the overnight market, causing overnight rates to fall to zero (or to the support rate if the central bank pays interest on reserves). The treasury spends by crediting bank accounts and taxes by debiting them—deficits simply mean that bank accounts have been net-credited, hence, reserves have increased. If this has created a position of excess reserves, the central bank or treasury must sell bonds or the overnight rate will fall. Hence, there is no operational meaning to be attached to the notion of central bank "monetization" of deficits.

Central bank operations are always defensive, and if international payments cause actual reserves to deviate from desired/required reserve positions, the central bank has no choice but to "sterilize" (accommodate) by supplying or draining reserves if it has a non-zero overnight rate target. While it is supposed that budget deficits raise interest rates and thereby cause currency appreciation and hence the "twin" trade deficit, in reality budget deficits create excess reserve positions that would lower overnight interest rates if bond sales were not undertaken. Hence, any correlation between budget deficits and trade deficits is more likely to arise from the stimulative effect of budget deficits on non-government sector spending.

Finally, it is commonly believed that the central bank should take actions to affect exchange rates to manipulate trade balances. We will argue this results mostly from a misunderstanding of the costs and benefits of trade and of the process of "financing" trade deficits. Our analysis will support floating rates and offer an alternative view of the finance process.

Throughout the following exposition, it will be necessary to keep in mind that all of the arguments are predicated on the assumption that we are analyzing a country with a sovereign currency on a floating exchange rate—that is, a country like the UK, Japan, or the US. Some of the arguments would have to be revised for the case of a European nation operating with the Euro (which is in some respects a "foreign" currency from the

perspective of the individual member states); the modifications would likely be even greater for a nation operating with a fixed exchange rate or currency board.

INTEREST RATE DETERMINATION

A few years ago, textbooks had traditionally presented monetary policy as a choice between targeting the quantity of money or the interest rate. It was supposed that control of monetary aggregates could be achieved through control over the quantity of reserves, given a relatively stable "money multiplier". (Brunner 1968; Balbach 1981) This even led to some real world attempts to hit monetary growth targets—particularly in the US and the UK during the early 1980s. However, the results proved to be so dismal that almost all economists have come to the conclusion that at least in practice, it is not possible to hit money targets. (B. Friedman 1988) These real world results appear to have validated the arguments of those like Goodhart (1989) in the UK and Moore (1988) in the US that central banks have no choice but to set an interest rate target and then accommodate the demand for reserves at that target. Hence, *if* the central bank can indeed hit a reserve target, it does so only through its decision to raise or lower the interest rate to lower or raise the demand for reserves. Thus, the supply of reserves is best thought of as wholly accommodating the demand, but at the central bank's interest rate target.

Why does the central bank necessarily accommodate the demand for reserves? There are at least four different answers. In the US, banks are required to hold reserves as a ratio against deposits, according to a fairly complex calculation. In the 1980s, the method used was changed from lagged to contemporaneous reserve accounting on the belief that this would tighten central bank control over loan and deposit expansion. As it turns out, however, both methods result in a backward looking reserve requirement: the reserves that must be held today depend to a greater or lesser degree on deposits held in the fairly distant past. As banks cannot go backward in time, there is nothing they can do about historical deposits. Even if a short settlement period is provided to meet reserve requirements, the required portfolio adjustment could be too great—especially when one considers that many bank assets are not liquid. Hence, in practice, the central bank automatically provides an overdraft—the only question is over the "price", that is, the discount rate charged on reserves. In many nations, such as Canada and Australia, the promise of an overdraft is explicitly given, hence, there can be no question about central bank accommodation.

A second, less satisfying, answer is often given, which is that the central bank must operate as a lender of last resort, meaning that it provides reserves in order to preserve stability of the financial system. The problem with this explanation is that while it is undoubtedly true, it applies to a different time dimension. The central bank accommodates the demand for reserves day-by-day, even hour-by-hour. It would presumably take some time before refusal to accommodate the demand for reserves would be likely to generate the conditions in which bank runs and financial crises begin to occur. Once these occurred, the central bank would surely enter as a lender of last resort, but this is a different matter from the daily "horizontal" accommodation.

The third explanation is that the central bank accommodates reserve demand in order to ensure an orderly payments system. This might be seen as being closely related to the lender of last resort argument, but I think it can be more plausibly applied to the time frame over which accommodation takes place. Par clearing among banks, and more importantly par clearing with the government, requires that banks have access to reserves for clearing. (Note that deposit insurance ultimately makes the government responsible for check clearing, in any event.)

The final argument is that because the demand for reserves is highly inelastic, and because the private sector cannot increase the supply, the overnight interest rate would be highly unstable without central bank accommodation. Hence, relative stability of overnight rates requires "horizontal" accommodation by the central bank. In practice, empirical evidence of relatively stable overnight interest rates over even very short periods of time supports the belief that the central bank *is* accommodating *horizontally*.

We can conclude that the overnight rate is exogenously administered by the central bank. Short-term sovereign debt is a very good substitute asset for overnight reserve lending, hence, its interest rate will closely track the overnight interbank rate. Longer-term sovereign rates will depend on expectations of future short term rates, largely determined by expectations of future monetary policy targets. Thus, we can take those to be mostly controlled by the central bank as well, as it could announce targets far into future and thereby affect the spectrum of rates on sovereign debt.

PUMPING LIQUIDITY TO FIGHT DEFLATION

In recent years there have been numerous calls on the central banks to "pump" liquidity into the system to fight deflationary pressures, first in Japan and more recently in the US. (Bernanke 2003) Years ago, Friedman (1969) had joked about helicopters dropping bags of money as a way to increase the money supply. If this practice were adopted, it probably would be an effective means of reversing deflationary pressures—if a sufficient number of bags were dropped. There are two problems with such a policy recommendation, however. First, of course, no central bank would even consider such a policy. Second, and more importantly, this would not really be a monetary policy operation, but rather a fiscal policy operation akin to welfare spending. In practice, central banks are more-or-less limited to providing reserves at the discount window or in open market operations. In both cases, the central bank increases its liabilities (reserves) and gains an asset (mostly sovereign debt or private bank liabilities, although the central bank could also buy gold, foreign currencies, and other private assets). Helicopter money drops are quite different because they increase private sector wealth; in contrast central bank operations do not (except to the extent that adoption of a lower interest rate target increases prices of financial assets).

From the previous section, it should be clear that the central bank cannot choose to increase reserves beyond the level desired/required by the banking system if it wishes to maintain positive overnight rates. If private banks have all the reserves they need/want, then they will not borrow more from the central bank. Open market purchases would

simply result in excess reserve holdings; banks with excessive reserves would offer them in the overnight market, causing the interbank interest rate to decline. Once the overnight rate reached the bottom of the central bank's target range, an open market sale would be triggered to drain excess reserves. This would return the overnight rate to the target, and the central bank would find that it had drained an amount of reserves more-or-less equivalent to the reserves it had "pumped" into the system to fight deflation. Fortunately, no central bank with a positive overnight interest rate target would be so foolish as to follow the advice that they ought to "pump liquidity" to fight deflation.

Japan presents a somewhat different case, because it operates with a zero overnight rate target. This is maintained by keeping some excess reserves in the banking system. The Bank of Japan can always add more excess reserves to the system since it is satisfied with a zero rate. However, from the perspective of banks, all that "pumping liquidity" into the system means is that they hold more non-earning reserves and fewer low-earning sovereign bills and bonds. There is no reason to believe that this helps to fight deflation, and Japan's long experience with zero overnight rates even in the presence of deflation provides empirical evidence that even where "pumping liquidity" is possible, it has no discernible positive impact. (The US had a similar experience with discount rates at 1% during the Great Depression.) And, to repeat, "pumping liquidity" is not even a policy option for any nation that operates with positive overnight rates.

Can the central bank do anything about deflation? As the overnight interest rate is a policy variable, the central bank is free to adjust the target to fight deflation. However, both theory and empirical evidence provide ambiguous advice, at best. It is commonly believed that a lower interest rate target will stimulate private borrowing and spending—although many years of zero rates in Japan with chronic deflation provide counter evidence. There is little empirical evidence in support of the common belief that low rates stimulate investment. This could be for a variety of reasons: the central bank can lower the overnight rate, but the relevant longer-term rates are more difficult to reduce; most evidence suggests that investment is interest-inelastic; and in a downturn, the expected returns to investment fall farther and faster than market interest rates can be brought down.

Evidence is more conclusive regarding effects of low rates on housing and consumer durables; indeed, recent lower mortgage rates in the US have undoubtedly spurred a refinancing boom that fueled spending on home remodeling and consumer purchases. Still, this effect must run its course once all the potentially refinanceable mortgages are turned-over. Further, it must be remembered that for every payment of interest there is an interest receipt. Lower rates reduce interest income. It is generally assumed that debtors have higher spending propensities than creditors, hence, the net effect is presumed to be positive. As populations age, it is probable that a greater proportion of the "rentier" class is retired and at least somewhat dependent upon interest income. This could reverse those marginal propensities.

More importantly, if national government debt is a large proportion of outstanding debt, and if the government debt to GDP ratio is sufficiently high, the net effect of interest rate

reductions could well be deflationary. This is because the reduction of interest income provided by government could reduce private spending more than lower rates stimulated private sector borrowing. In sum, the central bank can lower overnight rate targets to fight deflation, but it is not clear that this will have a significant effect.

'MONETIZATION' OF BUDGET DEFICITS

It is commonly believed that government faces a budget constraint according to which its spending must be "financed" by taxes, borrowing (bond sales), or "money creation". Since many modern economies actually prohibit direct "money creation" by the government's treasury, it is supposed that the last option is possible only through complicity of the central bank—which could buy the government's bonds, and hence finance deficit spending by "printing money".

Actually, in a floating rate regime, the government that issues the currency spends by crediting bank accounts. Tax payments result in debits to bank accounts. Deficit spending by government takes the form of net credits to bank accounts. Operationally, the entities receiving net payments from government hold banking system liabilities while banks hold reserves in the form of central bank liabilities (we can ignore leakages from deposits—and reserves—into cash held by the non-bank public as a simple complication that changes nothing of substance). While many economists find the coordinating activities between the central bank and the treasury quite confusing. I want to leave those issues mostly to the side and simply proceed from the logical point that deficit spending by the treasury results in net credits to banking system reserves, and that these fiscal operations can be huge. (See Bell 2000, Bell and Wray 2003, and Wray 2003/4)

If these net credits lead to excess reserve positions, overnight interest rates will be bid down by banks offering the excess in the overnight interbank lending market. Unless the central bank is operating with a zero interest rate target, declining overnight rates trigger open market bond sales to drain excess reserves. Hence, on a day-to-day basis, the central bank intervenes to offset undesired impacts of fiscal policy on reserves when they cause the overnight rate to move away from target. The process operates in reverse if the treasury runs a surplus, which results in net debits of reserves from the banking system and puts upward pressure on overnight rates—relieved by open market purchases. If fiscal policy were biased to run deficits (or surpluses) on a sustained basis, the central bank would run out of bonds to sell (or would accumulate too many bonds, offset on its balance sheet by a treasury deposit exceeding operating limits). Hence, policy is coordinated between the central bank and the treasury to ensure that the treasury will begin to issue new securities as it runs deficits (or retire old issues in the case of a budget surplus). Again, these coordinating activities can be varied and complicated, but they are not important to our analysis here. When all is said and done, a budget deficit that creates excess reserves leads to bond sales by the central bank (open market) and the treasury (new issues) to drain all excess reserves; a budget surplus causes the reverse to take place when the banking system is short of reserves.

Bond sales (or purchases) by the treasury and central bank are, then, ultimately triggered by deviation of reserves from the position desired (or required) by the banking system, which causes the overnight rate to move away from target (if the target is above zero). Bond sales by either the central bank or the treasury are properly seen as part of monetary policy designed to allow the central bank to hit its target. This target is exogenously "administered" by the central bank. Obviously, the central bank sets its target as a result of its belief about the impact of this rate on a range of economic variables that are included in its policy objectives. In other words, setting of this rate "exogenously" does not imply that the central bank is oblivious to economic and political constraints it believes to reign (whether these constraints and relationships actually exist is a different matter).

In conclusion, the notion of a "government budget constraint" only applies ex post, as a statement of an identity that has no significance as an economic constraint. When all is said and done, it is certainly true that any increase of government spending will be matched by an increase of taxes, an increase of high powered money (reserves and cash), and/or an increase of sovereign debt held. But this does not mean that taxes or bonds actually "financed" the government spending. Government might well enact provisions that dictate relations between changes to spending and changes to taxes revenues (a balanced budget, for example); it might require that bonds are issued before deficit spending actually takes place; it might require that the treasury have "money in the bank" (deposits at the central bank) before it can cut a check; and so on. These provisions might constrain government's ability to spend at the desired level. Belief that these provisions are "right" and "just" and even "necessary" can make them politically popular and difficult to overturn. However, economic analysis shows that they are self-imposed and are not economically necessary—although they may well be politically necessary. From the vantage point of economic analysis, government can spend by crediting accounts in private banks, creating banking system reserves. Any number of operating procedures can be adopted to allow this to occur even in a system in which responsibilities are sharply divided between a central bank and a treasury. For example, in the US, complex procedures have been adopted to ensure that treasury can spend by cutting checks; that treasury checks never "bounce"; that deficit spending by treasury leads to net credits to banking system reserves; and that excess reserves are drained through new issues by treasury and open market sales by the Fed. That this all operates exceedingly smoothly is evidenced by a relatively stable overnight interbank interest rate—even with rather wild fluctuations of the Treasury's budget positions. If there were significant hitches in these operations, the fed funds rate would be unstable.

CENTRAL BANK STERILIZATION

There is a great deal of confusion over international "flows" of currency, reserves, and finance, much of which results from failure to distinguish between a floating versus a fixed exchange rate. For example, it is often claimed that the US needs "foreign savings" in order to "finance" its persistent trade deficit that results from "profligate US consumers" who are said to be "living beyond their means". Such a statement makes no sense for a sovereign nation operating on a flexible exchange rate. In a nation like the US,

when viewed from the vantage point of the economy as a whole, a trade deficit results when the rest of the world (ROW) wishes to net save in the form of dollar assets. The ROW exports to the US reflect the "cost" imposed on citizens of the ROW to obtain the "benefit" of accumulating dollar denominated assets. From the perspective of America as a whole, the "net benefit" of the trade deficit consists of the net imports that are enjoyed. In contrast to the conventional view, it is more revealing to think of the US trade deficit as "financing" the net dollar saving of the ROW—rather than thinking of the ROW as "financing" the US trade deficit. If and when the ROW decides it has a sufficient stock of dollar assets, the US trade deficit will disappear.

It is sometimes argued that when the US experiences a capital account surplus, the dollars "flowing in" will increase private bank reserves and hence can lead to an expansion of private loan-and-deposit-making activity through the "money multiplier". However, if the Fed "sterilizes" this inflow through open market sales, the expansionary benefits are dissipated. Hence, if the central bank can be persuaded to avoid this sterilization, the US can enjoy the stimulative effects.

Previous analysis should make it clear that sterilization is not a discretionary activity. First it is necessary to understand that a trade deficit mostly shifts ownership of dollar deposits from a domestic account holder to a nonresident account holder. Often, reserves do not even shift banks as deposits are transferred from an account at a US branch to an account at a foreign branch of the same bank. Even if reserves are shifted, this merely means that the Fed debits the accounts of one bank and credits the accounts of another. These operations will be tallied as a deficit on current account and a surplus on capital account. If treasury or central bank actions result in excess reserve holdings (by the foreign branch or bank), the holder will seek earning dollar-denominated assets—perhaps US sovereign debt. US bond dealers or US banks can exchange sovereign debt for reserve deposits at the Fed. If the net result of these operations is to create excess dollar reserves, there will be downward pressure in the US overnight interbank lending rate. From the analysis above, it will be obvious that this is relieved by central bank open market sales to drain the excess reserves. This "sterilization" is not discretionary if the central bank wishes to maintain a positive overnight rate target. Conversely, if the net impact of international operations is to result in a deficit dollar reserve position, the Fed will engage in an open market purchase to inject reserves and thereby relieve upward pressure that threatens to move the overnight rate above target.

THE TWIN DEFICITS AND FOREIGN EXCHANGE RATES

During the mid 1980s it was argued that the US federal budget deficit caused a trade deficit. The transmission mechanism from budget deficit to trade deficit was supposed to operate through interest rates and dollar appreciation. First, borrowing by government was supposed to have raised domestic interest rates as the budget deficit "soaked up" domestic saving. Rising interest rates increased the foreign demand for the dollar, causing dollar appreciation, thus generating a trade deficit. Further, maintenance of high interest rates would be necessary to maintain the "capital flow" required to finance the trade

deficit and the budget deficit, depressing long-term economic growth. Again, the understanding developed in previous sections allows us to critically examine such claims.

First, budget deficits do not "absorb" private saving and do not put upward pressure on interest rates (and crowd out private spending). Indeed, in the absence of central bank intervention (to drain excess reserves), a budget deficit places downward pressure on overnight rates because it leads to a net credit of banking system reserves. As already discussed, a sovereign nation on a floating rate does not really "borrow", hence, cannot absorb private saving when it deficit spends. Rather, deficits allow for positive net saving by the non-government sector. This is initially in the form of net credits to banking system reserves, but sovereign debt will be sold to drain excess reserves (either sold by the Fed in open market operations or by the Treasury in the new issue market). If a budget deficit is associated with rising overnight rates, this is only because the central bank has decided to raise its overnight interest rate target—a not infrequent, but discretionary, response to budget deficits.

Second, the effect of budget deficits on the foreign exchange value of the domestic currency is not unambiguous. If budget deficits allow the domestic economy to grow faster than the ROW, it is possible that a trade deficit will result and this could lower exchange rates. (Thirlwall's Law states that if price elasticities are small enough so that substitution effects can be ignored, then a country's growth rate relative to that of the rest of the world cannot exceed the ratio of the relevant income elasticities of demand without creating a balance of payment deficit. See Davidson 1994.) However, this depends on the relative foreign demand for dollar-denominated assets. Expectations can play a role: if it is believed that a budget deficit will induce the central bank to raise interest rates, then the currency could appreciate in anticipation of future central bank action. Note that there is little evidence to support the common belief that exchange rates are affected by central bank interest rate targets, by budget deficits, or by trade balances; indeed, the Japanese Yen has risen and fallen substantially with constant, zero, interest rates and persistent trade surpluses and budget deficits, while the American dollar rose with the budget surplus and then fell as the budget moved sharply to deficit—all in the face of a persistent trade deficit that did not fluctuate nearly so much as the budget balance.

It appears that the most likely transmission mechanism from a budget deficit to a trade deficit operates through the positive impact a fiscal relaxation can have on economic growth. Even if one believed that a trade deficit is "bad", this does not necessarily indicate that a budget deficit and economic growth should be foregone to avoid a trade deficit. Further, if one sees a trade deficit as a "benefit" to the domestic economy, it becomes even harder to argue that policy should be geared toward avoiding a trade deficit. Finally, if one understands that a trade deficit results from a ROW desire to accumulate net savings in the form of assets denominated in the currency of the net importer, one has a different view of the "financing" of the trade deficit. In this case, it is not necessary to avoid budget deficits or to keep domestic interest rates high, or to keep the exchange rate up, all in order to attract "foreign financing" of the trade deficit. Rather, a trade deficit should be seen as the mechanism that "finances" the ROW desire to net save in dollar assets.

There is, thus, a symmetry to the "twin deficits", although it is not the connection that is usually made between the two. A government budget deficit occurs when the nongovernment sector desires to net save in the form of sovereign debt (broadly defined to include both interest-paying bills and bonds as well as non-interest earning currency and reserves). A current account deficit occurs when the ROW wants to net save dollar-denominated assets, including dollar-denominated sovereign debt. The common view that this net saving of the non-government and ROW sectors, respectively, "finances" the government and trade deficits, respectively, has confused an identity with causation.

There has recently been a great deal of concern over the possibility of a collapse of the dollar, occasioned by persistent and even growing US trade deficits. This is unlikely. Much of the world looks to the US as the primary market for excess production. A large number of countries have adopted currency boards based on the dollar or operate exchange rate pegs to the dollar. Such nations have an almost insatiable demand for dollars as reserves against their currencies. Private and public portfolios around the world are heavily weighted to dollar assets. Private and public borrowers have contractual commitments in dollars. Those who argue that a sudden global sale of dollars could lead to a collapse do not appear to take these factors into account. Of course, this does not mean that the dollar cannot fall relative to one or more currencies—as it did until recently, and as is the nature of a floating currency.

SMALL OPEN ECONOMIES

This is probably not too controversial for most economists. The US dollar is seen as a "special case", with perhaps a handful of other hard currencies in a similar situation. What about the world's other floating currencies? Surely small open economies like Australia and Canada must manage their government budgets and trade accounts to keep up the value of their currencies? It is probably true that trade deficits and budget deficits have impacts on currency values; it appears to be less certain that the interest rate targets of monetary authorities have predictable effects on exchange rates. Assuming that budget and trade deficits do lead to devaluation of a currency, the question is whether policy ought to try to avoid this. Recall from above that a trade deficit means the ROW wants to net save domestic currency assets, and that the real national cost of enjoying imports consists of the exports that must be delivered. As a trade deficit increases, the per unit real cost of imports is declining in the sense that relatively fewer exports have been demanded by the ROW per unit of import. Even if this is accompanied by depreciation of the currency, net real benefits have increased. This is not to deny that depreciation of the currency can impose real and financial costs on individuals and sectors of the economy. Domestic policy can and probably should be used to relieve these individual and sectoral costs. However, using policy to prevent trade deficits in order to forestall currency depreciation means foregoing the net real benefits.

Let us take the worst case—a small open economy subject to Thirlwall Law constraints and where Marshall-Lerner conditions do not hold. In other words, this country's price elasticity of demand for imports is quite low, such that its sum with the price elasticity of demand by the ROW for its exports is less than unity. (Davidson 1994) In addition, the

country's income elasticity of demand for imports is high so that unless it grows substantially slower than the ROW a trade deficit results. Further, it is a price taker in international markets and its scale of production and demand are so low that it has no impact on international prices. Finally, let us assume that a trade deficit causes its currency to depreciate—but price elasticities are such that depreciation will not wipe out the deficit.

When the country begins to grow, a trade imbalance results. Before its currency depreciates, it clearly enjoys an improvement in its terms of trade—as its exports have not changed but its imports have risen. As its currency depreciates, import prices rise in terms of its currency. (This will have an additional impact on the home-currency denominated trade deficit, which, by assumption, can cause additional depreciation.) In addition, assuming competitive markets, the home currency prices of all the commodities it exports also rise. The foreign currency prices of import and export commodities, however, are not affected. By assumption, rising domestic currency prices of imports do not affect purchases of imports, and exports are not affected because foreign currency prices have not changed. So depreciation does not directly affect the improved terms of trade. If rising prices of the types of commodities exported do reduce domestic purchases of these, more are available for export—which could reduce the trade deficit and worsen the terms of trade somewhat. However, when all is said and done, the country has experienced economic growth and improved terms of trade (if not, there would be no currency depreciation). On the other hand, the currency depreciation will cause imports to rise in price and will directly increase domestic prices of exported commodities and there could be further price effects rippling through the economy. The "cost" of the trade deficit, economic growth, and improved terms of trade is higher prices for some commodities in the consumer basket. Of course, many would also point to the "financing" costs of the trade deficit, itself, and the "burden" of rising external indebtedness—an argument covered in the next section.

BURDEN OF THE DEBT

One of the primary arguments against running "twin deficits" is the belief that this burdens the nation by increasing indebtedness. In large part, this belief results from a confusion of a fixed exchange rate system with a floating rate system. If a nation operates with a gold standard, a government deficit commits the government to delivery of gold—a true "debt burden". However, with a floating rate "fiat" money, government only promises to service its debts by delivering "fiat" money. This does not mean that a government deficit can never be too big—inflationary—but it does mean that deficits do not "burden" government in the usual sense of the term. Nor do deficits "burden" current or future tax payers; rather, as discussed above, deficits allow the nongovernment sector (including foreigners) to net save.

Another claim frequently made is that trade deficits lead to national indebtedness, that represents a national burden—perhaps one to be "paid off" by future generations. Here, the problem is that analysis begins at too high a level. We need to examine the process of

"financing" imports in more detail, distinguishing between purchases of foreign-produced goods and services by government and by private importers.

Within any sovereign nation that operates with a domestic currency and a floating rate regime, only the State has the power to impose tax liabilities. This is a critical component of sovereign power—although by no means is it the only power claimed by the sovereign. By imposing taxes, the State can move resources to itself. All modern States rely heavily on a monetary system, first imposing taxes to create a demand for the currency, then issuing the currency to buy desired resources. All other economic agents in the sovereign nation must use income or issue debt or rely on charitable giving (including that of the State) or engage in petty production to obtain resources. No other economic agent can issue liabilities that represent final means of payment for itself.

When a US non-sovereign consumer purchases an imported Toyota, she either gives up income or sells an asset or issues a liability to finance the purchase. The Japanese exporter holds a dollar claim on a US bank that will probably be converted to a yen claim on a Japanese bank, which in turn will convert a dollar reserve to a yen reserve at the Bank of Japan (although total yen reserves at the Bank of Japan will rise only if required/desired reserves rise—otherwise, the BOJ "sterilizes" or "accommodates" by an offsetting action). Alternatively, the Japanese bank could keep dollar reserves, or could convert them to US Treasury debt—which is essentially just interest-earning reserves. When all is said and done, the American holds a new auto, and she used her income, or sold an asset, or committed herself to payments on debt. As economists are fond of saying, there is no free lunch for the individual consumer—and a trade deficit can be associated with rising indebtedness of consumers. However, increased American purchases of domestically produced output have exactly the same result, as they are financed in exactly the same way: consumer debt can rise.

By contrast, if the US government chooses to import a Toyota, it truly can "get something for nothing"—issuing dollar reserves that eventually find their way to the Bank of Japan. Is this due to "dollar hegemony"? Any sovereign State obtains "something for nothing" by imposing a tax liability and then issuing the currency used by those with tax liabilities to meet the obligation. The only difference in our example is that the US government has obtained output produced outside the US, by those who are not subject to its sovereign power—in other words, by those not subject to US taxes. However, even within any nation there can be individuals who avoid and evade taxes imposed by the sovereign power, but who are still willing to offer their output to obtain the sovereign's currency. Why? Because those who are not able to avoid and evade taxes need the currency, hence, are willing to offer their own output to obtain the currency. The US dollar has value outside the US because US taxpayers need the currency. By this I do not mean to imply that US currency is only used to pay taxes, or that those who hold US currency or reserve deposits at the Fed do so on the knowledge that US taxpayers want high powered money to pay taxes. Analytically, however, it is the taxing power of the US government that allows it to issue currency and reserves that are demanded domestically and abroad.

SEIGNIORAGE AND HEGEMONIC POWER VERSUS SOVEREIGNTY AND FLOATING RATES

The question is whether the US government is alone in its ability to issue sovereign currency accepted by those who are not subject to the sovereign's taxes. Obviously, it is not—other sovereign States operating on a floating rate regime and with a domestic currency are able to obtain the same "seigniorage income" that the US government can obtain. And, just as in the case of the US, the ability to obtain "seigniorage income" is at bottom related to ability to impose taxes in the domestic currency—only the State has this power. Surely this cannot be controversial. Even the government of a small open economy can purchase imports using its own currency. Still, it can be argued that the US reaps far more "seigniorage income" than other nations, because dollar reserves (including US Treasury debt) relative to the size of the US economy are larger than the relative size of foreign holdings of sovereign debt for many other nations. Here we should distinguish between sovereign purchases and non-sovereign purchases. While "seigniorage income" is sometimes equated to the total quantity of net imports, as we have shown above imports purchased by the non-sovereign population do not provide any "free lunch" to those individual consumers. It is only the portion of a trade deficit that is due to sovereign purchases that can be said to provide a free lunch and seigniorage income. (Still, as discussed above, the US as a whole does receive net benefits from a trade deficit, in the "real" sense that it provides fewer goods and services than it receives. This is true for any nation that runs a trade deficit. So, one could see the entire trade deficit as a source of national seigniorage income, even though private purchases do not provide free lunches to individuals.)

The remaining question is whether this results from US hegemonic power, or does it result mostly from self-imposed rules adopted by other nations. ROW preference for dollars is probably due, in part, to the sheer size of the US economy. However, the desire to hold dollar reserves could never be satisfied if the US did not run trade deficits (particularly given the low levels of official aid offered by the US). US trade deficits, in turn, require that the rest of the world, taken as a whole, desires to sell more output to the US than it is willing to buy from the US. Given the rest of the world's desire to accumulate dollar reserves and its lack of desire to consume US output, the US is "forced" to reap "seigniorage income" (again, with the caveat that strictly speaking, only sovereign governments receive seigniorage, although any net importer receives net benefits). If, say, Japan and Euroland decided to pump up their economies sufficiently to eliminate their trade surpluses, they, too, would be "forced" to reap some "seigniorage income"—and US "seigniorage income" would probably decline as exports to those nations rose.

The counter argument is that only the US can run persistent trade deficits without causing exchange rate depreciation. Perhaps, but that, too, requires "two to tango". So long as the rest of the world wants more dollar reserves, the dollar will remain strong even in the presence of a US trade deficit. Under the current "rules of the game" adopted by most nations of the world, national economic success is measured by the quantity of dollar reserves accumulated—just as mercantilist nations measured success by gold inflows. Such behavior is perfectly justified for fixed exchange rate regimes, and it severely

constrains domestic fiscal (and monetary) policy in such nations. However, analysis for countries on flexible exchange rate regimes requires a "paradigmatic shift". Further, accumulating evidence demonstrates the costs of fixed exchange rate regimes—high unemployment, low economic growth, fiscal and monetary policy constraints—and the advantages of floating rate regimes.

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